

Peripato Telematikos: Walking, Cartography and Software Art

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## **Abstract**

*Peripato Telematikos* began with walking as a means to explore and investigate the places and spaces we inhabit and our relationships with them. The research asked how can peripatetic art practices inform the methodologies used by individuals to (re)present their environs and what media art practices would be suitable to support these (re)presentations? The project sought to provide ways for audiences to engage with these walks in real time through their documentation by mobile phones. In order for this to happen I created a platform for the reception and viewing of the walks as they occurred. One interpretation of what was created by the documentation of the walks was what I termed a 'subjective mapping' of place. As a result, the final viewing interface was constructed with the intent that it would support the creation and viewing of subjective mappings.

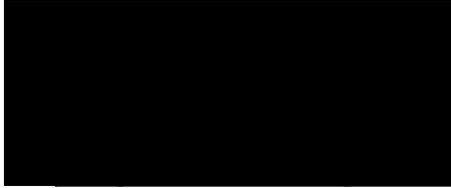
In order to understand how the different elements of walking, documentation and interface could be combined I conducted a number of planned, staged walks with groups and individuals using strategies discovered from the research into peripatetic and media art practices. This developed my understanding of how mobile phones with media capture and transmission capabilities, could be used to document the walks in real time. Media collected by the mobile phones was sent to an internet application prototype as it was collected so that the audience could engage with the walkers as the events took place. The use of mobile phones facilitated the live documentation of the walks and the infrastructure created was able to provide the technology to deliver sms and mms messages from the walkers' phone to the viewing platform. An experimental interface prototype was developed to support the spatial organisation of mapping the content and has been successfully used in many workshops, staged walks and has been presented at conferences.

This process enabled the participants to discover something new about their environs through walking, documenting, and mapping the walks. Individually, the walks contributed to an understanding of autobiography in and of a particular place.

*Peripato Telematikos* comprises a website (<http://www.peripato.net>) where the documentation of the walks can be viewed, and an exegesis that discusses the research and development of the concepts of the project.

I, Greg Giannis, declare that the PhD thesis entitled 'Peripato Telematikos: Walking, Cartography and Software Art', is no more than 30,000 words in length including quotes and exclusive of bibliography, references and endnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature



Date 18<sup>th</sup> December 2013

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## Introduction

I am a Greek-Australian artist who has a diverse practice, experimenting with many mediums and in many contexts. Past projects include photographic based work, interactive installations, public projections, net.art, participatory works, collaborations with living creatures (e.g. snails) and generative art. I have a background in software design engineering, but moved away from this in the mid 1990s to pursue my interest in art. Since then, I have exhibited and presented papers at many media art exhibitions and several festivals in Australia and overseas. A thread that recurs with my work is the utilisation of telecommunications systems and software writing to engage the public in participatory works. This research project applies artistic practice to the research and development of a multi-disciplinary telematic work to explore walking-as-art in order to create representations of place, or subjective mappings, through the integration of the mediums of cartography and the mapping of walks, software design, and media art. The research has built upon past works by combining and syncretising in order to create a work that spans disciplines and practices.

*Peripato Telematikos*, the title of this work, is a play on the words 'peripatetic' and 'telematic'. *Peripato* is the Modern Greek term for a ritual evening stroll. These walks were very strictly timed and regulated, and provided the only opportunity for some (especially young) people to socialise, or be in the wider world. *Peripatetic* has been in English since the Middle Ages. It denotes walking to and fro and connotes travelling or working (in) place-to-place, and, when capitalised, refers to the philosophy or teaching of Aristotle (OED). Aristotle aside, *peripato* seemed an appropriate term for a work that engages the world through staged walks devised by a second-generation Greek-Australian.

In this project, I sought to explore spaces through individual and collective walking. But a walking that would result in a subversive mapping. A mapping rendered from the ground up; from the embodied experiences of those that traversed the spaces represented, a means of knowing the world by being in it.

Being in the world is something that seems to evade modern man. We race around, usually in some form of fast transportation that renders the surrounds a blur. We always need to be somewhere, and what lies in between is just an obstacle. I have always resisted this disregard for the in-between, but at some

expense. I often don't know how to get from A to B if I have travelled that route as a passenger. I am usually too busy looking at the in-between, gazing out the window, trying to absorb what flies past. I am accused of having my head in the clouds, of not being attentive to the route. But I would argue that I am being attentive, not to the final destination and how to get there, but to all that is encountered on the route. Choosing walking as the medium for art /performance allows me to experience the journey and all that is encountered along the way.

From Highmore's perspective, walking allows the individual to experience the world at a rhythm which digital technology denies with its constant interruptions and breakdowns (Lavery 2009, p. 47).

The pace of walking (as opposed to cycling or driving) allows a greater engagement with the route or path and all that it entails. It allows for pauses, giving time for the body to register an internal, visceral sensation of that moving. As Massumi says 'When I think of my body and ask what it does to earn that name, two things stand out. It moves. It feels. In fact, it does both at the same time. It moves as it feels, and it feels itself moving' (Massumi 2002, p. ix). We come to know space bodily as well as through the traditional senses of sight, smell, sound and touch. The grade of the land, the texture of the path, the putrid smells of industry or intoxicating home cooking or the crisp air against our skin are all present when walking.

Walking alongside a child adds another dimension to this experience. Walks with my daughter were always slow, and full of unexpected twists and turns. They were local: to the playground, the lake, the shops or often with no particular destination in mind. Everything that caught her eye had to be examined: flowers, rubbish, insects or anything else that lay in her path. Spencer had similar experiences with his toddler, and reflects, 'what occurs to the adult walking alongside this blossoming creature is (phenomenologically speaking) a mind-blowing experience' (Spencer 2004, p. 26). I noticed things I would never have stopped for. Time became irrelevant, we were in the here and now, whilst the world raced uncontrollably around us. I learnt many things from these experiences, amongst them the simple value of the journey over the destination. Or as Slavin puts it, a journey where '[o]ne focused upon the journey and the self as opposed to the destination. This kind of walking Thoreau (1982) calls a "return to the senses"' (Slavin 2003, p. 4) and was a primary focus of the project.

Walking was conducted with groups of participants to explore the possibility that a multiplicity of viewpoints can contribute to a richer understanding of place. Strategies were employed to give voice to the participants, and to encourage the breaking of habitual behaviour by leading the walkers into unfamiliar territory. The participants in the collective walks were given a voice in the workshops by not imposing any agenda of my own.

I conducted many walks, reversing the situation described above so that rather than leading a collective through the walking, I became the sole walker. Strong personal threads of reference run through this thesis. They are not to do with autobiographical chronology, but rather with the language and geography of the spaces investigated through walking and the reminiscences they evoked. This is akin to Walter Benjamin's notion of memoirs. Benjamin differentiates between reminiscence and autobiography.

Autobiography has to do with time, whereas memoirs focus on space (places, fragments) and depth rather than continuity of experience (Benjamin, W. 1979, p. 316).

My solo walks were conducted primarily in two locations: around my home in the suburb of Reservoir, and around my ancestral home, the island of Lesbos, Greece. I endeavoured to walk routes that were not predefined, to not follow 'tracings', or traverse paths of extant knowledge. In Reservoir, this led me to follow routes of hidden urban waterways, waterways that have been subsumed by the urban infrastructure and rendered invisible in most instances. In Lesbos, the walking became connected to notions of pilgrimage and life. I walked routes that would have been traversed by my mother's ancestors, and the hinterlands of my father's village. I became immersed in the rhythms and rituals of the island people, and walked daily.

The word *telematic*<sup>1</sup>, derived from the French *telematique*, simply refers to a conjunction of computers and telecommunications systems. The walks in this project were documented in real-time using mobile phones, which transmit content recorded by the walker to a system comprising a networked computer server. The walks are documented and broadcast in this way to give an audience a glimpse of this experience, in order to capture this 'authentic moment'

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<sup>1</sup> Telematics is the English language version of the French word *telematique* -- coined by Simon Nora and Alain Minc in the book *L'informatisation de la Societe* (La Documentation Francaise, 1978); translated as *The Computerization of Society* (MIT Press, 1980).

(Abramovic et al., 1979, p. 15), a term used by Marina Abramovic in relation to the moment that an image is taken during the walks conducted by Richard Long and Hamish Fulton. This moment is broadcast in real time so that it can be witnessed as it happens and not after the event, as is usually the case with many peripatetic art works.

A major research question was: is it possible for the walker(s) to engage a geographically dispersed audience during the walks? Might it be possible to capture the 'authentic moment' using a medium that allows instant distribution from the actual location of the event? Is it possible for a remote audience to witness the 'authentic moment'? The research asked what media art practices would be suitable to support these aims? This increased my understanding of issues relating to the use of mobile phones; for example, the type of infrastructure, hardware and software needed to enable a walker to transmit media using a mobile phone whilst walking. This led to the development of an SMS/MMS gateway and the ancillary hardware and software required to implement this functionality. This required the development of a custom software/hardware system, which facilitates the transmission, storage and display of the material generated from the walks. I created a unique on-line context<sup>2</sup> and artwork that subverts static cartographic conventions through specialised software integrated with the required hardware. This custom software and hardware allows for the real-time collection of media contributions/content through the use of SMS and MMS capabilities of mobile phones. An Internet-enabled application was created through which an audience could view this content as it arrived, allowing for a real-time engagement with the walks from anywhere in the world.

The interface is an integral component, written specifically for this project that makes use of an experimental Zooming User Interface (ZUI) paradigm as this was deemed best for viewing mappings. ZUIs are interfaces that tap into man's inherent spatial organisation abilities, and hence, well suited to mapping applications.

This interface of the website facilitates the viewing of the subjective mappings, and allows for interactive manipulation of that content, making the subjective mappings mutable for creators of the mappings. A custom written Java

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<sup>2</sup> For simplicity's sake, I have called this a 'website', but this does not fully capture the complexity and ramifications of the system. For a full explanation of what the system entails please refer to the chapter Software.

application is downloaded to view the works. This application can be downloaded from the site <http://www.peripato.net>

The intent with the mappings is to subvert static cartographic conventions. Mappings that create a (re)presentation from the view point of ground level are responding to and reacting against the controlling view from above, which has been facilitated by the striation of the earth's surface using a grid of lines which is encapsulated in the contemporary world by the GPS system, referred to by some theorists as the 'Imperial grid' (Holmes 2004). The uncritical adoption of this system has been seen as a return to Cartesianism or the 'Cartesian tradition', a return to the controlling view from above. This posed the question: how can we free ourselves from the imperial grid?

As an artist working with software I was interested in the discussions and theoretical concerns emerging relating to software literacy and subjectivity. This led to the research question: how do we get around the domination of such powerful corporations that determine what and how we do with much computer software? How do we battle the power vested in software? I proposed that one strategy is to make use of open-source software in the development of the software and outline the reasoning behind this decision in the main body of the exegesis.

I investigated peripatetic art practices to inform the methodologies used by individuals and collectives to (re)present their spaces. This included research into media art practices (with a focus on the use of the mobile phone) in order to gain an understanding of related works and to inform this project's desired aims relating to the use of mobile phones; for example, does the ubiquity of mobile phones facilitate participation? Do the limitations of mobile communications devices hinder or enhance these processes?

A central premise of *Peripato Telematikos* has been that understanding is founded in personal experience. As a creative project it did not set out to solve a specific problem in the sense of a testable hypothesis, rather it is aimed at exploring the intersections of walking as art, cartography and software art. The intention was to make art through walking, both collectively and individually and to document and disseminate this knowledge through the creation of online mappings.

This project relies on walking to engage with the world. It has been revealed through experience that this walking has the ability to prompt reminiscent behaviour. The literature and experiences of others also supports this contention. As author, Rebecca Solnit, who has written extensively about walking, states:

Walking ... is the intentional act closest to the unwilled rhythms of the body, to breathing and the beating of the heart . . . Walking; ideally, is a state in which the mind, the body, and the world are aligned, as though they were three characters finally in conversation together, three notes suddenly making a chord (Solnit 2001, p. 5).

The three major aspects of this project: walking as art, cartography and software are related through their ability to produce a particular type of knowledge. A knowledge that can be highly subjective incorporating: 'atmospheres, emotions, reflections and beliefs ... as well as intellects, rationales and ideologies' (Anderson 2004, p. 260). Anderson continues to argue that walking is part of a wider post-modern project that endeavours to challenge knowledge that is generated from the outside, and seeks to find ways to create more equitable and collaborative forms of knowledge, as this project does when engaging a collective.

The walking creates or reveals knowledge and understandings of place, which is represented as mutable mappings through the facilities enabled by the software written specifically for the project.

## Peripatetic Art Practices

Wandering is the condition of contemporary art (Bordo 1996, p. 202).

I have a strong childhood memory of walking alongside my father. I watched his feet take great, confident strides while I struggled to keep up, alternating between a fast walk and a slow jog. I knew that one day, I too would be able to take great strides.

*Peripato Telematikos* looks at walking as an art form and in order to situate the project within an historical, conceptual frame, I will discuss related practices, artists, art movements and theories.

That going for a walk is considered art is not an issue →<sup>3</sup>... (after three decades of dematerialisation)... we are well used to the idea that art can simply be a walk →.  
Long (cited in Spencer 2004, p. iv).

Spencer has summarised the extensive history of walking as art in his thesis 'Hermes's Gift' (Spencer 2004, p. iv). Here I focus on a few of the important ideas raised by Spencer and provide some examples pertinent to my project. In investigating the history of walking and art we can look as far back as Baudelaire's flâneur (one who strolls) and his exploration of the urban environment of Paris in the 1850s. Baudelaire conceptualised the flâneur as the artist of the times, who needed to immerse himself [sic] in the metropolis and become in Baudelaire's phrase 'a botanist of the sidewalk' (Tiessen 2007). Baudelaire felt that traditional art was no longer adequate for the new dynamic complications of modern life brought about by the social and economic changes of industrialisation (Baudelaire 1964). So was born the relationship between the pedestrian activity of walking and art. Walter Benjamin, a German-Jewish literary critic, philosopher, social critic, translator, radio broadcaster and essayist

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<sup>5</sup> Walking about; itinerant; nomadic. From <http://en.wiktionary.org/wiki/peripatetic> accessed 25/03/2009

<sup>3</sup> Pointers are also found within the text before and after quotes, the quotes being contained in brackets- as if phenomena come across whilst passing through. (Spencer 2004).

subsequently adopted this concept, and his unfinished *Arcades Project* consists of an enormous collection of writings on city life in Paris and the culture of 'flânerie':

[It] was not the great men and celebrated events of traditional historiography but rather the 'refuse' and 'detritus' of history, the half-concealed, variegated traces of the daily life of 'the collective', that was to be the object of study, and with the aid of methods more akin – above all in their dependence on chance ... to the methods of the nineteenth-century rag picker, than to those of the modern historian (Eiland and McLaughlin 1999, p. ix).

Other 'artistic movements in the 20th century, from Dada and the Surrealists through to Fluxus and the Situationists have explored similar modes of distracted attention in traversing the city' (Lucas 2004). Most notably, the Situationists, with their work surrounding the use of urban space, 'from seemingly inconsequential rambles around European cities to relatively rigorous and well documented experimental activity' (Bonnet 1992, p. 77), developed an agenda extending beyond art alone and have had considerable influence on many contemporary works that examine urban space in some way.

There have been a number of recent conferences (e.g. *Walking as Knowing as Making: A Peripatetic Investigation of Place, Conflux*) focussing specifically on psychogeography, one of the key concepts of the Situationist manifesto, and a number of artists using the Situationist strategy of more-or-less unplanned walks (or, in Situationist terms, 'dérives').

*Walk Ways* (a traveling group exhibition held in various locations in the U.S. 2002-2004) brings together a selection of works by a diverse group of artists who explore the theme of walking as an action and/or as a metaphor (Frankel 2002).

Many artists have used walking strategies in different environments and forms: sculpture, minimalism, land art, and performance art to name a few. For example, Careri, author of *Walkscapes: Walking as an Aesthetic Practice* reports:

In December 1966 the magazine *Artforum* published the story of a journey by Tony Smith along a highway under construction on the outskirts of New York. Gilles Tiberghien ... considers this experience of the New Jersey Turnpike lived by Tony Smith – seen by many as the 'father' of American Minimal Art – to be the origin of Land Art, and the predecessor of an entire series of walks in deserts and the open peripheries that took place in the 1960s. ... [f]rom this moment on the

practice of walking begins to be transformed into a true autonomous art form (Careri et al 2002, p. 119).

Tony Smith, and many of his contemporaries for example Carl Andre and Richard Long adopted walking as part of their practice, challenging the existing attitudes to sculpture and Minimalism. Their work was a 'passage from the minimal object to the objectless experience' (Careri 2002, p. 122), and was seen as a pivotal moment in twentieth century art. Although the dissolution of the 'object' was a primary concern of many artists inspired by Tony Smith, for many it required further resolution. Richard Long, a British walking artist, produces ephemeral 'sculptures' often from objects found on the walks, whereas Hamish Fulton, another British walking artist, feels that 'the only thing we should leave are footprints' Fulton (cited in Careri et al., 2002, p. 145). Long's *A Line Made by Walking* (1967) was a seminal work and his practice is discussed throughout this chapter. Many recent walking performances embody this notion of the minimal object for example, the artist He Yun-Chang in his work *Touring Round Great Britain with a Rock*, '... casually selected a rock from a beach on the coast of Northumberland in northeast England, and carried it around the island of Great Britain in a counter clockwise direction, eventually returning it to the exact location from where it was taken' (Hood 2008).

In contemporary debates about the ethics of public art and 'social engagement' (i.e. what public art should be seen to do and not do 'for' its audience), walking-as-art has been proposed as a radical method of reconceptualizing the way in which images in and of public space are produced (Phillips 2005, p. 508).

However as performance artist Marina Abramovic comments:

If you talk with Hamish Fulton or Richard Long, the most important part of their work is their walk which nobody witnesses. What they deliver has nothing to do with that process. Particularly not if you take a photograph during the walk. The act of taking the photograph would be the most authentic moment (Abramovic et al., 1979, p. 15).

This raises the question, might it be possible to capture this 'authentic moment' using a medium that allows instant distribution from the actual location of the event? Can the 'most important' part of the walk be witnessed or self-documented?

*Peripato Telematikos* utilises mobile devices for the specific purpose of documenting the staged walks and thereby facilitating the creation of subjective mappings in real-time and capturing this 'authentic moment'. The mappings are mostly images, captured and transmitted by/as MMS. However the network operators restrict MMS message size to 100KB meaning that the final images must be compressed considerably in order to be sent. Working with this limitation requires an understanding of the repercussions of digital image compression. Any fine detail in a complex image can be lost. Images with less visual information are better able to retain their integrity, after being processed through the MMS constraints.<sup>4</sup>

Since the introduction of mobile phones, media artists in particular have been experimenting with this new medium in a myriad of ways. For example the UK group, Blast Theory, has made extensive use of mobile devices in works such as *Day of the Figurines* (2006) (Theory 2006b).

*Peripato Telematikos* uses mobile devices in order for participants to map their environs and to allow audiences to engage in real time with the walking performances.

Artists are responding to the technical possibilities of location-aware, networked media by asking what can be experienced now that could not be experienced before (Hemment 2004).

In the past, the public's access to walking-as-art events has been limited to the documentation or other by-products exhibited after the event. Mobile devices have the potential to broadcast content during the event allowing an audience to witness something of the event while it is taking place. This project realises that potential of live broadcasting of media through the creation of a custom system that is discussed in greater detail in the Software section.

A limitation of this system is that all communications devices are dependent on the network operators' provision of service. Within these restrictions mobile communication devices have the ability to capture media (images, text, video and

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<sup>4</sup> (To clarify what is meant by a complex image, a colour field image such as a Rothko painting has less visual information than a busy image, such as a painting by Goya.) This limitation influenced much of the photography that can be seen in many of the mappings. In the workshop environment, comparisons were made to works that focused on the minutiae of everyday life (e.g. American artist David Hammonds and British artist Richard Wentworth), in order to encourage participants to keep their images simple. This approach allowed participants to work creatively within the limitations mentioned above.

sound), and transmit that media almost instantaneously, enabling their real-time broadcast. Some projects explore these limitations, using the restrictions in creative, experimental ways. For example, Andrew Wilson, an English poet, has explored SMS, which has a restriction of 160 characters, for creating poetry; the results have been published in print and made available for viewing on a dedicated website (Wilson, 2007). More recently, the Darebin Council Arts Project Coordinator initiated a writing competition, Northern Notes Writers Festival 2008 - SHRT, shrts an SMS Writing Competition that required entries to be submitted by SMS (Forward 2008). These restrictions facilitate new and experimental approaches to existing media forms.

An Australian work that utilised mobile devices to document a walk and engage a remote audience is *Void: Kellerberrin Walking* (Minchinton 2003) conducted over a period of approximately six weeks in 2003, by Australian artist and academic Mark Minchinton. This performance walk addressed many issues, including Minchinton's identity and cultural heritage, and involved the use of a mobile device to communicate daily texts, images and GPS readings to the audience/readers through a web site.

Further examples of artists who have used walking as an art form are Domenico de Clario, an Australian artist (*breathing for Biagio walking*) and the artists that participated in the Walk – NETS Victoria Exhibition (Peter Corbett, Vicki Couzens, Nicky Hepburn, Brian Laurence, Jan Learmonth, Carmel Wallace, Ilka White, John Wolseley) (Copley 2008).

De Clario walked in the footsteps of an Italian migrant named Biagio, who, after arriving in Perth aboard the same ship that Domenico and his family arrived in, set out to walk the remaining distance to Melbourne. Biagio died later outside of Kalgoorlie (de Clario et al., 2007, p. 107).

For the Walk – NETS event, a group of artists were invited to undertake a 250km walk along a section of the western Victorian coastline, known as the Great South West Walk, and produce works in response to this experience:

For three weeks, this seemingly diverse group of artists walked through forest and river, estuary and bay to create work in response to their experience of an ever-shifting environment. Caught in the movement of the landscape, the artists followed a path that took them far from the familiarity and isolation of the studio (Copley 2008).

## Peripatetic Art and Mapping

A walk is just one more layer, a mark, laid upon the thousands of other layers of human and geographic history on the surface of the land. Maps help to show this (Long 1980, p. 564).

Artists engaged in walking produce many different and varied outcomes from their walks. One outcome that informs this project is the creation of mappings. According to (Dignazio 2009) this has its origins in the Situationists International (SI) movement previously discussed:

The key contribution from the SI, in relation to cartography, politics, and art, is that they set the stage for 'mapping' as an activity that was 'performed' through the individual human body in action in public spaces such as streets, parks, and plazas. Not only were artists taking on the role of mapmaker, but they were also taking on the roles of the surveyor, the photogrammetrist, and the data collectors, albeit in iconoclastic, idiosyncratic ways (Dignazio 2009, p. 196).

Following on from the SI, in the late 1960s and 1970s many artists, for whom other forms of expression had reached their limits, became interested in mapping as an art practice. These conceptual artists adopted a less political relationship than the Situationists and 'focused on the idea of an artwork, on theoretical methodologies of documentation, on site and on performance. These concerns directed their engagement with cartography further towards the processes of mapping' (Cosgrove 2011, p. 272).

Artists have continued to sustain a critical conversation with cartography to the present day. Many site-specific and performance art works 'map out' spaces in urban locations, and utilize the interactions between people and space (e.g. Lavery 2009). Contemporary art continues to engage with cartographical images and practice as can be evidenced by a series of major exhibitions in the 1990s and later<sup>5</sup>.

Many of the artists that walk create mappings as a by-product of their walks. This project uses walking as a means to create a (re)presentation of place which I

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<sup>5</sup> Please refer to CASEY, E. S 2005) *Earth-mapping: artists reshaping landscape*

have chosen to call subjective mappings. As an artist working with mappings, I have investigated related practices to situate this project. There is a great deal of activity at the intersection of art and mapping, as evidenced by the many texts that survey this field (Harmon & Clemans 2009, Dignazio 2009).

Artists are harking back to the premodern, subjective map that 'concentrated on geographical meanings' and offered 'as full an impression as possible of the lived texture of the local landscape' (Lippard 1997, p. 81).

Jameson concludes that 'the political form of postmodernism, if there is any, will have as its vocation the invention and projection of a global cognitive mapping, on a social as well as a spatial scale.'

[...]

There would be virtually no end to a list of every artist, literary critic, critical theorist, art historian, sociologist, or philosopher who globally or locally 'maps out' the contemporary cultural landscape (Bosteels 1996, p. 110).

Many performative, activist cartographic practices that have succeeded the SI have multiple influences, and have often been realised without knowledge of the movement. Nevertheless, these practices are related conceptually to the original aims of the SI about the individual or collective body encountering social and political space. These practices concern not only urban space, but also suburban, rural, and uninhabited spaces (Dignazio 2009, pp. 196-199). There are many aspects and trajectories to these works. For example, mapping the radically specific is one such prominent practice which involves mapping the small, hyperpersonal or the overlooked facets of the environment.

Richard Long's art practice (late-1960s to present), for example, consists of solitary, multiday walks in locations around the world. He considers the walks 'sculptures' and documents them via short texts, photographs, and gallery installations using natural materials that measure the individual's temporal presence up against a vast landscape (Dignazio 2009, pp. 196).

Utilising the global positioning system (GPS) receivers, Teri Rueb's *Choreography of Everyday Movement* (2001), maps the everyday activities of dancers. The dancers carry the devices with them in the course of their daily activities, resulting in a real-time drawing on the web. Subsequently, these drawings were printed on acetate and stacked between sheets of glass, overlaying each day on top of the next so that the audience could see how a particular person's daily itinerary through the city had changed. Mapping the radically specific is realised in many more recent projects including a year long research project that set out

to map a single city block in New York City (*One Block Radius* by Glowlab, 2004), a map of pumpkins on porches in the neighborhood of Boylan Heights, NC (*Boylan Heights pumpkin map* by Denis Wood, 1982), and a map of silent places in London (*Silent London*, Simon Elvins, 2005).

Another trajectory of contemporary mapping within art projects is the category of experimental geography. These projects usually take the form of tools that enable particular activities. For example, *iSee* (2001–present) is a web-based software application created by the Institute for Applied Autonomy, an organisation that provides technologies which extend the autonomy of human activists. *iSee* facilitates the path of least surveillance through New York City. Users would enter the start and end points of their journey through Manhattan and the application would generate a map that would allow the user to get to their destination via a route that would expose the traveller to the fewest number of surveillance cameras.

The availability of free mapping tools provided by companies such as Google have facilitated many artists, community groups, and activists to create collectively authored maps (Dignazio 2009, pp. 196-199). This intense activity in 'locative'<sup>6</sup> works and experimentation with mobile-networked media is evidenced by the fact that it has been the theme of major recent media arts conferences (ISEA 2004).

[T]he locative project is in a condition of emergence, an embryonic state in which everything is still up for grabs, a zone of consistency yet to emerge. As an emergent practice locative art - like locative media generally - is simultaneously opening up new ways of engaging in the world and mapping its own domain. This resonates with Deleuze's and Guattari's sense of territory, in which there is a blurring of the distinction between real estate and intellectual property, between the mapping of physical space and the production of an artistic or cultural milieu: the territory is constituted by the signature or expressive mark, both in the sense that birds use song to map their domain and that the artist creates a new way of seeing and occupying the world (Hemment 2004).

One interesting example of Situationist-like interventions making use of mobile networked media is the *Umbrella.Net* project (2004), which 'uses ad-hoc networking as a means to connect people who share the same physical space and

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<sup>6</sup> locative – location-aware, networked media - The term is commonly used to refer to many of these location aware works that have location-specificity embedded (usually facilitated by GPS).

who might engage in similar, yet individual activities' (Brucker-Cohen and Moriwaki 2005). The creative activity in this field is intense; a great variety of projects have emerged, many tackling issues of urban space and community. Many artists have:

...taken as their focus the idea of connecting people to people or people to information but the really unique feature of mobile wireless networks, the thing they can do that fixed networks cannot, is that they can enable more meaningful connections between people and places – they promise the end of 'the end of geography'. There is little doubt that the connection of people to the places that they live and work is integral to their sense of belonging and community (Bresnihan and Doyle 2004).

Similar to the early claims made for the Internet, mobile networks are also being seen as promising the end of geography. This comes as no surprise, as both systems make use of global communications networks that facilitate this dissolution of geography. But the two systems differ in one substantial way: mobile networks overcome some of the limitations of the fixed Internet network. In particular, they have the ability to extend the electronic networks into public spaces, so that engaging with the virtual community of the Internet does not require isolation from the immediate physical communities of the real world. Furthermore, these services can be provided whilst the user is on the move and not tethered to a computer terminal.

Related to this one of the defining claims of locative arts is the ability to raise peoples' awareness of and intimacy with their local environs, which is being seen as a problem of modern urban society and contributing to a loss of community and civil life. As a result many locative projects attempt to address this through staged interventions:

These new media not so much maintain our connection with a lost place through particulars but they bring the lost place into co-existence with the present. More importantly, they create experiences that defy traditional notions of past, present, or future, and instead embrace the possibility of being in more than one place at the same time or the possibility of different places being experienced in one location (Iverson 2008).

The mobile phone is being seen as a device with the potential to transform our perception of time and space:

'time-space compression' – that technology closes the gap of both space and time through its capacity to transcend the limitations of material communication and bodies (Boler 2007).

Through its ability to connect instantaneously to another place, our notions of geography are transformed, or as proponents of the Internet (somewhat breathlessly) hailed, we have reached 'the end of geography' (Rheingold; as a caveat, see the discussion of padded lamp posts below). We can be in one place physically, but at the same time engage with another distant location. Furthermore, time is distorted, as we are able to communicate instantaneously with others in any time zone. As mentioned previously, similar claims were made in relation to the Internet, and understandably so, as it is the communication systems underlying both technologies that facilitate these experiences. In many regards they are able to provide the same services.

One of the defining claims of locative arts is the ability to raise people's awareness of and intimacy with their local environs. This claim has also been made for many walking projects. As Hemment points out:

If a precursor to locative media were to be identified within the art world it might be Richard Long, who creates his art by walking through a landscape, annotating the physical environment he encounters with stones or other ambient materials, and documenting augmented space that results in photographs that provide an esoteric other to the objectifying gaze of cartography or satellite photography (Hemment 2004).

Many locative projects attempt to address this through staged interventions. But despite this potential, in some cases the technology can work against these aims. At the *Coding Cultures* conference (Sydney 2007) I talked with Giles Lane, one of the founders of *Proboscis* and *Urban Tapestries*. He described what he considered to be a major conceptual flaw of many projects using mobile phones for generating user content: that of asking participants to document the *ordinary* and everyday using *extraordinary* means. In their own practice it became clear that technologies could be an obstacle to engagement and participation. This was insightful advice and fortunately acquired early in the development of this project. Blast Theory has staged many works around the world combining media art, performance and game play. Their early projects required a large investment in technologies. Global Positioning System (GPS) receiver and PDA. Participation

was limited. In subsequent years they made use of very simple technologies, namely SMS.

Media art practices aside, in the everyday world we can witness another related phenomenon that works against engagement with place. How accustomed have we become to the sight of individuals totally lost in the use of their mobile devices? Oblivious to their surrounds, some are actually injuring themselves! In a rather farcical response to this, in London's Brick Lane padding has been placed around street poles to protect pedestrians immersed in their portable media from hurting themselves:

Britain's first 'Safe Text' street has been created complete with padded lamp posts to protect millions of mobile phone users from getting hurt in street accidents while walking and texting.

Around one in ten careless Brits has suffered a 'walk 'n text' street injury in the past year through collisions with lampposts, bins and other pedestrians.

The 6.6million accidents have caused injuries ranging from mild knocks and embarrassing cuts and bruises through to broken noses, cheekbones and even a fractured skull.

Almost two thirds - 62 per cent - of Brits concentrate so hard while texting that they lose their peripheral vision, researchers found (The Daily Mail 4 March 2008).

This distancing distraction has not gone unnoticed by cultural commentators:

There has been criticism of new media technologies implementing a distancing from our own locations, preventing participation in our local community, isolating us from our surroundings, leading us to ignore our own environment when one is able to access new environments in new spaces. Virilio warns against the loss of geography, arguing that as 'Space is being continuously devalued' in an age defined by speed the departure and the destination are now one in the same. 'With the instantaneous communications media, arrival supplants departure: without necessarily leaving, everything "arrives". The sedentary voyeur is in a constant state of mediated reception leading to the 'Growing imbalance between direct and indirect information' (Ota 2008, pp. 361-362).

Therefore on the one hand there is considerable optimism for the mobile phone's potential to (re)connect us to our local environs, whilst in other instances we can observe the opposite occurring.

This issue of 'distraction' is directly related to usability. The '[g]rowing imbalance between direct and indirect information' is strongly related to usability which is a concern with many forms of new technology:

international standard, ISO 9241-11, provides guidance on usability and defines it as: The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use (UsabilityNet 2006).

The more complex a device is to use, the more it distracts our attention from our immediate surroundings, negating the promise of a greater awareness of and intimacy with our local environs.

The ubiquity of mobile communication devices further motivated their use in this project. Mobile communications devices have seen an unprecedented uptake, extending their reach into many sections of society. It has become by far the most ubiquitous form of electronic communication in the world, reaching many whom in the past may have been excluded from access to such technologies. This penetration has prompted innovative commercial and artistic applications of this medium. This availability and ubiquity increases the potential for public participation in events that solicit involvement through such devices. For instance, Blast Theory:

draws upon the near ubiquity of handheld electronic devices in many developed countries. Blast Theory are fascinated by the penetration of the mobile phone into the hands of poorer users, rural users, teenagers and other demographics usually excluded from new technologies.

Some research has suggested that there is a higher usage of mobile phones among the homeless than among the general population (Theory 2006a).

Blast Theory has staged many works drawing on this ubiquity. One example, their work *Day Of The Figurines* relies on SMS for participation, and engaged 'up to 1,000 players roam[ing] the streets, defining themselves through their interactions' (Theory 2006b).

In parts of the world where technological infrastructures are lacking the mobile phone has enabled innovative pedagogical applications. The Finnish group, *MobileEd*, is working with South African schools on pedagogical applications for

mobile technologies in the classroom (MobilED 2009). The schools being supported in this initiative do not have access to the technology that western schools take for granted: internet connections and computers, nevertheless, cheap mobile phones with an appropriate infrastructure can be leveraged to provide many innovative services to students. In another instance, an art/activist application [Transborder Immigrant Tool]<sup>7</sup> makes use of 'a Motorola i455 phone because it is cheap (around \$40), requires no service for GPS functionality and accepts new algorithms' (Le-Phat Ho 2008) to assist Mexicans negotiating the US-Mexican border by providing them with information necessary for survival e.g., water resources.

My project relied on the user being able to efficiently operate the mobile phone to take an image utilising the inbuilt camera and send this image via MMS to a given number (i.e. the mobile number of the gateway modem). In the workshops I provided the mobile phones. The usability of these phones was critical, as the participants had no prior experience with these particular devices.

Serendipitously, the phones that I had procured for the workshops required a very simple process to take an image and send it via MMS.<sup>8</sup>

Where participants used their own phones I assumed that they understood their operation, although it turned out this was not always the case, as many people had never used the MMS capabilities of their phones. If the operation of the phones was inefficient, awkward or time consuming then the engagement with place that the walks encouraged would be interrupted. There would also be greater potential for failed submissions and frustration that would all detract from the experience.

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<sup>7</sup> The project, funded by Arts and Humanities (Transborder Grant 2007-08) at UCSD and winner of the Transnational Communities Award in 2007, aims to reduce the number of deaths at the US/Mexico border by providing a device that migrants can use to locate resources, such as water caches and safety beacons, as well as situate themselves in the desert. LE-PHAT HO, S 2008) *Locative Media as War*, *post.thing.net*, no. 21/05/09.

<sup>8</sup> Pressing the central button on the phone's keypad 3 times allowed the user to frame their picture. Pressing this same button a further 5 times, took the picture and sent it to the gateway modem via MMS.

Andrea Phillips, writer and art historian has noted, that walking 'has enchanted us ... because it offers a way of "writing" the landscape that does not seem to be colonial; that does not striate<sup>9</sup> (c.f. Deleuze and Guattari)' (Phillips 2005).

In a special issue of *Cultural Geographies*, editor David Pinder argues that 'experimental arts and modes of exploration can play a vital role in the development of critical approaches to the geographies of cities, where they may challenge norms about how urban space is framed and represented, and where they may help to open up other possibilities' (Pinder 2005). Although written specifically in relation to urban space and geography, it is these notions of challenging norms and opening up other possibilities that interests me. I extend these ideas in the hope that they may open possibilities for not only geography but for art and other realms that I cannot anticipate.

As Andrea Phillips has noted, all 'artworks that are either produced or experienced by walking, sometimes both [...] intentionally or not, draw in ancient and modern mythologies of walking – from pilgrimages and diasporas to flâneurisms and dérives – as part of their effect' (Phillips, 2005).

Walking was the basic physical act required of all participants engaging with this project. It is through walking that participants investigate and document the chosen locale, in the process creating a subjective mapping.

Indigenous song cycles and dreamings are like invisible interlocking pathways, performed as a walking through landscape. These creation stories link the walker to an enduring sense of land as ancestral body. Heidegger considers the 'unfolding path' as a kind of conversation – a measured rhythm that gives the walker a sense of their own place and trajectory. Walking, we become attuned to a particular way of being, variously described as a kind of immersion or loosening (Copley 2008).

Considerable research and planning were required for the walks conducted for the project. Their execution was staged and broadcast in real-time, constituting

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<sup>9</sup> Deleuze and Guattari's term 'striated' compares sedentary, delimited, regulated space (eg, a field) with 'smooth' space that is nomadic and heterogeneous (the sea, the desert). See Deleuze and Guattari 1987, Chapter 14, "1440: The smooth and the striated": "In striated space, lines or trajectories tend to be subordinated to points: one goes from one point to another. In the smooth, it is the opposite: the points are subordinated to the trajectory" (Deleuze and Guattari 1987, p. 478).

micro-performances. An important consideration was to disrupt habitual behaviour so that the walks would not cover participants' familiar routes, hopefully exposing participants to new insights about their locales.

Participants were given maps of the locale and asked to draw a route of approximately three kilometres. These maps were then handed out randomly so that no participant knew their intended route. The strategy was successful in the sense that the majority of participants returned from their walks invigorated, and despite being in familiar territory, many reported gaining new knowledge as a result of the walk. Some took the instructions so literally that in attempting to follow the routes, they ended up on the third floor of an office building. The collective strategy differed somewhat to that adopted for my personal walks. As with the collective walks, I sought to disrupt habitual behaviour. I chose to follow routes that did not appear on any current static map, to disrupt the dominant structure, by avoiding its restriction to predefined routes and paths. Hocquard, a French poet, succinctly describes the type of mapping that this project creates through the walking:

A map is never already there, finished, in front of me, at my disposal. I could almost say that I am inside my map, in the sense that I construct it (just as I draw up my shopping list), little by little, by following my needs and my cravings. A map is projective (whoever creates it allows it to evolve depending on his project; especially when the project progresses simultaneously with the map, or when the map and the project are one.) It's in this sense that Deleuze talks of the map as a performance (Hocquard 2006).

An initial influence was de Certeau's walker (de Certeau 1984):

In 'Walking in the City,' he [Certeau] focuses specifically on spatial practices within a panoptically and cartographically defined urban system, and locates transversal power in the everyday act of walking (Reynolds & Fitzpatrick 1999, p. 74).

But upon closer examination, it seemed that this walker was somewhat powerless, as her meanderings are restricted to following the routes devised by a greater power, despite the walker's engagement at ground level. Stott argues in relation to de Certeau's walker, 'the space of the "walker" does not escape the exercise of power within it: in its actions, the "walker" is a subject of (state) power and ideology' (Stott 2004, p. 14). He continues with a comparison between

de Certeau's walker and the controlling seventeenth century Baroque theatre of Spain. He points out that in both cases the public is rendered powerless:

In seventeenth century Spain, the Baroque was a time when a multiplicity of individual viewpoints were being asserted, giving rise to social instability. This constituted a threat to the hegemonic aspirations of the then absolutist monarchy, but rather than respond with violent repression of disruptive social forces, the monarchist state established a 'culture of guidance'. This was a reactionary culture that sought to 'correct' the erosion of extant social hierarchies by mediating and directing the agency of the masses.

'Guidance' was most effective where the state's propaganda had the largest audience. In seventeenth century Spain, this was the theatre (Stott 2004, p. 14).

Stott contextualises his argument by way of a critique of the work of the French artist Pierre Joseph who created "memory maps" of Japan and the Paris metro [that] trace an accumulation of trajectories through time, which are remembered in the practice of map-making':

[F]ollowing those 'paths' already inscribed upon the urban landscape by those who maintain, through the authority of their accumulated capital, the (self-proclaimed) capacity to structure it. Furthermore, it might be more a case of re-territorialising rather than de-territorialising ... i.e. a case of re-mapping the boundaries of power according to a more fluid rationale rather than subverting the authority of those boundaries and the spaces of power they delineate (Stott 2004, p. 15).

De Certeau's walker is restricted (as is artist Pierre Joseph, and others) to following 'tracings', predefined routes, traversing paths of extant knowledge. Phillips adds:

Of concern in his construction is [...] the fact that his 'subjects' are just that: denied their part in any proper citizenly recuperation of the visual, of the ability to take command of image production. [...] On the one hand, in an important debate about subjectivity and citizenship within social life, pedestrian movement can be seen to open up individual experience to new and different ways of perceiving and designing the world / offering modes that, in Certeaudian terms, can shift and sway according to their context. On the other, a more critical understanding of pedestrian movement can be seen to inhibit the impulse to think in such fluid terms; to accept the criticality of the tentative, the hesitant, the speculative and

contingent aspects of pedestrianism, and to see in it a form of protest against the streamlining and de-differentiating, or smoothing out, of urbanization that Certeau's ideas, in their championing of weakness and invisibility, emphasize (Phillips 2005, p. 512).

Of greater interest to me was Deleuze and Guattari's distinction between tracing and mapping. A tracing implies that we are following predefined routes, traversing paths of extant knowledge, whereas a mapping is created through experience, experimentation and performance, creating paths and connections where they previously did not exist.

[L]ocative media resist easy definition and may be best represented by one of Deleuze and Guattari's maps:

'The map is open, connectable in all its dimensions, and capable of being dismantled; it is reversible, and susceptible to constant modification. It can be torn, reversed, adapted to montages of every kind, taken in hand by an individual, a group or a social formation. It can be drawn on a wall, conceived of as a work of art, constructed as a political action or as a meditation...

Contrary to a tracing, which always returns to the "same", a map has multiple entrances' Deleuze and Guattari (cited in Galloway and Ward 2005, p. 3).

Theoretically, de Certeau's walker was an initial influence, but upon closer examination, it became apparent that this walker was somewhat powerless, as her meanderings are restricted to following the routes or 'tracings' devised by a greater power, traversing paths of extant knowledge despite the walker's engagement at ground level. Deleuze's notion of tracings and mappings was of greater interest to me. A tracing is that which de Certeau's walker is confined to, whereas a mapping is created through experience, experimentation and performance, creating paths and connections and therefore knowledge, where they previously did not exist.

In summary, contemporary art continues to engage with cartographical images and practice as can be evidenced by a series of major exhibitions in the 1990s and later, and the many recent texts that survey this field (Harmon & Clemans 2009, Dignazio 2009). Artists engaged in walking produce many different and varied outcomes from their walks, amongst them the creation of subjective mappings that informs this project. Extending the idea of mapping, the availability, ubiquity and ease of access to mobile devices has prompted intense

activity in 'locative'<sup>10</sup> works and experimentation with mobile-networked media. This facility has been harnessed in this project to provide a simple means by which walkers can document their walks and in conjunction with the online environment, provide a means by which an audience may engage with the walkers. One of the defining claims of locative arts is the ability to raise peoples' awareness of and intimacy with their local environs, and despite this potential, in some cases the technology can work against these aims. This consideration influenced the technology and methodology used with *Peripato Telematikos*.

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<sup>10</sup> locative – location-aware, networked media - The term is commonly used to refer to many of these location aware works that have location-specificity embedded (usually facilitated by GPS).

## Cartography

New technologies have the ability to create highly accurate representations of our physical surroundings but they also present us with the opportunity to express location outside of standardised forms and reinstall subjective articulations of space Harvey (cited in Ota 2008, p. XX).

This project creates subjective mappings through the documentation of collective and individual staged walks. The mappings are generated in real-time and consist of media that the walker submits through their mobile recording device. Research into current cartographic thinking on mapping revealed a dilemma in this discipline. The open access to satellite imagery merged with electronic databases is superseding conventional maps. Abrams and Hall (2006) highlight the problematics of cartography in their discussion of mapping technology:

In his recent chronicle, *The Mapmakers*, John Noble Wilford notes that digital technology has brought about a revolution in the way maps are created and used that is without precedent since the Renaissance. [... M]apping technology has split the interface from the database, a split comparable to the liberating effect photography had on the development of painting. Before the advent of aerial photography, satellite tracking and computerized data-gathering, a map was expected to represent its territory with comprehensive accuracy. Freed of that responsibility, cartographers can manipulate their data into any number of visual representations - an act so potent it has attracted the attention of other disciplines. As Harley remarked, 'Maps are too important to be left to cartographers alone' (Abrams and Hall 2006, p. 12).

Mapping has attracted the attention of the art world, which has been a fertile ground for experimentation with maps, and this has come to the attention of the cartographic discipline. There is so much activity in this area that Woods has remarked: '[T]here is a cresting wave, and it awaits skilled surfers' (Cosgrove 2006, p. 4).

This is a quote from a 2006 special issues of *Cartographic Perspectives* (the journal of the North American Cartographic Information Society) on art and maps. The special issue gives a good summary of the current intersections of art and maps and notes its prevalence, but itself also signifies the importance of the work being conducted in these intersecting fields.

The art world's response addresses some of the contemporary concerns surrounding maps and their use. The cartographic community itself, as mentioned previously, is leading a call for experimentation in the visual forms of maps, given that it is now freed of the responsibility to represent space with accuracy. Furthermore, the cartographic community is acknowledging the inherent subjectivity of maps and, given that accurate representation of space is now accomplished by satellite imagery, is looking to reestablish subjective articulations of space. Historically maps purported to be objective, but their subjectivity is now well understood, and they have served to support imperialist expansion and other forms of control.

As an instance of the 'microphysics of power', the imposition of rational order upon space is 'the minuscule and ubiquitously reproduced move of 'gridding' (quadriller) a visible space in such a way as to make its occupants available for observation and 'information' de Certeau (cited in Stott 2004, p. 13).

In response to this controlling view of the world from above, mappings are being constructed from the perspective of the person on the street. This raises the possibility of mappings that are created by many, from a multiplicity of viewpoints, and not by a single, overarching authority. This controlling view from above has been facilitated by the striation of the earth's surface using a grid of lines of longitude and latitude, an inseparable component of maps. This grid is encapsulated in the contemporary world by the GPS system, referred to by some commentators as the 'Imperial grid' (Holmes 2004). In *Parables for the Virtual* (2002), Massumi argues that if one reduces the systems of meaning to positions on a grid, one denies the very variation and transition inherent to those systems of meaning. The GPS system is one of many technologies that have radically changed contemporary western society, allowing anyone to pin point their position, or the position of others, on the earth's surface with considerable accuracy. But modern technologies raise other issues for mapmakers. We live in a world characterised by 'speed, fluidity and ephemerality of contemporary means of transport, communication and media technologies' (Stott 2004, p. 15). How are these factors to be accounted for in maps of the contemporary world? How can a map incorporate time? How can we free ourselves from the imperial grid?

The mappings for *Peripato Telematikos* subvert conventional cartographic practices by dispensing with the base map and any reliance on GPS information; together, the base map and GPS might be called *static maps* since they express a 'snapshot' view. Furthermore, the mappings are created from the experience(s)

of those engaging with the places being mapped; hence they are subjective and constructed from a multiplicity of viewpoints over time, are open-ended, mutable and can be reconfigured by those that create the mappings. This has all been made possible through the software system that is the backbone of this work. Initially the mappings appear as an infinite void waiting to be populated by content generated by participants undertaking guided walks. The empty spaces signify uncharted territory in a similar fashion to the maps of medieval times. Likewise, this work's mappings are blank/empty unless the place that they purport to represent has been engaged with (walked), and are populated, in close to real time, with content sent by the walkers. As the constituent components of the mappings are received by the system, the mappings are dynamically generated with minimal to no intervention. If the source of the content is considered trusted then there is no intervention required and the mappings are generated automatically, and in real-time, whereas if the source is not trusted, there is a need to vet the content first (Please note that this was a university ethics requirement)<sup>11</sup>. If these events (i.e. the transmission of content and the vetting) are synchronised, which the system is capable of supporting, the mappings generated will be created in close to real time.

Many works in this field lumped under the banner of 'locative arts' use existing 'static' maps, annotated with subjective material, often including GPS information so that there is a direct association between the content and its location in what has been described as the Imperial grid (Holmes 2004). As noted by some commentators (Broekman, Hemment, Fusco, Lovink), making use of this infrastructure without any critique is akin to complicity with the 'society of control'.

Furthermore, participants engaging with the places being mapped generate the constituent components of the mappings. As a result, as I have written, the mappings are deliberately subjective, in direct contrast to the purported objectivity of conventional maps:

[L]ocative media strives, at least rhetorically, to reach a mass audience by attempting to engage consumer technologies, and redirect their power. Today this is more important than ever (Tuters and Varnelis 2006).

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<sup>11</sup> This university ethics requirement works against the real-time aspect of the work. Fortunately, in most instances the sources are known and trusted therefore the mappings are created in real-time.

Other important aspects are the *mutability* and *multiplicity* of the mappings.

*Mutability* was an important conceptual consideration as it addresses a contemporary shortcoming of maps: their static nature. We live in a dynamic and rapidly changing world, and any map that attempts to represent this dynamic world, can become quickly outdated.<sup>12</sup> How would it be possible to incorporate time in a map? I have referred to the representations as mappings and not maps. Maps imply a fixed and terminal state, whereas a mapping can be an ongoing process, one that incorporates time through the ability of the mappings to incorporate content over time. The software system supports the creation of open-ended mappings. Constituent components can be added over time, and if so desired, indefinitely.

*Multiplicity* relates to the collective mappings and the fact that they are generated from many viewpoints resulting in a mapping that is not from the perspective of a single authority. This is in contrast to the single god's eye view of a static map created by a purported 'objective' authority. If, as noted by many commentators, we are indeed multiple, then even a mapping produced by a single person can be deemed as such.

If, as Deleuze and Guatari argued, we are each actually multiple, than [sic] collaboration exists more as an extension or deepening of that multiplicity, rather than an entirely new mode of working (Craig 2006b).

The 'locative project' would not be possible without the provision of GPS<sup>13</sup> services and this has been a major factor for many media arts practitioners. Location aware media is enabled through GPS. After some initial experiments, I decided not to utilise GPS information in the mappings. There are a number of reasons behind this decision: *relevance*, *mutability of the mappings*, and *access*.

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<sup>12</sup> For example, I referred to Google maps (map is dated 2009) for directions to navigate from Melbourne to Bendigo on 9/5/09. The map was too old to refer to the now existing freeway and so the instructions provided would have been impossible to follow. Is this happening with in-car GPS navigation based systems?

<sup>13</sup> The Global Positioning System (GPS) is a U.S. space-based global navigation satellite system. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth.

GPS information — expressed as coordinates of latitude and longitude, or the now more common UTM coordinates — holds little relevance for the majority of people. It may facilitate navigational systems in automobiles and other transport systems, but even in that case, precise coordinates are of no practical use. Orientation is done visually and spatially in relationship to known landmarks. This made me think about the relevance of longitude and latitude information appended to the constituent components of this project's mappings. The mapping elements do not index 'important' landmarks, so their absolute location in the imperial grid is irrelevant.

In my own project, as I was not interested in simply appending subjective information to a base map, but to sever the mappings from the base map, GPS information served no real purpose other than to fix aspects of the mappings — precisely what I wanted to avoid. If the mappings were to be truly mutable then any fixing of content was to be avoided.

Additionally, if I had decided to embed GPS information in the mappings I would have severely reduced participants' access to the project as at the time there were few phones on the market with GPS capabilities. Requiring participants to have GPS enabled phones would have excluded the majority of participants. My concerns aside, the use of a military infrastructure (i.e. the GPS system) in media art works have attracted some criticism from commentators in the field as detailed below. The GPS system allows us to locate ourselves absolutely anywhere on the earth's surface through the grid of lines of latitude and longitude. This grid has been instrumental for imperialist expansion, as it has facilitated the clear delineation of geography imperative to the colonial powers program of expansion. Brian Holmes, an art critic, theorist, activist and translator, proposes that by allowing ourselves to be targeted by a global military infrastructure (the United States Army controls GPS satellites) we are being 'interpellated into Imperial ideology' (Holmes 2004). He argues, 'the questions of social subversion and psychic deconditioning are wide open, unanswered, seemingly lost to our minds, in an era when civil society has been integrated to the military architecture of digital media.' For Holmes, engagement with these technologies requires a reflexive approach so as not to inadvertently valorise this new imperialism:

The reluctance of many locative media practitioners to position their work as political has led some theorists such as Andreas Broekman (director of the Transmediale Festival in Berlin) to accuse locative media of being the 'avant-garde

of the "society of control", referring to Gilles Deleuze's description of the contemporary regime of power (Tuters and Varnelis 2006).

The uncritical adoption of this system has been seen as a return to Cartesianism or the 'Cartesian tradition, with its illusion of homogenous three-dimensional space seen with a God's-eye-view from afar' (Jay 1988, pp. 16-17). This philosophical framework has been heavily criticised for many reasons, including 'its privileging of an ahistorical, disinterested, disembodied subject entirely outside of the world it claims to know only from afar' (Jay 1988, p. 10). Coco Fusco, a prolific multimedia artist, writer, and professor, adds:

It is as if more than four decades of postmodern critique of the Cartesian subject had suddenly evaporated. [...] In the name of a politics of global connectedness, artists and activists too often substitute an abstract 'connectedness' for any real engagement with people in other places or even in their own locale (Fusco 2004).

Despite Fusco's diatribe being more a criticism of mapping practices than the use of GPS alone, a return to Cartesianism through engagement with location specific technologies is being seen as a step backwards, or at least 'enslaving us to a new Cartesianism' (Tuters and Varnelis 2006). These criticisms seem at odds with the optimism surrounding many mapping/locative works, and in the case of Fusco's critique, may be ill informed. For example, Fusco bemoans the lack of engagement with people in their own locale, which ignores projects like:

canal\*INVISIBLE is a mobile audiovisual communication project, intended for groups without active presence in the main mass media. Mobile phones are given to groups that are deemed marginalised in order for them to create 'mappings' of their lives (megafone.net 2009).

Engagement with people in their own locale is a common thread in many mapping/locative works.

Although many of these criticisms may be well founded, their 'antagonist tenor often seems to be an inversion of the boosterist claims made in favor of locative media. There's something peculiar, even comical, in how the movement is, on the one hand "the Next Big Thing" to some, a capitalist apocalypse to others' (Tuters and Varnelis 2006).

Perhaps we could invoke Guy Debord's theory of effective radical contestation, (*détournement*), as a way of unraveling this. This theory argues that merely contesting any force through its negation fails to escape from the original force's terms. A binary opposition 'reacts against the construction of an ambiance based on a given metaphysics by constructing an ambiance in the same framework that merely reverses — and thus simultaneously conserves — the values of that metaphysics' (Craig 2006).

From the above discussion it is apparent that opinions are polarised in relation to mapping practices in media arts. The proponents of this type of work argue 'that locative media offers a conceptual framework by which to examine the certain technological assemblages and their potential social impacts [... and] strives, at least rhetorically, to reach a mass audience by attempting to engage consumer technologies, and redirect their power. Today, this is more important than ever. [...] Recognizing this, philosopher Alain Badiou referred to the maps of power drawn by artist Mark Lombardi as 'the creation of a new possibility of art and a new vision of the world. [...] Deleuze, too, agrees, writing expressly of the society of control: "There is no need to fear or hope, but only to look for new weapons"' (Tuters and Varnelis 2006).

### Concerns of Cartographic Discipline

As mentioned previously, the cartographic disciplines role in providing accurate maps has been superseded by satellite imagery combined with online databases. Their response has been to encourage a subjective, socially inclusive cartography, to bring to the fore that which has thus far been omitted from maps, to encourage experimentation with map forms given their emancipation from having to provide accurate representations, and to explore possibilities for mapping to represent a fluid, ephemeral, dynamic world; what static representations are unable to do. As noted by Lippard, this response is not entirely new, and perhaps those that led this call in the sixties, did so in anticipation of the current problems with cartography.

The mapmaking process can also bring together disparate elements in a community. In the sixties, geographer William Bunge proposed a 'Society for Human Exploration' that would map from different human viewpoints, including children's. [...] Local people would lead expeditions to create 'oughtness maps,' whose goals were to change rather than merely map the world. (Lippard 1997, p. 79)

This opens the way for maps to articulate a subjectivity missing from maps from the:

[T]ime of the Renaissance as new objectivity and functionality began to enter map making techniques leading to the standard of map we have today — ‘maps stripped of all elements of fantasy and religious belief, as well as any sign of the experiences involved in their production had become abstract and strictly functional systems for the factual ordering of phenomena in space’ (Ota 2008, pp. 361-362).

In contrast to the maps we have today, this project's mappings are totally constructed of the experiences involved in their production (i.e. staged walks), and make no attempt to factually order space. I proposed a subverting of the map, by creating a (re)presentation from the view point of ground level; a montage of media fragments. A mapping rather than a map, one that is dynamic, mutable and embodied. This builds on de Certeau's proposal that place is defined by urban planning but transformed into a space through the act of walking:

space is composed of intersections of mobile elements. It is in a sense actuated by the ensemble of movements deployed within it. [...] In short, space is a practised place (de Certeau 1984, p. 117).

The mappings for *Peripato Telematikos* are constructed totally by media that the walker submits through their mobile recording device. Not the ‘voyeur’ who is ‘at a distance’ and thus ‘a solar Eye, looking down like a god’ who ‘must disentangle himself from the murky intertwining of daily behaviours and make himself alien to them’ (de Certeau 1984, pp. 92-93). The walker makes no pretence to mapping a totality, objectivity, or ordering space. Her intervention is one that is very localised and amongst the ‘murky intertwining of daily behaviours.’ This raises the possibility for mappings to articulate knowledge that isn’t solely about ordering space, but a multiplicity of concerns. For example:

MILK [a project by Ieva Auzina and Esther Polak traced the path of milk from its origins in the udder of a cow in rural Latvia to a cheese vendor in the Netherlands] suggests a powerful vision of how locative technologies could allow one to more fully understand how products are commodified and distributed through the actions

of global trade, thereby making visible the networked society. ... [W]hen tied to a materialist vision, the recent turn to maps is among the strongest critiques of globalization available to us. (Tuters and Varnelis 2006).

Here we have two very divergent manifestations of mapping. *MILK* provides a glimpse of the networked society through tracing the path of a basic food product, whilst the maps drawn by Lombardi, an American artist, visualise the networks of power, corporations and the military.

Perhaps the biggest of all challenges is to map '[t]he complexities of the contemporary world – those of financial markets, information networks, social relations, etc. – [that] are said to be 'unfigurable', opaque and unrepresentable.' The map must now take into account the dynamic nature of the world. How can a map be dynamic? Any representation that is static is fixed in time, and represents a snapshot of its subject at a particular point in time. In order to incorporate time, the medium itself must have this faculty. Networked media such as the Internet is the most suitable candidate.

The mappings produced for this project are accessed on the Internet. The constituent components are stored in an online database, and are extracted from the database and presented in ZUI (Zooming User Interface), whenever a mapping is viewed. As is the case with satellite maps, the interface is split from the database. The interface serves all mappings, each differentiated by the components that together comprise that mapping. These components are added to the database over time, and can continue to be so indefinitely. Unlike static representations these mappings can change over time, opening up the possibility of representing the 'unrepresentable' complexities of the contemporary world.

As mentioned previously, this project's mappings are implemented in such a way as to allow unrestricted manipulation of the constituent components so that the mappings are mutable. All uploaded elements are available for further manipulation. Their position (x, y and z-planes) in the interface is variable. Authors are able to move these elements and create associations between elements and group others. As a result, the mappings are not fixed in time or spatially. All the constituent components can be added over time and subsequently moved in relation to one another, further complicating the idea of a 'map', but coming closer to the Deleuzian notion of a map:

Make a map, not a tracing ... What distinguishes the map from the tracing is that it is entirely oriented toward an experimentation in contact with the real. The map

does not reproduce ... it constructs ... The map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification. It can be torn, reversed, adapted to any kind of mounting, reworked by an individual, group, or social formation. It can be drawn on a wall, conceived of as a work of art, constructed as a political action or as a meditation (Deleuze and Guattari [1980] 1987, p. 12).

The tracing that Deleuze refers to is what we have come to know as the base map. It represents extant knowledge and therefore proposes nothing new, simply a reiteration of existing ideas. The base map has also been dispensed with in this project's mappings. If we are to accept that current mappings represent a Cartesian and static notion of space (Sant 2006, p. 99) then to simply take an existing map and overlay it with subjective content only reinforces this. We are still dealing with the same base map, with all its inherent problems, the only difference being that it is now annotated with subjective information:

Current collaborative mapping projects using locative media technologies have often overlooked the conventions of the base map as a site for reinvention. Although these projects are ambitious in their aim to propose alternative organizations of urban space through the way it is digitally mapped, they remain bounded by datasets that reinforce a Cartesian and static notion of urban space.

[...]

Although many collaborative mapping projects undermine their own base maps by layering them with collectively defined concepts of space; including participants' emotions, itineraries and memories, these annotations are inextricably linked to the predefined foundations of the map they overlay (Sant 2006, pp. 99-100).

In some instances, the mappings serve to embed media into place. Subsequent visitors to these sites, with the correct equipment, are then able to retrieve the media left by the mappers:

Geograffiti (CN/UK) and GeoNotes (SE) ... seek not to document or interpret the environment but to embellish it with digital graffiti or virtual tagging as expressive mark (Hement 2004).

This has obvious applications for audio-guided tours, which is already widespread. Outside of the media art world, artists work with maps in ways that are less reliant on the base map, many dispensing with it altogether.

Aside from reinforcing a Cartesian and static notion of space, the base map, with its reliance on the grid, can be seen to be reinforcing a static notion of thought:

When we think of space as 'extensive,' as being measurable, divisible, and composed of points plotting possible positions that objects may occupy, we are stopping the world in thought. We are thinking away its dynamic unity, the continuity of its movements. We are looking at only one dimension of reality (Massumi 2002, p. 6).

For Massumi, this reliance on the grid represents a far greater problem as it stifles the potential for change and looks at the world in a way that restricts possibilities.

The walking and cartographic research has informed the development of the tools required to facilitate this project: namely the use of mobile phones, the custom-made system for receiving content sent from mobile phones and the interface. The tools enabled the documentation of the walks that are discussed in the next chapters.

The tools themselves, their research and development are discussed in detail in the section: Software.

## The Walks

While this project initially set out to provide a platform for collective expression through walking a personal strand grew out of testing the software before releasing it for public use. Through simple trials and experiments my own walking performances started to emerge and I began to realise what the process of walking might be capable of manifesting. This idea was confirmed during the workshops and collective walks in which I observed that the majority of participants seemed to be invigorated and imaginatively awakened by the walking. In all contexts, this seemed to be a constant. What was it about the walking that had this effect? Was it the way the walking was conducted? Mock, a British academic and performer, gives an insight into what the connections might be:

Like enchantment, walking is a synthetic act that combines a series of opposites in a dynamic dialogue: inner/outer, past/present, the poetic/real. Moreover, the point of that dialogue, as in Bachelardian reverie, is to open the subject to him/herself and to the world at large (Lavery 2009, p. 51).

To explore this idea further I set about conducting further solo walks and documenting them through a process of mapping. The walks undertaken in my local suburban environment brought back childhood memories of wandering and the state of reverie that had produced. Mock goes on to say:

More to the point, the experience of being in that environment, its assault on my senses, appeared to be the very cause of my enchantment. By encouraging me to dream, the landscape acted as a mnemonic transporting me back to what Bachelard calls "the solitude of childhood" (Lavery 2009, p. 51).

This relationship between autobiography, walking and the maps it produced became an important aspect of the project provoking me to consider 'autobiography as cartography of self' (Heddon 2008, p. 88). While Heddon's (a British academic and performer) quote identifies a relationship between autobiography and cartography, Smythe, an American academic and writer, (Smythe 2007) has explored this relationship further through a technique he devised drawing on Ulmer's (an American academic) *electracy*<sup>14</sup> (Ulmer 2003) that he calls *autocartography*: the writing of one's self-story as a map. If we accept that the walking I have discussed thus far can produce a mapping or a cartography, then walking could also be viewed as a means to construct

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<sup>14</sup> Electracy is to digital media what literacy is to alphabetic writing: an apparatus, or social machine, partly technological, partly institutional. (Ulmer 2003)

autobiography. This view is supported by the writings of many artists using walking as a means to spatialise their practice (Mock 2009, Heddon 2008, Pearson & Shanks 2001, Smith 2009).

As Mock observes 'the acts of walking, remembering and writing, and thus the construction of narrative self and performance spaces, were intimately related' (Mock 2009, p. 7). One of the artists Mock is referring to is Carl Lavery, a performer, lecturer and writer. In discussing his work, *Mourning Walk* he writes:

'I was acutely aware of a curious temporal paradox: the further I advanced in real time and space, the more I seemed to lose myself in memory and daydream. There were times, for instance, on the walk, when I had the impression that past and present had entirely collapsed, and that I had magically returned to other landscapes which, for some reason or other, had, until that moment, remained hidden and out of reach' (Lavery 2009, p. 51).

This is an interesting observation that I too experienced. The walks seemed to conjure up thoughts, memories and experiences that for reasons that are not clear had indeed remained hidden or suppressed. Lavery, a British performer, continues making explicit the relationship between walking and autobiography and cites Hamish Fulton, a well-known artist and walker.

Fulton [...] draws attention to a perennial feature of waking: its ability to allow the subject to relive his/her formative experiences of the world. In this way, Fulton confirms the relationship that, I believe, exists between walking and Bachelard's notion of reverie, or what I have called enchantment (Lavery 2009, p. 51).

Just as the world unfolded before me in earlier years, walking was now providing a means of knowing the world and myself by being in it.

## Reservoir

But most of us live such fragmented lives and have so many minicommunities [sic] that no one knows us as a whole. The incomplete self longs for the fragments to be brought together. This can't be done without a context, a place. A starting point, for artists or for anyone else, might be simply learning to look around where you live now (Lippard 1997, p. 25).

Throughout my childhood and until recently I have moved from place to place, never staying in one place for more than five years at a time. 'Home' was anywhere and nowhere, but now it is *here*: Reservoir, a northern suburb of

Melbourne where I live with my family. In order to begin knowing something of this place, I decided to walk and create mappings of the surrounds. To structure these personal walks, I adopted a number of strategies to provide a framework. Firstly it was important to treat the suburbs as significant places. The suburbs have been devalued, or just ignored, as significant places – ‘throughout the twentieth century suburbs had heaped upon them the scorn of intellectuals and aesthetes enraged by their essential banality; their moral vacuity; their petit-bourgeois pretensions; their fundamental ugliness’ Gilbert (cited in Davison 2005, pp. 3-4) – despite the fact that the vast majority of western populations live in the suburbs, and in Australia ‘[s]omewhere in the order of 70% of Australians now live in suburbs’ (Davison 2005, p. 3).

Even the term *sub*-urban implies that these places are in some way inferior to the urban. Indeed, many dictionaries continue to record this term as derogatory. For example, the Australian Macquarie Dictionary defines suburban as ‘narrow-minded; conventional in outlook.’ But as Fishman (cited in Davison 2005, p. 3) reminds us, the origins of this term are ‘a reference to the deprived and lowly inhabitants of the slums that ringed medieval London.’

Karin Sander, a German artist, created a work that explores the edges of the city for the 2008 SCAPE Biennial of Art in Public Places. It ‘provides an opportunity for gallery visitors to vicariously wander the boundaries of the city’ (Industry 2009). Karin employed a walker to trace the circumference of the city during the course of the Biennial everyday from 10am-5pm. Inside the Christchurch Art Gallery a map was updated daily showing the path the walker traversed. This work played on the relationship between the centre and the periphery, encouraging visitors to activate their imagination and visualize the rich terrain beyond the limits of the Cultural Precinct’ (Industry 2009).

Most cities grow around the edges. They sprawl from the centre outwards. The edges of urban sprawl are areas of significant contestation as nature, agriculture, industry and housing needs compete. Careri points out that there is certain dynamism to the urban margins:

At the [urban] center time stands still, transformations are frozen, and when they happen they are so evident that they cannot conceal anything unexpected: they happen under the close surveillance and rigid control of the city. At the margins, on the other hand, we find a certain dynamism and we can observe the becoming of a vital organism that transforms itself, leaving entire parts of the territory in a state of abandon around and inside itself, in a situation that is difficult to control (Careri et al. 2002, p. 183).

A second important focus for the individual walks in my neighbourhood was to conduct them over the concealed routes of natural waterways. I became aware that many laneways or right of ways were being offered for sale by the municipality, and on further investigation, it became apparent that many of these right-of-ways were built over what were once natural waterways. The idea is related to the work of the UK-based collective 'PLATFORM [which] has been researching the Fleet, and refining this knowledge by walking the course of this river, through London from its springing-point ... to the point where the tributary enters the Thames. The walk is a meditation upon the course of this buried river' (Rendell 2006, p. 181): A meditation upon ancient systems that have been hidden from view.

Ledia Carroll, an artist based in the U.S, conducted another similar exposition for a lake:

On October 22, 2006, Ledia Carroll will use a field line chalker to recreate the full perimeter of Lago Dolores, a former freshwater lake that stretched from what is now South Van Ness to Guerrero and 15th to 20th Streets. Drawing the line in reference to maps from the 1800s, Carroll's chalkline allows the still visible ancient depression of the lake to become apparent to the eye (Carroll 2006).

*Yi-fu Tuan says that the terrain of late childhood seems to penetrate our lives and memories most intensely (Rendell 2006, p. 33).*

My own relationship with these drainage systems began with an obsession in the late 1970s with skateboarding. The focus was on non-horizontal surfaces to skate upon. Growing as an offshoot of the surfing culture in the USA, skateboarding became a way to 'surf concrete waves'. Popular skating locations in the USA included drained swimming pools, concrete pipes, and drainage systems, as Borden, a British academic and writer, has noted: 'Drainage ditches and other large-scale water-management projects formed another kind of architectural terrain which skaters could utilize' (Borden 2001, p. 40).

In Melbourne, we didn't have drained swimming pools with smooth contours to skate in/on, but we did have drains. As Smythe, an American journalist, describes:

The skating urban anarchist employs the handiwork of the government/urban corporate structure in a thousand ways that the original architects could never even dream of: sidewalks for parking, streets for driving, pipes for liquids, sewers for refuse etc., all have been reworked into a new social order Smythe (cited in Borden 2001, p. 177).

We searched for skating hot spots: '*mordy drains*' – a drainage channel; '*Eltham ponds*' – a drained concrete pond; the '*blood baths*' in Noble Park – more drainage channels; a concrete pipe factory that we had to trespass on to enter. This was not dissimilar to the experiences of skaters in the US according to Borden:

The drainage ditches were spatially distant from residential areas, found out in the interstitial infrastructural zones, accessible only from unknown (and often protected) entrance points (Borden 2001, p. 46).

These were the main places we knew. Hordes of skaters ventured to these locations in search of suitable surfaces. So it was with some nostalgia that I returned to drains, albeit in a totally different way.

My personal walks were thus conducted over routes that came from my research of right of ways, and ultimately submerged or covered natural waterways.

Once covered, these waterways do not appear on official maps. Their location is of no practical use to the person on the street. But perhaps this is just an assumption that is in the interest of the regulating authorities.

The water authorities responsible for maintaining these submerged waterways keep the only records available but these are of the pipes and other structures that have replaced the waterways<sup>15</sup>. By traversing these routes, I effectively created my own mappings, bringing to the fore a natural system that has been erased and absorbed into the dominant structure. Other artists that have investigated through walking, natural water systems that have been subsumed include *Kalch* (1998) by U.S. artist Julie Mandle:

*Kalch* (Dutch for chalk) was inspired by the history of the Collect Pond in Lower Manhattan, a five-acre natural pond that lay just north of what is now City Hall Park. Choked with pollution from the growing city, the Collect Pond was buried under a landfill in 1803.

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<sup>15</sup> Historical and geological maps may be able to supply information about the original course of these waterways. See Gary Presland, *The Place for a Village: How Nature Has Shaped the City of Melbourne*

Its former presence is marked by a small concrete park that is slowly collapsing due to an invisible layer of waterlogged soil below the surface. To bring Manhattan's lost pre-urban landscape back to life, Julia Mandle and her performers, wearing yellow chalk shoes, literally drew attention to the pond by outlining its former perimeter (Mandle 1998).

The decision to conduct walks over the concealed routes of natural waterways was spawned from browsing local newspapers and discovering that the local council had decided to close many laneways (Ulbrich 2008). These laneways were available to adjacent landowners for purchase. I felt this was an opportunity to document an aspect of my locale that would soon disappear. Closer investigation (looking at maps, contour maps, Google maps and satellite imagery) revealed that many of these ROWS followed the routes of old waterways.

I became interested in the way the function of these routes had changed over time. Beginning as natural water tributaries supplying fresh water and food to the Aboriginal inhabitants and early settlers, at some point they were covered over and used to provide sanitation and other services. Later, they came to their current transient status as right of ways (ROWS). Eventually they will be merged with private land.

These laneways are interstitial or in-between spaces and are 'interesting examples of ambiguity and multiplicity' (Galloway 2009), with the potential to reveal something about the character of a place through re-presenting, revealing often unseen aspects of a locale. For example, walking and re-presenting these spaces revealed their former state as natural waterways. These 'liminal or non-spaces are becomings and similar forms of transition, as well as hybrids, where relations between people and objects are in flux. Cultural theorists Gilles Deleuze and Félix Guattari describe related processes in their accounts of de-territorialization or becoming – which occurs along lines of flight that cut across states of being' (Galloway 2009). Walking, as described by Stavrides, a Greek academic and writer, below, is an ideal way to explore these spaces:

[W]alking ... can be described as a spatial practice oriented towards the recognition of in-between spaces, 'threshold spaces'. These spaces, in Simmel's words, connect while separating, that is, they produce out of discontinuity a new meaning of spatiality. The spatiality of such liminal spaces is the prime element of the walking experience. Liminality can be perceived and valued only if it is experienced in the process of walking through the city, discovering potential thresholds leading to unknown entrances.

...

Walking therefore must be considered as a culturally defined practice that is capable of orienting the individual towards otherness, destroying the continuum of habit (Stavrides 2001, p. 1).

The laneways, and indeed, the waterways which I have discovered that they cover, are examples of liminal spaces as described by Galloway and Stavrides above.

If we imagine a timeline of the waterways, we could start at a point where 'nature' – geology, geography, weather, plant and animal life, and their interactions – alone determined the course and function of these small waterways. The next major milestone would be the arrival of people some 30 to 50 thousand years ago. These people, whom we now know as the Wurundjeri, depended on these waterways to supply vital needs, and they were respectful and protective of them, and, apart from fish and eel traps, intervened relatively little (see Presland 2009). One hundred and eighty years ago, the European settlers arrived, and for these people nature needed to be controlled and channelled. One such waterway, Merri Creek, to which I have traced many submerged waterways, was the source of significant controversy in the early days of settlement.

Drainage became a major problem early in Preston's history, and led it into trouble with its neighbours ... [T]he 1888 Royal Commission on the Sanitary Condition of Melbourne had remarked that Merri Creek, far from being a good natural drain, as many local polluters claimed, was fouled by what went into it and, except after rains, had a sluggish flow. After rains it often flooded, carrying its noxious contents across land along its banks, leaving them behind when it retreated. The Collingwood paper talked of the 'stinks of Preston' (Carroll and Rule 1985, pp. 96-97).

The European settlers often significantly altered the course of streams, and eventually covered over the streams themselves, channelling the water they once carried into concrete enclosures or pipes. In some parts of the world, these submerged streams have taken on mythological proportions:

Miya Masaoka's *Quest for Minetta Creek* is subtitled 'The Search for the Last Living Natural Stream of Water in Lower Manhattan'. She writes:

'This piece explores the mythology and urban legend of the underground streams of New York City, and in doing so, the people and their relationships to the natural world. (Productions 2009).

The land above the now channelled waterways often became public land and/or ROWs. These and other laneways became available for many purposes. Mostly situated behind residences, and away from general view, they facilitated the servicing of properties. For many years, human waste was removed from the rear of properties via the laneways. Once sewers were installed the laneways started serving other purposes. They continued to allow access to properties from the rear, and provided alternative routes for local pedestrians who could cross the suburbs in ways not originally intended by planners.

Recently, many of these laneways have been put up for sale so that adjacent landowners can purchase parts of them and absorb them into their own lands. This isn't the case for all laneways, however, as many, in particular those that cover natural waterways, are owned by the water authorities. In other instances, a section of laneway may not be used/owned by one property owner exclusively, as it services many properties.

Disrupting habitual behaviour, as I mentioned in *Walking*, was another important consideration influencing the routes I selected.

According to Brian Massumi, identity is not a persistent, unified subject. Instead, our sense of ourselves is constructed from a multitude of memories, social as well as personal, felt, bodily experience, and the body's potential in any given context. Identity is 'a smeared becoming', a result of habitual tendency rather than concrete finitude (Craig 2006).

Following the courses of old streams, I found myself traversing routes not on any current, static map, and outside the grids of the road or transport systems. Thus I was able to avoid habitual, predefined routes and paths. Others have achieved this by walking to a predefined algorithm<sup>16</sup> – the classic version directs walking to a pattern of turns such as 'first street right, second street left, first street left and repeat' (Pinder 2005). This 'removes questions of goals, choice and habit in terms of route and in so doing opens space for surprise and the discovery of hidden significance. Participants frequently report the feeling that the smallest

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<sup>16</sup> This algorithmic method was influenced by generative approaches, many of which involve computer systems. Taken to its extreme, the artist group Social Fiction invented the Psychogeographical Markup Language (PML), a computer language written specifically for creating routes. (FICTION n.d.)

details and moments acquire new meaning as if in accordance to some strange pattern' (Pinder 2005, p. 397).

[Massey] gives particular importance to the potential surprise of space and to the encounter with the unforeseen, arguing for an understanding of the spatial that resists closure and stasis. It is an approach that emphasizes dynamic simultaneity, where space is in process and incomplete, where it eludes final determination and representation. Among experiments from art, architecture and cartography that she finds productive in this regard are those of situationist mappings. These not only defamiliarize standard representations of space through disrupting the coherent and continuous order of maps, but also reveal the fractures and incoherences of socially produced space through their basis in urban explorations, and leave 'openings for something new' (Pinder 2005, p. 390).

Attempting to follow the routes of old streams, I was often led out of the laneways, onto roads and parklands and sometimes otherwise inaccessible spaces (e.g. private property).

## Greece

Even if one's history there is short, a place can still be felt as an extension of the body, especially the walking body, passing through and becoming part of the landscape (Lippard 1997, p. 34).

The second locale I conducted walks in was my ancestral home of Lesbos, Greece. It is a place that I first visited in 1987, at the age of 24 and I have an ambiguous relationship with it. I am drawn to it for reasons that I am still trying to understand, but I am also repulsed by it. I felt that conducting some staged walks there might shed some light on these internal conflicts and give me a different, local perspective on my cultural background.

Kent Ryden isolates the sense of place as a specific genre of regional folklore, offering four 'layers of meaning' familiar to local residents but invisible to visitors, cartographers, and even scholars: local and material lore including local names for flora, fauna, and topography; handed-down history, much of it intimate, some of it apocryphal; group identity and place-based individual identity; and the emotions or affective bonds attached to place, which Yi-fu Tuan calls 'topophilia' (Lippard 1997, p. 34).

This handed-down history was immediately apparent in the bureaucratic nightmare surrounding my paternal grandparent's summer cottage, or *exohiko* ('out house') which had been brought about by changes to the land boundaries when Greece became part of the European Union in 1981. My fear was that we would lose this small property to a corrupt bureaucracy, as some years ago the Greek Embassy notified my parents that there was a court order for unpaid land tax.

In my grandfather's day, boundaries were based on trust, local knowledge, and lineage. No titles or plans existed, and disputes were usually resolved locally. As a result of joining the EU, support in the form of funds for farmers and agricultural lands became available. Many Greek farmers abused the system and declared their lands to be larger than in reality. One rumour has it that Greece needed to be three times its size in order to accommodate the lands declared by the

farmers<sup>17</sup>. (I have been unable to validate this rumour, and suspect that it is over exaggerated – although the current financial and political crisis in Greece suggests that there may well have been extensive rotting.) The EU then required all lands to be officially registered and measured. Somehow, my family’s *exohiko* had been caught up in a redrawing of boundaries.

Some light was shed on our situation when I visited the municipal offices looking for a map of the region. Initially I was told no map existed, but I insisted there must be a map for the land audits. A passing council worker overhearing my demands, told me the audit maps were wrong and needed to be recreated. Had my parents land tax liability been calculated from these erroneous maps? A few days later I received a call that a map (see Figure 1) had been found.

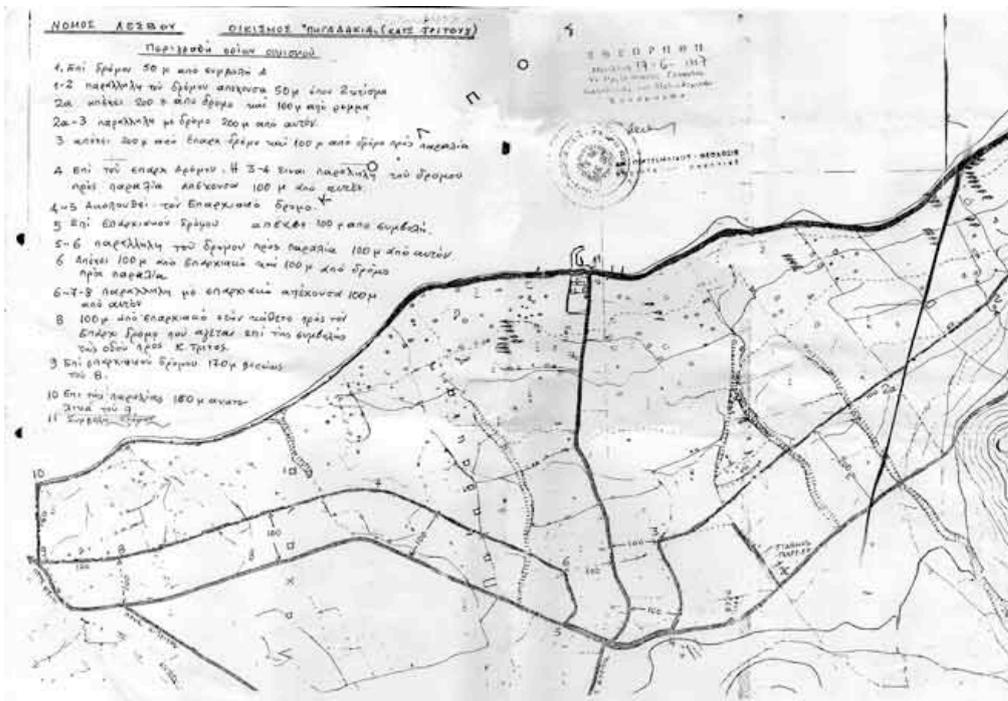


Figure 1 - Pigadakia Mud Map

The map turned out to be what my partner referred to as a ‘mud map’ dated 17 June 1987. Mud maps are usually hand drawn and not to scale. This particular map was to scale but had many hand drawn markings and text. If this was any indication of the information used to conduct the land audits, then no wonder

<sup>17</sup> Nearly a quarter of olive growers in Italy, Spain and Greece had declared at least 5% more olive trees than they owned, in some cases netting ‘significant’ extra EU cash. Greece came in for particular criticism as many of the much needed financial controls have still not been put in place - meaning that 850 million euros per year is paid to Greek farmers under ‘unsatisfactory control conditions’. They also found that some 50% of Greek sultana producers should not have qualified for the subsidies they were receiving. (EUROPE 2007)

there was so much confusion. Eventually, after much negotiation, we were able to clarify the situation and we were able to reclaim the house.

An extended stay for three months was greatly assisted by the free accommodation in this *exohiko* ('out house'). It is common for families to have their main residence in a village set back from the coast, and a small, humble *exohiko* closer to the sea in which they spend summer. These small, often single-room houses are generally surrounded by land used for produce or grazing and are now occasionally for use by visiting relatives.

The little house was accessible from the east and from the west via a pathway or right of way that passed the front gate. The beach and places we would access most frequently were to the east, but as this part of the pathway serviced no other property except ours it had been neglected and overgrown. It was impassable. So our only access was to the west, the long way round, and in the intense heat of the Aegean sun it was a chore. A neighbour had notified the municipal offices asking that this right of way be cleared before our arrival but nothing had happened. Several phone calls later a lad arrived with a brush-cutter; after 15 minutes he was called to another job. The Captain, our closest neighbour who had spent 30 years at sea, insisted the lad leave the brush cutter behind to guarantee that he would return. Hours later, in frustration, the Captain armed himself with the cutter and started to clear the right of way. I followed closely behind removing what he had cut. In an hour or so we had cleared the path. We walked this path ritually everyday for three months.

In relation to Lesbos, I focused on several key ideas: the underlying rhythm of life on the island, walking as part of the religious rituals of pilgrimage and how sound might be incorporated as part of the mapping process.

In preparation for the trip, I had revisited the myth of Orpheus<sup>18</sup> and its relevance to Lesbos. Thinking of Orpheus, I constructed a wind harp that was made through a process of experimentation with branches from a fig tree that had overtaken the front yard and then a thick grape vine branch, bending it using twisted twine for tension, immersing it in warm water to soften the wood, and using the heat from the sun. Over a period of several hours, I carefully bent the branch into a 'u'

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<sup>18</sup> One story has it that Orpheus' lyre that was washed up on the beach, did not get buried like his head, but sat upright embedded in the sand. As the wind blew, the lyre began to sing sweetly and tragically. This was heard by nightingales that subsequently learned to sing it with the same pathos. The people heard it too, and subsequently introduced and taught lyrical poetry and music to all of Greece. (MYRIVILIS 1956, pp. 270-271)

shape. The harp held its shape using twine and a section of wood for the bridge.



*Figure 2 - Constructed Harp*

The intent was to record the sound of wind on the harp in various locations around Lesvos in order to produce a sound mapping. Only one performance was possible and this took place in the village of Erresos, as part of a summer festival where the wind 'performed' the harp and the recording of this performance can be found in the Topophilia mapping.

It was possible to include sounds in the mapping process as the system was now able to cope with other media of video and sound being transmitted using MMS. I was interested to see if 'considering such diffuse forms as sound [...] could allow us to see other possibilities for considering how maps might operate' (Rosenbaum 2001, p. 58).

The harp relied on the weather, the wind, to produce a sound, and so I too had 'to give myself over to weather' (Murphie 2004, p. 2) as did Cage, an American composer, music theorist, writer, and artist with his *Whether/Weather* piece. I had proposed the work as an experiment and the proprietor of the venue was happy to accommodate this. The first performance took place at 2pm, Tuesday, 17 September 2008. There were some difficulties working with the house PA system, but generally the result and response were positive. A highlight was when a wasp settled on the strings and its vibrating body modulated the harp's own output. Many passers-by stopped to talk and were intrigued by the instrument and the sound being produced. The proprietor asked me to return later that evening for a second run.

I arrived at 8pm to find the venue crowded. Had word spread? We had not advertised any of this as it was an experiment and the results were unpredictable.

Unfortunately, there was absolutely no wind! Perhaps I should have set up and let the audience enjoy the silence. I decided to 'give myself over to [the] weather' as did John Cage with his *Whether/Weather* work:

Here again we need to broaden the notion of a medium. To put it rather bluntly, networked media signal the end of the traditional delimited (and broad) notions of media we have known for the best part of a hundred years. We perhaps need more malleable concepts of media, such as found not only in media ecology, but in many artists' work, such as John Cage's 'playing' of an amplified cactus needle with a feather, or his piece *Whether/Weather* (1992). In the latter, the piece was to be performed outdoors and simply cancelled if it rained. Cage said 'I am willing to give myself over to weather. I like to think of my music as weather, as part of the weather (Murphie 2004, p. 131).

There is a rhythm of life on the island that I wanted to incorporate into the work, a rhythm of movement, of daily and seasonal rituals that lend themselves to the rhythmic aspects of walking. As Csordas, an American academic and writer states: Rhythm is a powerful aspect of becoming present to oneself and the world – a kind of 'being-in-the-world' (Csordas, 1994: 9–10). In an effort to be in this new world, I attempted to tap into the rhythms of life through participation in daily activities, such as the late afternoon 'peripato' and religious rituals of pilgrimage or 'tamata' (votive offerings). During an earlier visit to Greece, I had observed a ritual that was foreign and subsequently discovered that this was in fact the evening *peripato*:

At about 6:30pm, as if by appointment, the entire populace will emerge from their doors, dressed in the Sunday best, fresh from the afternoon siesta ... It is the hour of the peripato, the evening stroll - a custom that has played a vital part in Greek life for centuries (Gage 1983, p. 41).

From the beginning of July, after the schools have closed, people slowly make their way from the village to their summerhouses or *exohiko*. By mid-July, most of the occupants have 'come down'.

The return to the village coincides with the beginning of the school year when the weather starts to freshen. By late August, the *exohikos* have almost emptied, and most people have 'gone up'. Those who are left do so because they run businesses from the summer places (tavernas mostly), and so live there for the remainder of the year.

During their time at their *exohikos*, most people follow a very similar daily routine, seemingly dictated by the weather and social mores. 'Rhythm is both inner (of the body, of the mind) and outer (of the social, the collective, the walking together), and crosses between these two' (Slavin 2003, p. 11).

As the sun is intense from about 10am onwards, most people rise early to take advantage of the cooler mornings when they tend to the many tasks and household chores. The lands are also used for growing crops, mostly for personal use and distribution amongst friends and relatives. Apart from abandoned properties, I have yet to find a property without a vegetable garden. Tomatoes, red, luscious, dense like meat, many seeds travelling as far as the gardens of Greeks in Australia, they are so prized and sought after; pumpkins and assorted zucchinis, eggplants, beans, plums.

Punctually at noon, the locals head for the beach and stay in the water for around an hour. All opine that seawater is good for the health. This opinion is a recent phenomenon, as the sea was once considered a hostile and unhealthy place. Until relatively recent times, this particular bay was heavily polluted and supported very little life. Several older locals who had lived through these changes relayed this to me. Myrivilis, a well-known writer from Lesbos, once referred to this bay as 'the most beautiful bay in the world' (Myrivilis 1956, p. 260) but he wrote this before a tanning industry had almost destroyed the bay.

At 1pm all the beachgoers disappear into their homes for lunch. This is followed, for many, by siesta. This leaves energy for the late night revelling that is also common in summer. After siesta, many venture out for a late afternoon walk or *peripato*. This ritual we practiced daily. I learnt a great deal from these ritual walks. They opened up many possibilities through haphazard encounters and chance meetings. These in turn affected the course of the research and subsequent walks, which in turn unfolded more possibilities. '[F]luid movement can be seen to open up individual experience to new and different ways of perceiving and designing the world – offering subjectivities that can shift and sway according to their context' (Phillips 2005, p. 2).

Walking in Greece has strong connections to religious rituals of pilgrimage and during my stay I made four extensive walks as pilgrimages, the first to the church of Agia Marina on 17 July 2008, in celebration of Saint Marina.

## Agia Marina: Walk one

Those who made vows (tamata, also votive offerings) may make all or part of the two-hour walk from the village to the site 'barefoot and silent' (ksipoliti ke mungi), often using staffs to help them along. To those obviously on their way to the festival, particularly to anyone with a pilgrim's staff, a passer-by gives the greeting voithia sas (your help [may the Panayia<sup>19</sup> be your help]) instead of the usual time-of-day greeting. ... I have never seen any of them crawl on their knees or stomachs to the church (as Dubisch [1990: 120] described for Tinos) (Boissevain 1992, pp. 156-158).

Greek Orthodox churches are built in honour of a saint. The small church dedicated to Saint Marina was located approximately 4 kilometres south of our house. We were able to walk most of the route along the foreshore, but had to walk along the main road for the last kilometre or so. My mother had called earlier that day asking if I was able to light a candle in honour of the saint that saved us! My mother's reasoning was that as an accident that the whole family was involved in 34 years earlier, had occurred on this saint's day, our survival could be attributed to this saint.

## Kato Tritos and Beyond: Walk two

On 6 August 2008 I attempted to walk a route given in the Lesvos Walking Guide (Anderson & Anderson 2007) that would take me through my father's village, Kato Tritos, through the neighbouring village, Mihou, and into the mountains beyond.

I had walked a small part of this route during my first visit in 1987 and remember ascending the mountains via a dirt road into what seemed at the time a lush cool forest. I decided to not walk further, realising that I was heading into relatively unfamiliar terrain, but vowed to return and complete the walk.

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I had planned to start earlier, but it was already 11 am and hot. I missed the correct turnoff and ended up climbing higher than necessary. The trail map from the guidebook started to lose relevance; nothing seemed as described.

I experienced a diverse and exceptional landscape during this walk, and was on my own for the majority of the time. I thought about how this walk reflected my relationship with my father and how he had been absent for so many years. How

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<sup>19</sup> The Virgin Mary

I had felt alone for much of my youth. Although I strayed from the intended route, I was exhilarated that I had made my own way, and that, despite being lost at times, I was able to negotiate the terrain using my wits. I had become one of Don Quixote's 'errant knights':

Only the 'courtiers,' or caballeros andantes of the Court, says Don Quixote, travel all over the earth merely by looking at a map, whereas the 'real' errant knights, who are exposed night and day to the inclemencies of the weather, take the measure of the entire globe with their feet without looking at ninerias or childish trifles (Bosteels 1996, p. 109).

Perhaps this is a metaphor for my personal negotiations with life as a second generation Australian. The intended route, the expectations of a parent trying to lead a life as he knew best: navigating life without a guide. I was obviously not ready for this walk into the hinterland in 1987. I needed to grow before I could venture into this emotional territory.

The walk was unsettling and arduous, but there was some relief. At regular intervals I came across water fountains, which both cooled my heated body and replenished my thirst. I imagined great plumes of steam rising from my body as I cooled at the water fountains.

In a grand finale, the whole audience gathers outside to see Winters take off about a dozen layers of thermal clothing: he has been cooking in there. Then we chuck water over him in order, as Whelan cries like some P.T. Barnum's charlatan, to create our own cloud. ... That's why we're interested in inserting ourselves into the weather system. You can billow these great sweat steam clouds, which is a very nice ending to what we do (Bunbury 2005).

I finally emerged from the mountains five hours later and made my way to the nearest village for some food and a rest. On the final leg, I noticed many discharged rifle cartridges, a discarded pair of old worn shoes and, portentously, a sign announcing the funeral of a person that bore my name. (My name is quite common in this region). Death brings a new beginning, a shedding of the past, and an embracing of what is to come.

Ermotilia: Walk three

During the evening 'peripato', we often visited an elderly couple, Mr and Mrs Tsounas, whose summer exohiko faced the beach. Mrs Tsounas told me that her mother and my grandmother were first cousins. (I have many distant relatives on

this island.) They also informed me that their son, a doctor, had written several books about the island, the second of which they then gave me as a gift. It contained an interesting history of the village my mother came from, Filia, which we were planning to visit the next day for an extended stay. I discovered that the original inhabitants of Filia lived further up the mountain in a village called Ermotilia – derived from *Erimopileon*, a conjunction of the words *erimos* (desert) and *pileon* (gate or gateway): the gateway to the desert.

Approaching the village, it becomes clear how this name came about. The road climbs into the mountains from the town of Kalloni at the head of the island's second-most prominent bay. The mountain appears like a wall, sheer and impenetrable. A small shoulder punches through revealing the vast expanse of the west of the island that is, indeed, desert like. At the base of the mountain, in the low-lying valley, the first village that comes into view is Filia. Ermotilia is further up the mountain, well hidden from the east, in a horseshoe-like depression surrounded by a ridge to the west, north and south. It is thus well concealed and naturally fortified, providing necessary protection for the villagers of Ermotilia against threats from sea-borne invaders. During the reign of Gatelouzos<sup>20</sup> (Tsounas 2007, p. 66), the villagers no longer needed the protection offered by this site and descended into the valley below that offered more land and resources.

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Filia, my mother's village, is in the centre of the island. My Uncle Thrasivolo and Aunt Thalia live there with their children and spouses. Aunt Thalia is the youngest of the siblings, so as tradition dictated, she stayed behind to care for her parents in their old age. Uncle Thrasivolo was given the option of joining his other siblings in Australia but chose to stay in the village and eke out a living from farming.

Both have endured many hardships in their lives.

Aunt Thalia works in a women's co-operative<sup>21</sup> making beautiful traditional sweets. This was an enterprise created to assist the women of the villages whose employment opportunities are severely restricted. It also serves to retain these traditional practices, and cultural tour groups often visit the co-operatives. Aunt

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<sup>20</sup> Lesvos witnessed many difficulties until 1354 when Francisco Gatelouzos of Geneva, son-in-law of the great Byzantine Emperor Ioannis Paleologos, took over the island as part of a dowry. He led the island through calm waters until Ottoman Turks took over the island on 14 October, 1462.

<sup>21</sup>This has been recently documented by local students and can be seen on youtube at [http://www.youtube.com/watch?v=5sHzbS4Sras&feature=youtube\\_gdata\\_player](http://www.youtube.com/watch?v=5sHzbS4Sras&feature=youtube_gdata_player) (last accessed 17/02/2012)

Thalia bemoaned the lack of younger women in the group and saw this as an indication of the eventual loss of these aspects of the culture. The peak work period is over the summer, so she was disappointed she could not spend more time with us.

One morning, before she left for work, she found me gazing at the mountains surrounding the village. She pointed to an outcrop on the neighbouring mountain to the north. She explained that the farmers use this to tell the time: when the shadow disappears, it is midday. Early cartographers made important discoveries from the shadow cast by the sun. For example:

the Massaliote [Pytheas] made observations in broad daylight as well, the first person to have related the latitude of a place to the length of its longest day ... His only tool was a gnomon or sundial, a simple device ... essentially an upright stick designed to measure not a thing but the shadow of a thing, more specifically the sun itself (Olsson 2007, p. 27).

While staying in Filia, I planned to seek out the remains of the old village, Ermotilia, from where the original inhabitants of this village came. As outlined above, I had serendipitously the day before, received a book written by a local doctor describing this ancient village. If it were not for our regular walks, I would not have met this couple nor procured the book that they so kindly gave me, nor have any idea of this history.

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During this walk I reflected on my mother's journey. She left her village at the tender age of 18 to join my father in Australia. He had arrived three years earlier with the intent of finding work and establishing a base. In the subsequent years, my parents assisted their siblings to immigrate to Australia.

Many years later they decided to return to Greece to retire. This was mostly my father's desire as he had never been able to settle anywhere for any extended period of time. They sold up their assets and set off to a new life in Greece. They struggled, as do many who return to their ancestral homes after living abroad for many years. My mother described it as her second exile. They lasted six years. Their decision to return was compounded by the fact that my brother had become ill. My mother returned to Australia vowing to never go back to Greece, whereas my father continued to vacillate. He did make one more attempt at returning on

his own, but this lasted only two weeks despite his vows to never return back to Australia; casting a black stone behind him.<sup>22</sup>

The walks that related to my parents bore a significance that was not apparent to me until I returned back to Australia. They had both been seriously ill whilst I was away, and in the meantime I had been conducting walks with them in mind. As Andrea Phillips has noted, walking has associations with healing:

To walk is literally to re-place ones body in an actual sense and yet to be involved in an activity closely associated with magic, healing, penance, pilgrimage and transcendental flight (Phillips 1997, p. 13).

#### Agiassos: Walk four

The second most important religious pilgrimage in Greece (after the pilgrimage to the island of Tinos) is to the village of Agiassos, on the island of Lesbos. The main church, *Panayia I Vrefokratousa* ('Madonna Holding the Infant'), holds a famous and venerated icon. The history of this village is inseparable from the history of this icon which was brought by Agathon who built a hermitage which later became a monastery. This site is now a very important place of worship and pilgrimage. As is stated in the history of Agiassos, 'Two pilgrimages to Agia Sion were equivalent to one pilgrimage to the Holy Land' (THE HISTORY OF AGIASSOS n.d.). A full description of the history is included in Appendix 5 The History Of Agiassos.

I had discussed the route options for this pilgrimage with many of the locals, trying to find a route that would allow me to take my partner and daughter. Many of the pilgrims take the mountain tracks, from the back of Mixou or Karini, but it became clear this would have been impossible with a pram as the track, an old cobble-stoned donkey path (known as a *kalderimi*) cut up the mountain in a straight line. So we decided to follow the main road from the crossroad on the other side of the village, Ippio.

Our first stop was at the village of Karini where we stopped for half an hour or so, to rest and replenish our supplies. There were many pilgrims here, but this was the last we saw of most of them. From Karini, the *kalderimi* begins its ascent up the mountain. Later we realised that the majority of the walkers had taken the traditional path and this explained why from this point onwards we didn't see

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<sup>22</sup> This is a Greek expression I have heard used often to denote that the thrower is intending to never to return.

many others on the road, which was disappointing. Throughout the walk the peak of the mountain above the village was always visible giving reassurance, but as night was beginning to fall, we were concerned that the road had no footpath and cars, buses and motorbikes were speeding past.

After two and a half hours, mostly up hill, we arrived in the village. The scene was chaotic; swarms of people were massed outside the main entrance waiting to enter the church and pay homage to the venerated icon and many elderly people were camped inside the church grounds for the night as it is considered very beneficial. This was our first sense of 'communitas', which we had not experienced on the journey due to not taking the traditional route for walkers. Here the sense of occasion was palpable, and we spent several hours simply observing and resting.

Later that evening, in conversation with friends of the family we discovered that most people took the *kalderimi*, even an 80 year-old grandmother. The reason being that the walking was paramount to them; without it there was no sense of pilgrimage.

## Collective Walks

Benjamin argued that "the collective has an intelligence which rivals that of the private individual." Utilizing the distributed model of the crowd in spatial works reverses the dominance in liberal humanism of the private individual and taps into an alternative power similar to the hive consciousness of bees and ants (Craig 2006a, p. 13).

This project initially set out to provide a platform for collective expression through walking, mapping the routes(s) through photography and the mobile phone and gathering the data at a central location. The interest is in works that leverage communications technologies to support collaborative/participatory projects where the participants provide the content, for example, the photos taken on a mobile phone captured by the walker(s) and delivered to a central point.

The combined use of computers and telecommunications systems has been referred to as *telematics*. As a result, the early art works engaging these technologies were referred to as telematic art. These works usually require a defined structure or framework provided by the initiator of the work, or context creator, in many instances an artist. This reduces the privileged position of the artist who acts more as a type of facilitator rather than the sole and exclusive creator of works.

This is a characteristic of many telematic, collaborative works, and represents a shift in the roles and responsibilities of the artist, and was in fact a problem for many artists in the early days of telematic art.

To the linear model of communication, which privileges the artist as the codifier of messages (paintings, sculptures, texts, photographs), telematics opposes a multidirectional model of communication, one where the artist is creator of contexts, facilitator of interactions. ... [T]he artist (context-creator) that produces telecommunication events sets a network without fully controlling the flux of signs through it. The artist working with telecommunication media gives up his or her responsibility for the 'work', to present the event as that which restores or tries to restore the responsibility (in Baudrillard's sense) of the media (Kac 1992).

This restoration of the 'responsibility of the media' and the creation of a collaborative event were important aims of the project. Baudrillard argued that

the 'mass media [...] fabricate non-communication—this is what characterizes them, if one agrees to define communication as an exchange, as a reciprocal space of a speech and a response, and thus of a responsibility' (Wardrip-Fruin & Montfort 2003, p. 280). The adherents of Telematic Art have promoted a utopian vision through the raising of consciousness that participants experience when engaging with this type of work:

Ascot claims [...] that the activity of distributed authorship (a process during which the work emerges as an interactive collaboration amongst participants) evokes an experience of collaborative consciousness, a fusion of individual consciousnesses dispersed around the planet into an integrated whole (Shanken 2005).

Ascot's (an American artist) predictions were written well before the advent of the Internet. Since its inception, there has been a flurry of artistic activity under the name of Net.Art picking up from the activities of the Telematic artists. In the meantime, other issues such as the commercialisation of the web, the influence and control of information by government bodies, censorship, the digital divide, information overload, and more, have dampened the utopian enthusiasm. Ascot himself has also come under some criticism for his 'techno-utopianism' (Ferneding 2005, p. 8). Nevertheless, as a collaborative medium, the Internet has proven exemplary. Diverse and geographically dispersed groups have established networks and communities, facilitating collaboration in an unprecedented way. The phenomenal rise of Web 2.0 applications alone is testament to this. This project relies on this network to reach a large audience, and to allow the authoring and editing of content of an essentially 'open work':

What such works have in common is the artist's decision to leave the arrangement of some of their constituents either to the public or to chance, thus giving them not a single definitive order but a multiplicity of possible orders (Eco 1989, pp. ix-x).

More recently Dr. Nikos Papastergiadis (Professor, Cultural Studies and Media & Communications) has noted that the 'shift from the position of the artist as producer, to the artist as a collaborator in the construction of social knowledge, not only leads towards consensual representations of other people's reality, but also redistributes agency in the production of social meaning. ... [A]s artists redefine their function as "context shifters rather than as content providers", they become more intimately involved in the production and mediation of new social knowledge' Kester (cited in Papastergiadis 2008).

Peripato Telematikos is a creative practice research project that generates new knowledge in the manner described above by Papastergiadis. In the case of the collective works, it is the participants themselves that are the main creators of new social knowledge through their walking, observations and perceptions, and the collaborative documentation they generate.

My first exposure to collective telematic works was by way of Rafael Lozano-Hemmer's (a Canadian-Mexican artist) *Vectorial Elevations*<sup>23</sup> (Lozano-Hemmer 2000). Since then I have created several works that rely on public participation and telematics, this project being the most recent.

Hemment, a British artist, curator and researcher observes that 'projects such as Urban Tapestries (UK), [murmur] (CN) and Area Code (UK) explore how multiple layers of meaning may subsequently be inscribed, in a form of collaborative authoring or collective memory, complicating any simple realism by the multiplication of perspective' (Hemment 2004).

Jake Barton, a New York-based designer, creates public maps that generate social interaction, personal expression, and collaborative storytelling. Barton's work is centered on performance, drawing attention to the performative capacity of maps, a seldom-explored facet of cartographic design and theory. Examples of Barton's projects, realized and unrealized, are detailed, with a focus on the manner in which maps are designed to evoke performance (Krygier 2006, p. 41).

Jake Barton's work is of significant interest as it is one that combines mapping, collaborative authoring and performance, areas that this project engages with and combines.

Telematic works aside, works that engage a collective are by no means a new phenomenon, and many of the issues surrounding these practices can equally be applied to telematic works. Papastergiadis gives an excellent and concise historical overview of collective practices in the art world:

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<sup>23</sup> Vectorial Elevation was a participatory, interactive art project originally designed to celebrate the arrival of the year 2000 in Mexico City's Zócalo Square. Large spotlights situated on top of the buildings surrounding the square could be configured by the public through a custom web site.

At first glance much of the art that focused on social relations, political activism and urban interventions in the late 1990s appears to be on a continuum with earlier artistic experiments in community building, protest actions and street life. Collectives and collaborative art production were a feature of Dadaism, Surrealism and Constructivism in the early parts of the twentieth century, and then revived in the 1960s in Fluxus, Conceptual, community based, muralist and feminists art movements. Lucy Lippard (2007: 408) has recently declared that 'the greatest legacy of the 1960s (which took place in the ensuing decades) is the community based arts'. At that time, artists like the Brazilians Helio Oiticica and Lygia Clarke had already devised techniques for reaching out to new audiences and including them as part of the construction and experience of the work. Oiticica and Clarke used the slogan 'individuality within collectivity' to redefine both their affiliation with communities and the process of co-production. They argued against the modernist tradition of art as an autonomous object and promoted the idea that the work of art finds its affirmation in both the active experience of the public and the reclamation of the networks by which objects and knowledge circulate. These generous tendencies, which influenced pioneers of Conceptual art such as Cildo Meireles, and subsequently found expression in the European and American contexts, lead to what Lippard called a 'retreat' from the institutional contexts of art. Community art and public art projects were often motivated by a disavowal of the artwork as a commodity and a rejection of the art institution's separation from everyday life (Papastergiadis 2008).

What distinguishes these early collaborations of the 20th Century from contemporary practices seems to be related to the convergence of several contemporary issues. Firstly, the availability of a global communications network has facilitated these practices to be 'the first truly global movement in art' (Papastergiadis 2008). As has been discussed above, this was predicted earlier by Ascott (Shanken 2005) well before the advent of the internet as we know it today. Secondly, the socio-political transformations associated with neo-liberalism and more importantly the reaction to this. Kanarinka sees this as an act of cultural resistance: 'The collective can be thought of as an act of cultural resistance in that the group functions as a refusal of an increasingly engineered individual subjectivity' (Kanarinka 2006, p. 28).

Thirdly, there is a strong emphasis on both local and global conceptions. As Papastergiadis has noted, '[t]hese artistic practices and curatorial strategies simultaneously pose the need to identify local civic needs alongside cross-cultural, regional and even global conceptions of human rights' (Papastergiadis 2008).

In place of the grand recits of past political movements, which figured the collective as a universalizing abstraction, contemporary groups present pragmatic, localized strategies that provide alternative models of collective and collaborative agency based on affinity, friendship and shared commitment (Kester 2009).

There are many examples of collective artistic practices that have been noted by cultural commentators to support these claims, and a subsequent search for terms to define these practices. Papastergiadis has identified the following: *social aesthetic*, (Okwui Enwezor, former director of Documenta XI), *inter-local*, (Long March collective in China), *connective aesthetics*, (British critic Suzi Gablik), *dialogical art*, (American academic Grant Kester) and *relational aesthetics*, (Nicholas Bourriaud).

Nicholas Bourriaud's (a French curator and art critic) book, *Relational Aesthetics* (1998/English version 2002), provides a comprehensive survey of the myriad art practices that address 'the concept of art being defined by social interaction, by co-ordinated or impromptu acts of participation that may or may not require specific locations in and times at which to occur' (Tofts 2005). Bourriaud highlighted the prevalence of this way of working in contemporary art. It raised some debate about the criteria by which the art is judged. A London art critic, Claire Bishop raised concerns that these works were being judged only on their ability to create participation, and not as art:

For these and other supporters of socially engaged art, the creative energy of participatory practices rehumanizes—or at least de-alienates—a society rendered numb and fragmented by the repressive instrumentality of capitalism. But the urgency of this political task has led to a situation in which such collaborative practices are automatically perceived to be equally important artistic gestures of resistance: There can be no failed, unsuccessful, unresolved, or boring works of collaborative art because all are equally essential to the task of strengthening the social bond. While I am broadly sympathetic to that ambition, I would argue that it is also crucial to discuss, analyze, and compare such work critically as art (Bishop 2006).

Bishop continues to give many examples where 'authorial intentionality (or a humble lack thereof) is privileged over a discussion of the work's conceptual significance as a social and aesthetic form' (Bishop 2006). This critique of relational aesthetics did not go unnoticed. In a response to Bishop's article, Grant Kester, an American academic and writer, writes that the effect of Bishop's

approach is to naturalise 'deconstructive interpretation as the only appropriate metric for aesthetic experience' and that 'she [Bishop] might consider the "uncomfortable" possibility that her own version of the aesthetic is simply one among many' (Kester 2006). These tensions arise from the adoption of ways of working that differ in significant ways conceptually and aesthetically from art practices that have come before. Both Bishop and Kester acknowledge that there are precedents and perhaps it is through looking at this lineage that we may be able to come to a better understanding as to how to judge such works.

Papastergiadis questions the role of the critic in this debate, and asks:

Surely the task of the critic is to go beyond either a dismissal of every principle because of the whiff of artistic opportunism, or participate in a premature celebration of the promised utopia, but rather it [sic] to evaluate the capacity for collaborative art to redefine its aesthetic materiality in the way it 'traverses' the subjectivity of diverse groups of people (Papastergiadis 2008).

Papastergiadis has observed a 'source of considerable critical irritation' in that on the one hand collaborative art practices are seen as exploitation of others by the artist and on the other hand naïve in their valorisation of 'humanist ideals of sharing'. He suggests that the focus should be on evaluating how collaborative art is able to redefine its aesthetic materiality, given that the work encompasses the subjectivity of diverse groups of participants.

In researching this turn in contemporary art practices, I was struck by the lack of critical discourse on the subject, given its prevalence and widespread adoption. Kester provided a clue as to why this may be happening:

Critical and theoretical engagement with this work has been constrained by a number of factors.

First, many historians and critics remain wedded to definitions of artistic practice that are considerably less radical than those embodied by the artists themselves. This is evident in the tendency of mainstream scholarship to focus primarily on collaborations among and between "artists" rather than those collaborative projects that challenge the fixity of artistic identity per se (Kester 2009).

Kester raises an interesting point that reflects my own experiences with this project. Namely, that a collective artwork can only be created by a collective of artists; hence collective art works cannot be referred to as 'art works' if they are

not made by 'artists' alone, that is, if they involve 'non-artists'. If this attitude prevails, then works created by non-artists, no matter what the context or structure will never be deemed art, and hence, never receive the critical reflection and commentary reserved for art proper! Perhaps this is also related to the difficulty that the established art world has in dealing with such multi-authored works, which go against the 'modernist myth of the loner-artist-genius so capitalized on by galleries and museums alike' (Craig 2006b). Kester argues for a less routine approach:

The most promising direction for new critical research into collaborative art will come from scholars less invested in the routinized application of unexamined theoretical tropes, and willing to begin their investigations from an open and searching investigation of the specific conditions of a practice that operates across the boundaries of phenomenology and social theory, cognitive and somatic knowledge, and aesthetics and ethics (Kester 2009).

Peripato Telematikos sought to investigate a way of collaborative art making that engaged the participants in a new view of their environment enabling the production of collective narratives about place.

My approach to the collective works was to adopt a methodology that gave participants a voice. I was conscious of not speaking for or on behalf of the participants but of creating a context enabling them to 'speak' for themselves. I did not want to impose an 'issue' or purpose of enquiry. This is a social/community aim.

For example, the group *megafone.net* (a non-profit social communication project) is a practical example of how digital communication technologies can be appropriated for giving voice to social issues. This group works with groups from many parts of the world to give them a voice and have observed that:

Beyond the fact that defining common interests can be quite a difficult task, even for a small group, the model for establishing topics a priori blocked the way for the bottom-up emergence of shared themes through the everyday practice of content publication. [...] Considering that the megafone.net projects are usually limited in duration, we felt the need to redesign the project's dynamics so that common themes could emerge a posteriori, that is, through the participants' actions and not before them (Tisselli 2008).

As an outsider, having spent little time in the place that the workshops were held, I did not feel it my place to dictate the terms of their 'speaking'. In saying that, I am conscious that distance can often be an advantage in making judgements, as one might be more objective. But in these instances I was more concerned with giving the participants an opportunity to speak for themselves.

Those who act and struggle are no longer represented, either by a group or a union that appropriates the right to stand as their conscience. Who speaks and acts? It is always a multiplicity, even within the person who speaks and acts. All of us are "groupuscules." (Foucault) Representation no longer exists; there is only action—theoretical action and practical action which serves as relays and form networks. [...] only those directly concerned can speak in a practical way on their own behalf (Deleuze and Foucault 1972, pp. 3-10).

The effectiveness of this approach has been documented in a review by one of the participants of the Townsville mapping. This review appeared in The Queensland Community Arts Network Inc Bulletin (Vol 15, No 9, November 2007). I have included the full text in Appendix 3 Townsville Workshop Review, as evidence of the participants' opinion of the process undertaken and as an indicator of the success of allowing the participants to speak for themselves.

One of the best outcomes was to work with an artist like Greg who really facilitated this project in a very modest manner. He let the participants run the project and this was empowering for them (Armitage & Silva 2007).

The following are reflections on four examples from the collective works. Each one is examined in terms of the preparation and processes undertaken and outcomes achieved: Townsville, Brisbane, Adelaide and Portable Worlds II (ANAT).

## Townsville

14 September – 7 October 2007. Umbrella Gallery, Townsville.

Planning for this exhibition and workshop, from the initial proposal submission, to the actual event took 8 months. The director of the gallery, Vicki Salisbury, sent out invitations for participation to the local community and despite a last minute change of date, the workshop attracted participants from a wide cross-section of people, including secondary school students, teachers, artists and local council representatives.

The workshop began with a talk to give background information and a context for the project. It comprised a short outline of the background and research, the major influences and strategies. The proposed exhibition included a map of Townsville and I initially invited the workshop participants to annotate this map with personal information, using sticky notes. The intention was to provide a counter-point to the mapping we were about to create and to bring to the fore the idea that the static representation is fixed in time, and that additions of subjective material would eventually cover the entire map rendering it chaotic and unworkable.

I then gave the participants the mobile phones I was able to supply and instructed them on their use. Together, we then worked through the following stages:

- Each participant was given a map of the area surrounding the gallery, along with a string that was 3km long by the scale of the map. I then asked each participant to create a 3km route (approximately an hour's walk), with the assistance of the string, and mark this on their maps.
- These maps were then redistributed at random, so that the participants would be following a route devised by another local. I allocated an hour for each walk and the participants headed out. I waited in the gallery, approving the photographic content as it arrived, ensuring it was suitable for public view.
- After an hour, the participants returned, and we all viewed the results. Some participants followed their routes so literally that they ended up on the third floor of a city building, others commented on the fact that they had discovered something new about their place, despite having lived there for years. (See review in Appendix A for further comments).

- The final stage was the organisation of the photographs into a visual map. Three participants were keen to undertake this and with some instruction, along with the necessary password they completed the design mapping outside of the workshop.

The strategies for the collective workshops, included disorienting the participants by giving them a map that was unfamiliar, asking them to walk a route devised by others and allowing the participants to speak for themselves. I did not anticipate the discussions and dialogues that emerged after the workshop, and this is something that I need to factor into any future workshops. As observed by the megaphone.net collective,

Establishing topics a priori blocked the way for the bottom-up emergence of shared themes [...] we felt the need to redesign the project's dynamics so that common themes could emerge a posteriori, that is, through the participants' actions and not before them (Tisselli 2008).

Fortunately, I was able spend time with the participants after the workshops in a less formal environment, and it was there that many topics emerged. For example one artist drew my attention to a statue situated in the path that he walked and how it brought home to him the significance of this memorial. The statue, he informed me, was highly contentious and often vandalised. It was a memorial to one of the founders of Townsville, a person who is now known to have incited much racial hatred in the community. Apparently his eyes are often vandalised. This topic, I have discovered since, is a highly charged issue in the Far North of Queensland, where indigenous, and imported labour communities were subject to some of the most atrocious acts of racial discrimination.

Another participant, an art student, who bursting with enthusiasm after the walk, commented how she followed the route designated to her as best she could. This led her to the third story of a building she had never ventured into which offered her a distinctly new view of Townsville.

These comments were most satisfying as they exemplified what much of the literature discusses in relation to this type of performance, i.e. that the walking 'would prompt other stories of the places passed through' (Heddon 2008, p. 101). Furthermore, it seemed to me that this could become a 'model for ethical community or participatory performance where the content or "script" of the

piece is largely dictated by the spectators' or in this instance the participants themselves (Heddon 2008, p. 101).

Just as Smith cannot predict the paths his walking will take, so too are the stories, he tells and the connections he makes between them chance encounters. Though his walking is supposed to return Smith to his childhood, on the beach Anjali tells him that she has been reminded of her own childhood (Heddon 2008, p. 109).

It was difficult to incorporate these topics back into the mapping, as I had not anticipated these outcomes and had therefore not prepared. I feel that this was a missed opportunity to embellish the mapping with the issues that were raised through the walking, providing a richer mapping for subsequent audiences.

Further issues were raised in a review (see Appendix 3 Townsville Workshop Review) written by two of the participants: Pia Armitage, a teacher and a practising artist with a focus on community arts projects and Claudia Silva (visiting from Brazil), a psychiatrist working in mental health care who had previously been involved in community arts projects. This was published approximately one month after the event.

Participants found that one of the greatest outcomes of the workshop was the opportunity to interact with each other, and 'realising how closely our paths crossed in the community' (Armitage & Silva 2007). Through the walking, they realised how closely their lives were intertwined. Many had not met each other before, and yet there was a very strong sense of connectedness. Participants reported that the project highlighted their sense of community and belonging to this place; 'we were literally in the picture' (Armitage & Silva 2007).

Commenting on the process itself, the participants found that it was great for 'building a sense of belonging' (Armitage & Silva 2007), and the realisation that the technology could in fact be 'used to bring people together, instead of intimidating them' (Armitage & Silva 2007). I made great efforts to ensure that the use of mobile phones was not going to be an impediment to the process, and receiving this feedback gave me confidence that I had succeeded in not intimidating the participants with the technology as can often be the case with many participatory media art projects. This was facilitated by a number of factors that influenced the project as a whole. In summary, the technology relied upon for participation made use of what are ubiquitous facilities, namely a phone with a

camera and MMS capabilities. There was no reliance on 'apps' or any other type of customised mobile phone application. This strategy was adopted to maximise the potential for participation, or as Pia put it, 'there were no prerequisites for participating and the technology was made accessible for everyone'.

This reinforced the ability of the project to inspire the participants and help them realise that technology can be accessible.

Students in Pia's classes (many new arrivals in the community) were inspired and empowered by the whole process and outcome and went on to be involved in other community art projects that involved making use of a Wikispace where they share photos, discussions and commentaries on their experiences. The simple act of walking proved liberating for some of the migrant participants. Had the migrants come from a place where such a simple act was fraught with danger and walking was not possible without fear of their personal safety? For many that live in places that 'are increasingly hostile to pedestrians, walking tends to become a subversive act' (El-Azma 2009).

These comments, the mappings and the enthusiasm generated were very satisfying outcomes demonstrating what could be achieved by creating an open project, one where there are few restrictions and *a priori* assumptions.

One of the best outcomes was to work with an artist like Greg who really facilitated this project in a very modest manner. He let the participants run the project and this was empowering for them (Armitage & Silva 2007).

Pia commented that one of 'the biggest challenge[s] was the animation [configuring the images in the interface] that involved some technical knowledge of how to use the computer program'. What surprised me was that the participants were able to accomplish this with very little intervention from me, which gave me confidence in the usability of the interface, despite it being a relatively unfamiliar interface to work with for most computer users. I spent approximately 20 minutes describing the features to the participants, who then went away and worked with the interface to design their layout without any further assistance.

Brisbane

25 - 28 November 2007. Create World Conference, Griffith University, Brisbane.

I was invited to this conference after presenting a paper a few months earlier at an affiliated conference and was given half an hour during the conference proceedings to introduce the project and call for participants from the audience. I set up a stall near the entrance to the auditorium and participants came of their own volition.

I gave participants a mobile phone (some chose to use their own) and a map of the region. Unlike Townsville, I allowed participants to decide their own route and marked this on the map. Many of the participants were from out of town, so their routes would have been unfamiliar, eliminating the need to devise an unfamiliar route for them. As participants submitted entries I approved them immediately, enabling a live creation of this mapping in real time.

The major theme of this conference was computer-mediated collaboration and creativity, so this project fitted well within the program. To engage the conference attendants, the organisers created blogs, wikis and other collaborative web environments. My participation was finalised after arrival, and this created some planning problems as there was no opportunity to survey the site prior to the conference.

Nevertheless, it was a good opportunity to experiment with conducting a collective mapping in a new context and with a different approach to that which had been conducted in Townsville.

The participation exceeded my expectations and generated a great deal of enthusiasm from the participants, many of whom were from out of town.

It was the first time that the project had received over a 100 entries and this exposed a major limitation of the software that I had not anticipated.

The online component of this project was originally conceived as a Java applet. In brief, this is an application that is *embedded* in a web page in a similar fashion to the more common Flash object. As the entries started to pile up, the applet stopped functioning, as it did not have sufficient memory to cope with the amount of content. I discovered that this was a serious limitation of applets and there was no way to allocate more memory. This required a major reworking of the software. The software was eventually realised as a Java Web Start application — effectively an application that can be launched from a web page. This solved the memory problem as Java Web Start applications can be allocated more memory. Alas it opened up other problems relating to the way the many different browsers

(i.e. Internet Explorer, Firefox, Safari, etc.,) deal with the launching of Java Web Start applications. This has proven more complex to resolve, and I have as yet to find a fail-proof solution.

Unlike the Townsville workshop, there was no opportunity to engage in any way with the participants after the mapping, apart from seeing their invigorated faces when they returned borrowed phones and/or maps.

Given the lessons learnt from the Townsville workshops, it was a major disappointment to not be able to engage with the participants after their walks. This is not atypical of a conference situation where attendants are on differing schedules, time frames and may have other commitments.

Other comments related to the conceptual premise of the mappings. Some more technically inclined participants asked if I was to take the mapping software to 'the next level'. When I asked what they meant by this, they suggested that I should use GPS to link the images to the physical places from which they came. This question arose several times and I had to explain that GPS and the base-map had been omitted intentionally (please refer to section Cartography for an explanation as to why this was so), although I suspect that without the theoretical underpinnings this concept may not have been understood that well. What was significant to me was the fact that many could not comprehend the idea of a mapping without the familiar base-map upon which to pin everything, or the exclusion of GPS.

One participant was concerned that there was no provision for colour correcting the images sent from their walk. I found this a rather odd request, until I realised that the participant was a well-known photographer who had some concerns about the representation of their work in the mapping.

These comments were not surprising given that the conference had a strong technical and educational focus.

The issue of authorship arose in a number of contexts. I had initially wanted the mappings to be malleable by all audiences, not just the mappers. The intent was to provide a space that allowed the 're-mixing' of content in ways that are not too dissimilar to contemporary 'mash-ups', 'thus giving them not a single definitive order but a multiplicity of possible orders' (Eco 1989, pp. ix-x).

This option has now been removed as it created considerable usability issues and confusion. There needed to be a clear distinction between using the interface for authoring and viewing. What was interesting was the anxiety displayed by some of the participants who were concerned about their mappings being manipulated by others, in effect losing control and ownership of the photographs and the mappings.

## Adelaide

2 March 2008. Adelaide Fringe Festival, Adelaide, South Australia.

This project was part of the 2008 Adelaide Fringe Festival and as such was advertised along with all the other events. Participants from diverse backgrounds attended the workshop.

I used the same strategies as in the Townsville workshop however an exhibition did not accompany the workshop so we were unable to work with a static map as had been done in Townsville.

Most fringe festivals that I have been involved with have an open-door policy. All works are generally accepted, the festival organisers providing marketing and advertising services for a small fee. My greatest difficulty was locating a venue to host the workshop and because this workshop was part of the Adelaide Fringe Festival it was competing with hundreds of events. As a result participant numbers were low.

Each iteration of this project brought with it new insights. Media arts students, arts festival curators, artists and a young girl (10 year old) attended this workshop. As I handed out the phones, the young girl quickly took a photo of her mother, and set it as wallpaper on the phone. She had never seen this particular model of phone but was so comfortable with the technology that she was able to quickly learn how to complete the abovementioned task. This generation will certainly provide new insights into the use of these technologies.

In relation to this young girl's quick adaptation of the unfamiliar technology handed to her, during the course of this project, I had many conversations with educators interested in using the project as a means of engaging their students. I give a presentation at the annual VITTA (Victorian Information Technology

Teacher's) conference in 2007, discussed and designed professional development workshops for secondary school teachers with the head of VITTA, Renée Hoareau, (see Appendix 4) and had several discussions with the Paul Van Eeden, Project Manager, at Thornbury Secondary College.

After the walk, one of the media arts students commented that he had discovered a small market that he had been unaware of despite having lived in the city for many years. In all workshops, this enhanced perception of place was a consistent experience of the participants.

The two media arts students were interested in the final organisation of the mapping content. They were allocated passwords and set about this task in their own time. They were able to accomplish this with very little intervention from me, which gave me confidence in the usability of the interface, despite it being a relatively unfamiliar interface to work with for most computer users.

## Portable Worlds II

This project was selected to be part of The Australian Network for Art and Technology (ANAT) Portable Worlds II touring exhibition of mobile phone works. The website was exhibited alongside other works that make use of mobile phone technology in some way. The works were exhibited in the following regional galleries:

Supper Room Gallery - 17 March - 14 April 2008. Streaky Bay, South Australia.

Academy Gallery - 9 May - 5 June 2008. Launceston, Tasmania.

Latrobe Regional Gallery - 17 June - 17 July 2008. Morwell, Victoria.

Albury Regional Gallery - 10 October - 7 December 2008. Albury, New South Wales.

24HrArt Gallery - 1 April - 20 May 2009. Darwin, Northern Territory.

I took this as an opportunity to experiment with another mode of engagement. I created simple instructions and a local map for participants. Likewise, I gave the gallery staff instructions as to how to facilitate participation.

The exhibition of media art works in galleries has and still presents some problems. Many galleries are used to exhibiting static works (e.g. images,

sculptures, etc) but accommodating new media is problematic as they are expected to provide facilities above and beyond their usual practices. They often do not have the infrastructures in place to allow for these types of works restricting the possibility of the exhibition of contemporary works that engage or rely upon, for example, the internet.

One gallery reported issues with the project's need for an internet connection. They wanted to be able to download a local copy of the work, so as not to have to rely on an active internet connection. This was not how the project was intended to be shown and would eliminate any possibility of a live mapping. It further highlighted a lack of understanding about the intent of the project. Firstly, there would be no mapping of the local area when the exhibition is first opened and as a result, no content to download and display for the local mapping. Secondly, without an internet connection it would not be possible for local participants to create a mapping.

As Graham and Cook have noted:

How to exhibit online art is clearly a quandary for gallery curators: one computer hooked to the net and a projector sounds easy enough (Graham & Cook, 2002).

Even the Townsville exhibition was challenging despite months of planning. The projector provided for the exhibition was discovered to be close to the end of its bulb life.

Lack of participation was the biggest issue with these exhibitions of the work. As I was unable to give introductory workshops at these venues it was difficult to know how the work and the material provided to facilitate participation was presented, and what support the gallery staff was able to provide. The organiser of the touring exhibition, commented that, from her experience, the exhibition of mobile phone works in a gallery setting can be problematic. The online mappings for these iterations show many images from the relative location that the ANAT staff member that was responsible for overseeing the installation of the exhibition submitted whilst walking the places hosting the exhibitions. As no other contributions were received, the mappings are effectively those of a single walker. This outcome was disappointing and highlighted the need for a personal introduction to the project.

## Software

This project could not have been realized without the research and development of custom software. This involved research and development of an experimental interface prototype based on the ZUI paradigm (discussed in greater detail in the section on Interface). Furthermore, I have researched the relationship between art and software, discussed my own poetics, and related to this, the cultural significance of software.

### Software Development

This project utilizes telecommunications technologies to implement the functionality required. Walkers use a mobile phone to record their experiences, and to transmit the media. An MMS/SMS gateway receives the media and transports it across the Internet to a database residing on another server. There, a Java Web Start application<sup>24</sup> interrogates the database and loads the relevant constituent components of the mappings. This application allows for manipulation of the mappings in a myriad of ways. Implementing these functions has required me to research, design and develop software. The interface component of this software, as mentioned previously is referred to as ZUI. The software system as a whole, which incorporates ZUI and a myriad of behind-the-scenes functionality will be referred to as Telematikos.

Software is the instruction that a computer requires in order to carry out any of its functions. The computer is a complex hardware system incapable of doing anything without software. It is the software of the operating system that tells the computer how to start when the machine is first powered, what to do when the user clicks the mouse over an icon, and how to negotiate communications over the Internet. The software is what makes the computer function. Developing Telematikos for this project forms a significant part of the research.

The technical aspects of Telematikos are discussed in detail in Appendix 9 The Software/Hardware System.

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<sup>24</sup>An application written in the Java language that can be launched from a web page.

## Software Art

Artists have investigated software writing as a form of artistic practice since as far back as 1970 when art historian Jack Burnham curated the exhibition, *Software. Information Technology: Its New Meaning for Art* (Shanken 1998). Lev Manovich, an artist, professor, and director of the Software Studies Initiative reflects on the importance of artists writing software:

Enter a software artist [...] Instead of working exclusively with commercial media – and instead of using commercial software– [the] software artist marks his/her mark on the world by writing the original code. This act of code writing itself is very important, regardless of what this code actually does (Manovich 2002).

I have had to write significant amounts of code in order to realise this project. There was no available software, commercial or otherwise, that would fulfil the needs of this project. Therefore, the act of code writing was of the utmost importance, as it allowed me to realise an application that is unique and tailored for this project.

In 2004, whilst attending the *Ciberart Bilbao International Festival*, I met with Antonio Cerveira-Pinto<sup>25</sup>, artist, curator and writer from Portugal. During a lengthy conversation, Antonio reflected that in his opinion, software would replace the image as the 'lingua franca' of art in the 21st century. This comment inspired and encouraged me to continue pursuing software writing as an art practice and solidified my understanding of the importance of software in the 21<sup>st</sup> century. Furthermore, it reminded me of an important software art *All Picture Generator* (allpicturegenerator.com n.d.) which proposes that given enough time a computer program could synthesize all possible images. His website contains many writings on this topic, and the Media Art Net site (Arns 2006) provides further discussion on Software Art and examples of this practice. Amy Alexander, an artist, reflects on the role of software art and culture:

[S]oftware art is a response to the ways mainstream software influences culture (Alexander 2008, p. 1).

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<sup>25</sup> <http://www.chroma-kai-symmetria.ws>

For this project the important 'act of code writing' has been integral to this project allowing for the creation of the online system, i.e. the Telematikos application through which the mappings are viewed. As an artist working with software I am interested in not only providing the necessary functionality, but conducting experiments that can aid in the development of new types of software, interfaces and experiences. This required research, design, and implementation through writing software. As an artwork, the interface, the visible component of the software, needed to be integrated with the content, so that unlike conventional software, there is a strong relationship between the content of the walks, the mappings and the medium through which the work is viewed:

In contrast to design, in art the connection between content and form (or, in the case of new media, content and interface) is motivated; that is, the choice of a particular interface is motivated by a work's content to such degree that it can no longer be thought of as a separate level. Content and interface merge into one entity, and no longer can be taken apart (Manovich 2001, p. 67).

The choice of interface is motivated by the content as Manovich states. In the case of this project, the interface was developed to facilitate the viewing of the mappings.

In order to situate the poetics of my software practice I will provide a brief overview of the current status of software art. A number of distinct categories have emerged and I will reflect upon which of these categories my software poetics aligns with mostly.

As mentioned in the section Collective Walks there was a flurry of artistic activity under the name of Net.Art picking up from the activities of the Telematic artists. Those working in the field of Net.Art, started shifting towards work with software, and as a result, software manipulated or written by artists.

Critical observers described these works as "Artware" (Saul Albert in 1999), "experimental software" (Tilman Baumgärtel), "speculative software" (Matthew Fuller), "artistic software" (Andreas Broeckmann) and "software art" (Alexander Galloway, 1999) (Andersen 2004).

These artists had first taken software as a transparent tool, and later began to reflect on the influences that these tools had on their own work and aesthetics. They became aware that the aesthetic form was determined by the invisible hand of a few operating systems, e.g. Windows or Macintosh, or proprietary

applications that act to co-opt diversity into recognisable forms, aesthetically shaping and limiting individual creativity (Nunn 2007). As artists worked more with the computer, the alleged tools became more problematic - not because of some "objective" limitation, but because of the culture, philosophy and subjectivity imposed by the creators onto the users of the software (Cramer 2006). What distinguished Software art from purely functional software, is that software art does not only use the computer and the software as a tool but addresses the computer, its code and its software directly. How the tool affects the way you use and what you create and how the tool itself can be an expression became fundamental concerns of many software artists. With this project, the software enables the documentation and viewing of collective and individual walks.

Distinct categories of software art practice have emerged:

1. Artists have explored mass media as a cultural phenomenon since the 1960's. Many software artists have adopted this concern as they ask what it means to perceive the world through software. This is a timely investigation as the world is being imbued with software on many levels. In this case, software art is endeavouring to examine the influence of software on our culture.

How is software shaping, and being shaped by, cultural and political practices? Lev Manovich has written extensively about this aspect. In his popular book, *The Language of New Media*, he investigates the computer interface and the ramifications of its design. He states that 'far from being a transparent window into the data inside a computer, the interface brings with it strong messages of its own' (Manovich 2001, p. 65). For example, as we peruse our file systems, we are confronted with a world structured hierarchically, and this is the organising principal of the desktop GUI paradigm. On the other hand, traversing the World Wide Web presents a world connected, rhizomatically. These rhizomatic connections are invisible or not apparent, giving us no sense as to how the pages and content we view are interrelated.

This notion of software shaping our practices has influenced the design of this project. The interface was designed with the intention of breaking from the hierarchical limitations ingrained in the desktop GUI, in order to offer an alternate possibility for the organising of content and subsequently, the way the 'world' is connected and displayed. Furthermore, ZUI breaks with both of these conventions

(i.e. hierarchic and rhizomatic connections), imposing no ordering paradigm on the content. The content is 'connected' by spatial association. Content that is related can be clustered and viewed as a group, clearly expressing their relationship through spatial proximity. Furthermore, these spatial associations are mutable, potentially allowing each interaction with the mappings to be unique. There is also a temporal relationship between the constituent components. Each of the components is time-stamped, with the date and time of transmission, making it possible to ascertain the temporal order of the components. This allows for the 'playback' of content, effectively allowing viewers of the site to view the content as it was generated.

Just as software can affect our view of the world, it can also shape our practices. Australian academic and writer Mike Leggett, and Australian artist and academic, Les Walkling writing in the photographic art magazine *Photofile* discuss the problem of how commercial software 'shapes' what can be created. Leggett examines the monopoly that the Adobe product, Photoshop has on digital image manipulation: 'For the digital darkroom to be defined by one corporation challenges the diversity of solutions that other toolmakers can offer' (Leggett 2000, p. 29). Walkling critiques this same software from a fine-art photography perspective, claiming that a great deal of knowledge around the processes of fine-art photography have been lost due to the domination of Photoshop.

How do we get around the domination of such powerful corporations that determine what and how we do with much computer software? In order to lessen the domination and power of the monopolies to shape our practices, it is important to provide alternate ways of working. This is one consideration that has shaped my own practice. Albeit a small contribution to a much larger problem but nevertheless still a contribution.

2. Software art may also be considered as artistic experiments that display software in a different way. A well-known example is *Netomat(TM)* by artist Maciej Wisniewski (Rhizome | Netomat 2001), a web browser that presented web content in a unique and non-functional way, exposing aspects of the Internet that were hidden from the casual user. This strand of software art, through its experiments, can often aid in the development of new types of software and interfaces.

The software poetics of Peripato Telematikos best aligns with this strand of software art as through its experiments, it can aid in the development of new types of software and interfaces. The interface was designed with the intention of breaking from the hierarchical limitations ingrained in the desktop GUI, in order to offer an alternate possibility for the organising of content and subsequently, the way the 'world' is connected and displayed. The software breaks with the normalised conventions of hierarchic (exemplified by the desktop GUI) and rhizomatic connections (as the Internet is organised), imposing no ordering paradigm on the content. The content is 'connected' by spatial association. Content that is related can be clustered and viewed as a group, clearly expressing their relationship through spatial proximity.

3. Software art can also be strongly political. In this case, software art draws attention to how software works socially and politically and has a didactic perspective trying to preserve a democratic, transparent and open society. An example of this is the 'free software' that has at its core the agenda of improving software transparency.

In order to examine this issue of software transparency more closely, it is necessary to look beyond the interface to the software that controls the look and functionality of the interface and the invisible underlying systems and this has become an area of discussion within software design:

Paradoxically, while social scientists, philosophers, cultural critics, and media and new media theorists have by now seem to cover all aspects of IT revolution, creating a number of new disciplines such as cyber culture, Internet studies, new media theory, and digital culture, the underlying engine which drives most of these subjects—software—has received little or not direct attention. Software is still invisible to most academics, artists, and cultural professionals interested in IT and its cultural and social effects. (Manovich 2008, p. 5)

In February 2006 Mathew Fuller who already published a pioneering book on software as culture (*Behind the Blip, essays on the culture of software*, 2003) organized the very first Software Studies Workshop at Piet Zwart Institute in Rotterdam. Introducing the workshop, Fuller wrote: "Software is often a blind spot in the theorization and study of computational and networked digital media. It is the very grounds and 'stuff' of media design. In a sense, all intellectual work is now 'software study', in that software provides its media and its context, but there are very few places where the specific nature, the materiality, of software is studied except as a matter of engineering" (Fuller 2006).

Manovich and Fuller's comments are significant and raise some very important issues. Computer and telecommunications technologies have permeated our society, but it is the software embedded in these systems that controls the hardware and consequently plays such a vital role in modern society. Given this state of affairs, it is surprising that software has received so little attention from cultural commentators. Perhaps this is because of the 'black box' nature of software: users are generally not privy to the software itself, only what its designers intend them to see. Users are expected to unquestioningly trust that the 'black box' performs functions that the creators claim. In 1987, William Bowles author of *The Macintosh Computer: Archetypal Capitalist Machine?*, wrote about the risk of the loss of transparency from the likes of the Macintosh computer:

[M]any people have raised serious objections to the "black box" approach used by machines such as the Macintosh, arguing that by making the machine into a closed system it not only reduces the range of choices open to the user, but perhaps more importantly it encourages a particular attitude towards machines in general by mystifying the processes involved, which in turn leads to a state of unquestioning acceptance of the supremacy of technology. This is of course a process which began with the industrial revolution (Bowles 1987).

Raising the question of transparency leads us to ask, are there situations where the software may be performing functions unbeknownst to the user? This is, of course, common with computer viruses and other types of 'malware'. What of instances where these have not been detected, or detected but not reported? Many organizations—for example, banks—have a vested interest in keeping customers ignorant of security breaches in their computer systems. And what about situations where companies may be using their software to report on users' activities? On a State level, Sanger writes that:

American intelligence agencies could activate malicious code that is secretly embedded on computer chips when they are manufactured, enabling the United States to take command of an enemy's computers by remote control over the Internet. That, of course, is exactly the kind of attack officials fear could be launched on American targets, often through Chinese-made chips or computer servers (Sanger 2009).

Given the power and ubiquity of software it is important that it be subject to critical analysis and, as Alexander argues, that people develop some 'software literacy':

Think of software literacy as an extension of media literacy. People [would be] (hopefully) taught how to detect bias in newspapers and television—even if they don't know how to produce a newspaper or television program themselves. Now that software is a mass medium—one that influences people's lives at both consumer and institutional levels—might not it be useful if people learned to detect software's biases (Alexander 2008, p. 4)?

The Free and Open Source Software (FOSS) movement, in which the software source code is freely available, and generally written collaboratively, has made some in-roads towards opening up the black box.

With this project, I intentionally make use of open source, non-proprietary systems wherever possible and release all the code I have written. The software is written in the Java programming language. The Java language itself is open-source (Martens 2006) and was developed with the intention of being non-proprietary and able to operate across all platforms. Therefore, the black box is opened, as the software platform upon which the system is built is open-source and all the software written by me is released.

More pressing are the political implications of software. How much power is vested in software? Although this aspect is of lesser significance to the software for this particular project, I feel that it is a logical extension of the concerns and issues thus far raised and therefore important to discuss. This project as a whole empowers people by providing the opportunity to create their own knowledge through subjective cartography. The software simply facilitates this in an unobtrusive manner, whereas much software that purports to empower users does so at a cost and often with competing agendas. The Google search engine is an interesting case study. Computer users have become so reliant on this search engine, that the expression "google it" has become commonplace as an answer to finding any information. But who controls Google, and what types of algorithms does it use to produce its page rankings, and what political pressures must it succumb to? Google's rankings are produced through PageRank; according to Google:

PageRank relies on the uniquely democratic nature of the web by using its vast link structure as an indicator of an individual page's value. In essence, Google interprets a link from page A to page B as a vote, by page A, for page B. But, Google looks at more than the sheer volume of votes, or links a page receives; it also analyzes the page that casts the vote. Votes cast by pages that are themselves 'important' weigh more heavily and help to make other pages 'important' (Google 2008).

The abovementioned text from the Google site gives a very simplified explanation for how Google ranks pages, and it refers to its process as 'democratic'. The higher a page ranks, the higher up in the search results it will appear, giving those pages significant advantages over others. It's worth noting two things here: 1) the apparent objectivity of the process (it's an algorithmic process) and the 2) hidden anthropomorphism ('the page that casts the vote'). We need to be mindful of the simple fact that the algorithm is produced in the software and that subjective humans write all software.

Furthermore, Google is silent about how these rankings are affected by the censorship that Google has complied with under pressure from various governments (e.g. China, Germany and France) and corporations? (Lenssen 2006) In these circumstances, how can the page-ranking algorithm be 'democratic'? Alexander (2008) argues that perhaps this ranking system is more akin to how popularity is determined in the playground. She continues, 'and even though Google assures us that "Google's complex, automated methods make human tampering with our results extremely difficult," (Google) we can keep in mind that humans determined the automated methods in the first place.' As mentioned previously, this project as a whole empowers people by providing the opportunity to create their own knowledge through subjective cartography. The software facilitates this in an unobtrusive manner, whereas much software that purports to empower users does so at a cost and often with competing agendas.

There are other examples that alert our attention to the subjectivity of software and the dangers that this entails: the fiasco surrounding the introduction of electronic voting systems in the USA, and the alarming lack of transparency of this system, computer programs that use automated procedures to determine the eligibility status of tax refunds for the poor, as an article in the *The New York Times* reported:

[A] computer program selected the returns as part of the questionable refund program run by the criminal investigation division of the Internal Revenue Service (Johnston 2006).

What is of concern is the culturally accepted attitude that prevails: 'It was a computer fault', which conveniently absolves any persons of responsibility, despite the fact that humans determine the rules and write the software.

How do we battle the power vested in software? Opening up the black box as discussed earlier is one such strategy, thus providing transparency for all to see the internal workings of the software, operations that are usually well hidden from the user. I attempted to address this issue by incorporating a mechanism whereby some of the internal operations of the software were externalised. For example, when the software is 'listening' for new entries, this was conveyed to the user through a simple scrolling text box. I believe that this is only touching the surface of what can be made transparent, and would need significant more development to provide full software transparency; a project in itself.

Furthermore, it would require that users be more critical of the software that they use in a similar way that the public is or can be critical of the media they are exposed to. The writing of software in an art context provided an opportunity for addressing this and other issues, but as was revealed through useability tests, this inclusion detracted from the main aim of the project and confused users and was thus eliminated from the interface.

4. As is the case with many other art forms, software art can intentionally work with and examine its own materiality. As an algorithmic art form it is often used to explore notions of generative and artificial life systems. A local example is the work of Australian software artist Jon McCormack. He has developed works exploring artificial life such as his 1995 work *Turbulence* (McCormack 1995). In other instances, artists are using the code as an expression in itself, such as the work of Australian artist Mez who creates poetry using the semantics and syntax of programming and scripting languages.

[A] number of works that took radically different approaches to the form and interface of fiction [such as] Mez's the *data[h!]bleeding texts* written in her particularly styled mutation of human and machine language (Rettberg 2012).

The work *World of Awe* (1995) by the artist Yael Kanarek is an interesting and influential example of software working with its own materiality. In this work, Yael subverted the conventions of interface design to embed personal and subjective designations for standard interface paradigms. This work influenced some of the early designs of the interface. I attempted to subvert user interface conventions by using naming conventions for drop down menus that reflected aspects of the work rather than the usual functionality accessed through these menus. Useability tests confirmed that this was unsuccessful as it only added more confusion to an interface that is unfamiliar to most computer users. As a result, this strategy was abandoned for the sake of usability, as it detracted from the main focus of the interface, being to provide a means by which an audience is able to view and navigate a mapping.

My software poetics have also been strongly influenced by my experiences whilst working as a software design engineer. In this environment, I was introduced to Object Oriented<sup>26</sup> methodologies for the development of software, and various visualisation tools to facilitate the understanding and communication of Object Oriented systems. I was struck by the simplicity of conceptualising the 'world' as a collection of objects that would share some common characteristics, while differing in their detail.

Software visualisation tools use graphical techniques to make software visible (Ball & Eick, 1996).

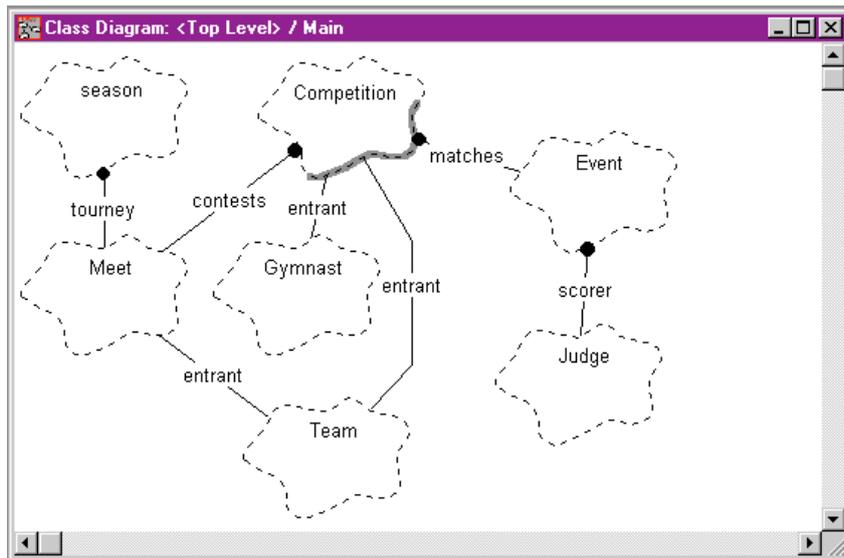
Diagrams of the overall structure of conceptual software models are used in the design of most software systems. These have proved so invaluable that all software design methodologies incorporate some form of visualisation as part of the development, conception and for documentation. For example, the following class relationship diagram is a visualisation of the initial design concept for a gymnastic competition register system. It shows the object classes and relationships between those classes using the Booch Method.<sup>27</sup>

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<sup>26</sup> Object-oriented design is the process of planning a system of interacting objects for the purpose of solving a software problem.

It is one approach to software design.

<sup>27</sup> "The Booch Method is a means of developing and communicating the design of a system that will be implemented primarily in software". (White, 1993)



*Figure 3 - Class Diagram*

The software objects are shown as clusters (e.g. "Team" cluster). The lines (or links) between the objects indicate the relationship(s) between the objects. Visualisation is crucial in a software development environment as the programming code is so abstracted that it alone does not suffice as a useful medium for the communication of the conceptual structure of the software.

In relation to this project, the 'objects' are the constituent components of the mappings. They all share some common attributes, but differ in their detail. Treating the items as objects allows for a common means by which to engage with these items. The items can all be selected, scaled, repositioned, resized and associated with other items in a common way. In this sense, no item is treated differently because of its content. Similarly to the object-oriented paradigm described above, each item's content and functionality can be different. In this project's case, the objects can contain text, images, sound or video.

I have developed software in both commercial and artistic contexts. In a commercial context, satisfying the functional requirements is paramount and there is little room for any conceptual speculation relating to subjectivity. In an artistic context, there are opportunities for exploring the important issues raised previously. This project is primarily about walking as an art form and this has been its key focus. Development of software was required to facilitate the project. This presented an opportunity to explore software subjectivity issues, despite this not being the prime focus of this project. I discussed these issues in order to

situate my attempts, failed or otherwise, to investigate these concerns through the software written.

Many of the attempts to engage with the abovementioned issues through the software in previous versions of the software and in particular the interface, have been removed after considerable feedback from usability testers. The main reason being that the devices used often simply confused the user and were not seen to add to the usability of the interface as a whole or detracted from the main focus of the project.

## Interface

The term 'interface' seems to have been borrowed from chemistry, where it means 'a surface forming a common boundary of two bodies, spaces, phases.' In computing, interfaces link software and hardware to each other and to their human users or other sources of data (Fuller 2008, p. 149).

Like software, an interface is considered neutral and objective. But also like software, interfaces can be highly subjective and have a cultural significance. Interfaces are only a small part of the software that a computer user interacts with. The invisible aspects of software perform a myriad of functions usually unbeknown to the user (except when a 'fault' arises).

I have developed the interface solely for this project. It allows the display and manipulation of the mappings and their constituent items in a manner that breaks from proprietary conventions, and facilitates the viewing and mutability of the mappings. The interface implements the zooming interface paradigm (Raskin 2000), and as such is termed a zooming user interface or ZUI as opposed to a GUI. For brevity, I will refer to the interface as ZUI.

I discuss ZUIs in order to give some background and understanding of this type of interface. I have provided criteria that the interface must fulfil in order to ascertain whether the interface satisfies its intended use. The design of the interface has been critically evaluated using an established methodology for usability and the results provided.

### Zooming User Interface.

The desktop interface paradigm has been part of computing since the advent of the graphical user interface or GUI as it is commonly known. Developed at Xerox PARC labs and adopted by Apple, the GUI has seldom been challenged. The desktop metaphor relies on a computer user's familiarity with the physical office desktop. It organises content in a manner that is analogous to the use of paper documents and physical filing systems. Documents are stored in files, which are stored in folders. But as folders can also be stored in other folders, this can create a complex, branching, hierarchical archive that can be difficult to track and organise. Documents become hidden within deeply nested folders, requiring the user to remember these complex pathways to their documents, or at least to be

highly organised. It is no surprise that the use of search facilities (e.g. Spotlight functionality in OS X) has become a dominant mode of locating content in a computer's filing system, and the extended filing system of the World Wide Web. An indication of how embedded this way of working has become in our culture is the often heard expression 'just google it'.

If the metaphor/analogy for GUI is a desktop viewed from a single, stable height, the metaphor/analogy for ZUI is a project planning room, where items of interest are tacked to the wall(s). These can be sticky notes, photos, texts, etc. In order to see the 'big picture' an observer steps back to take in the whole wall. If a detail needs to be examined, the observer steps forward to get a close up of that item. Likewise, with ZUI, in order to see the overall picture, the user zooms out and to see an item in greater detail, the user simply zooms in. The following quote, from the original developers of the first ZUI implementation *Pad* may assist the reader in understanding the motivation behind ZUI's:

#### The Pad Metaphor

Imagine that the computer screen is a section of wall about the size of a typical bulletin board or whiteboard. Any area of this surface can then be accessed comfortably without leaving one's chair.

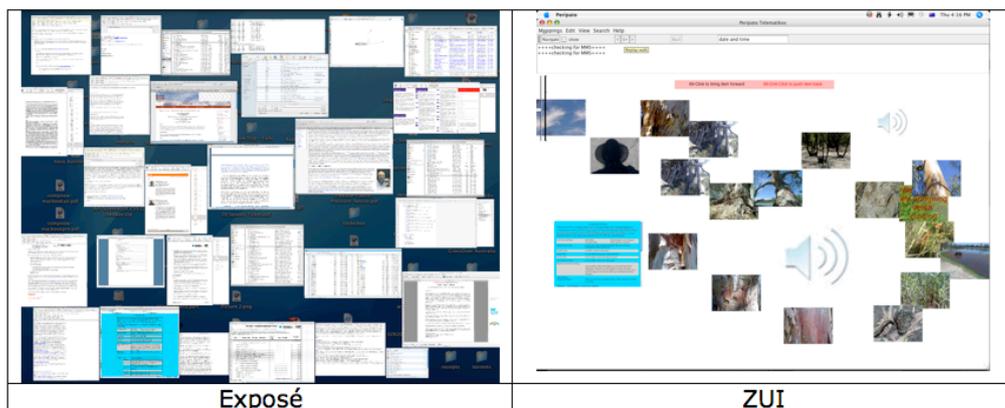
Imagine further that by applying extraordinarily good eyesight and eye-hand coordination, a user can both read and write as comfortably on any micron wide section of this surface as on any larger section. This would allow the full use of a surface which is several million pixels long and high, on which one can comfortably create, move, read and compare information at many different scales.

The above scenario would, if feasible, put vast quantities of information directly at the user's fingertips. For example, several million pages of text could be fit on the surface by reducing it sufficiently in scale, making any number of on-line information services, encyclopedias, etc., directly available. [...]

The above scenario is impossible because we can't read or write at microscopic scale. Yet the concept is very natural since it mimics the way we continually manage to find things by giving everything a physical place. A good approximation to the ideal depicted would be to provide ourselves with some sort of system of 'magic magnifying glasses' through which we can read, write, or create cross-references on an indefinitely enlargeable ('zoomable') surface. Pad++ gives users this zoomable surface (The Pad Metaphor, n.d.).

This type of interface is not common, so some examples of where it is being used may assist the reader in grasping its full implications. For a more comprehensive list of ZUI's please refer to Appendix 6 ZUI Research.

Zooming is predominantly making appearances in Apple products. For example, Apple's operating system, OS X, has an inbuilt feature, Exposé, that allows you to temporarily see all your windows at once. This is accomplished by reducing the size of all open windows, so that they all fit on the desktop. Later versions of the operating system allow the creation of multiple desktops, to which the user can assign any open window.



*Figure 4 - Exposé and ZUI*

My first experiments in 1998 with a ZUI interface, provided a glimpse of the possibilities. Hardware at that time struggled with the power required to make this type of interface workable. Several years later, whilst demonstrating work based on these early experiments I discovered that the interface was far more responsive. It seemed that consumer hardware had advanced to a point whereby the use of this interface became a real possibility.

ZUI has distinct advantages over conventional graphical user interfaces built upon the desktop metaphor/analogy. Once the initial obstacle of learning to work in a completely new way is overcome, ZUI provides much efficiency over desktop GUI's. This has been determined through empirical tests conducted with users, where the efficiency of an interface is determined by two criteria: view navigability and view traversal.

View navigability is concerned with how to decide where to go next or 'the process whereby people determine where they are, where everything else is, and how to get to particular objects or places' (Jul and Furnas 1997).

In order to facilitate the decision of where to go next, navigational 'residue' or 'scent' is important. 'The basic insight is that, in order to navigate through a world with minimal prior knowledge of its layout, each local view must present information (e.g., signs, labels, views of distant landmarks, etc.) that will help the navigator make their next navigational decision' (Jul and Furnas 1997). If we compare this to walking, navigating into a place that we have little prior knowledge of requires a reliance on signs and other information that will assist in making the decision of where to go next. One of the important features of ZUI is its ability to facilitate navigational residue or scent. Constituent items of the mappings can be individually zoomed in the interface space to the point where they are barely visible, but still visually comprehensible (Furnas 1997). Compare this to the visibility of a document buried somewhere within a computer's file system. This has no visible residue or scent and hence is much more difficult to locate.

View traversal, on the other hand, is the simpler underlying iterative process of viewing, selecting something seen, and moving to it, and ignores how to decide where to go next, which is central for view navigability. Returning to the previous analogy of walking, view traversal can be compared to seeing a landmark, and deciding how to get to it with minimum effort.

As view traversal is concerned with viewing, selecting and moving through a structure, the interface that facilitates this is critical. 'EVT (Effective View Traversal) analysis of zoomable interfaces (reveal that they have) dramatic advantages' (Furnas 1997). In ZUI, it is possible to see all mapping constituents. Although some items may be so small that they are barely visible, the fact that they are visible at all makes it possible to move to those items with minimum effort.

In summary, '[e]fficient view traversability is not enough: it does little good if a short traversal path to a destination exists but that path is unfindable. It must be possible somehow to read the structure to find good paths; the structure must be view navigable.'

ZUI provides an 'infinite plane of information having infinite resolution' (Raskin 2000, p. 153). This effectively means that, when zoomed out sufficiently, all content is available for viewing on an infinite plane.

Returning to the planning wall comparison, a major difference between the planning wall and ZUI is the ability in ZUI to bring constituent items forward/closer, or put another way, to enlarge a particular detail. Imagine a small item on the wall that needs to be observable from a greater distance, such as a subject heading. That item is removed from the wall, enlarged sufficiently (i.e. reprinted at a larger size) and replaced. Now that item can be viewed from a greater distance. To produce the same effect, ZUI allows for the sizing of individual items on the infinite plane so that that item is observable or not from the zoomed out position (i.e. the 'big picture').

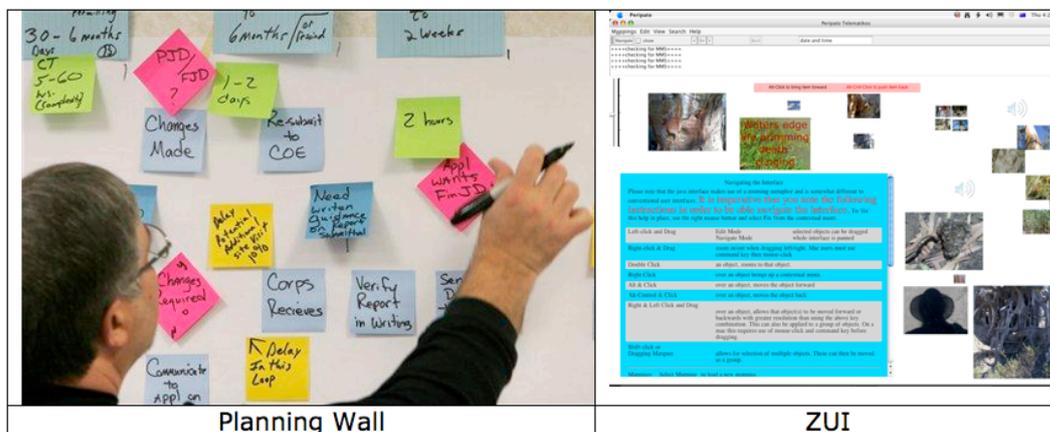


Figure 5 - Planning Wall and ZUI

When working with the wall, related items are usually clustered, and identified with a large heading (so that it can be read when looking at the 'big picture' — as we may not be able to read the detail in any of the clustered items). The spatial proximity of items and clusters of items to each other is indicative of a relationship. ZUI allows the clustering of items and the spatial positioning of items to indicate a relationship. Nothing is fixed in the infinite plane of ZUI, although there may be times when temporary fixing of an item is useful.

In both cases (i.e. the wall and ZUI) we are able to locate items as we remember the relative spatial location of items. This taps in to our inherent ability to remember landmarks and relative position. This is in stark contrast to the way conventional user interfaces present information and how we manage to remember (or not) the location of items in our file systems.

There are similar applications available that make use of some limited zooming capabilities (e.g. The Brain, Visual Thesaurus, Omnigraffle, FreeMIND, Google Maps, Google Earth to name a few) but they differ from ZUI in one significant way. All of these applications allow for the placement of content on an infinite plane as does ZUI, but the constituent items cannot be zoomed individually. Therefore, the content effectively appears on a single plane with no provision for relative sizing/zooming of content. If we compare this to the planning wall analogy, it is as if all that the viewer can do is step back to view the whole picture or step forward to view detail. There is no analogue to the enlarging of one item over another that is a major requirement for the efficiency of the ZUI. Everything appears on the same plane at the same scale, and we can only magnify this view.

*Peripato Telematikos* implements ZUI in order to take advantage of the facilities it offers. The constituent items that make up the mappings can be spatially positioned to indicate a relationship, and all items can always be viewed by simply zooming out. Items can be enlarged/reduced in relation to one another in order to facilitate the clustering and identification of groups. Items the user designates as of lesser importance can be made small, rendering them barely visible when zoomed out, but nevertheless, easily locatable and accessible as a residue or trace of their presence exists.

Other applications that have made use of the ZUI paradigm are detailed in Appendix 6 ZUI Research. I provide a summary of this research and how it informs this project.

ZUI's are still being investigated in numerous research laboratories and commercialised (e.g. Raskin for Mac and Prezi) in some instances. Many frameworks (including Piccolo upon which this project was built) exist allowing developers to create their own implementations. Other examples of frameworks are: Deep Zoom by Microsoft seemingly targeted at image zooming, OpenZoom SDK a toolkit for the Adobe Flash Platform, Zoomooz, a jQuery plugin for making web page elements zoom, Seadragon AJAX Library for embedding single high-res images into a web page and the ZOIL Software Framework.

Many of these have been developed for the specific purpose of zooming images alone, whilst applications such as Raskin for Mac (which integrates specifically with the Mac desktop to improve productivity) and Prezi (a presentation tool) have specific purposes. All frameworks apart from Piccolo make use of proprietary

software languages. This is problematic as proprietary products can become obsolete if the controlling company chooses to discontinue support. Therefore, to remain open and transparent the only choice is Piccolo, the framework upon which this project is built, which uses the open source programming language Java.

Critical evaluations of Zooming User Interfaces are limited, but from those that I have been able to locate, several issues emerged and have been raised in the usability tests.

Desert Fog [...] describes a state whereby the user of a ZUI has manipulated the interface such that they have no "landmarks" or cues upon which to work out where they are (Jul & Furnas, 1998).

This condition was addressed, as it was a problem identified in the usability tests. This condition occurs in one of two ways. Firstly, the user has zoomed in to a point where no information is displayed on the interface. This has been rectified by ensuring that the interface will not continue zooming if in fact there is no content in the camera's view. Secondly, the user has zoomed out to a point where every piece of information on the interface is too small to be visible. Again, this was identified as a problem in the usability tests and addressed by imposing a minimum size for the viewing of all content in the interface so that the content cannot be zoomed to a point where it is no longer visible.

Related to this is the problem of content being too small to be recognisable. This occurs more so for textual content where the item is large enough to be visible but too small for any of its content to be recognisable.

Research has shown that many people can make perfectly accurate relevance judgements about documents given only a small part of the information (Mochizuki & Okumura, 2000; Tombros & Sanderson, 1998; and Salmoni & Payne, 2002), it may not be necessary for the full information to be presented to the user (Advogato: The Zooming User Interface 2004).

This has been resolved by making use of the semantic zooming capabilities of the ZUI. As textual items are reduced in size through zooming, the text is replaced by a title that is clearly visible. If the item is enlarged through zooming the title is replaced by the actual content. This has been shown to be an effective strategy.

'The title alone allowed a level of discrimination equal to that of the full text'  
(Mochizuki & Okumura, 2000).

There are advantages provided by this approach. By displaying a small part of the information i.e. the title, less information is presented to the user resulting in less time to complete the search task. Furthermore, there is less visual clutter meaning that information from more documents may be presented through the interface at any one time and fewer resources are required by the system, as less information has to be shown.

In another study (Hornbæk, Bederson and Plaisant 2001) it was shown that task completion time was lower for the ZUI in comparison to an overview+detail interface. A recall task was also measured to test the participants' memory of the documents structure and content, and again the ZUI was found to allow a better recall. It was also found that for visual information, ZUI's have benefits in reducing task completion time while not increasing the errors committed. An interesting recommendation that I had not considered is the notion of bookmarks. If a user wished to 'remember' a specific location within the ZUI document structure, it was suggested that flags could be used as this would be a readily understood metaphor by most users. This is something that will be considered in future revisions of the project.

Once a required location is reached, it could be marked by the user with a flag, perhaps colour-coded to denote the user who placed it (or if there are many users, a name, a picture, or a descriptive label). If another user required this location, they could simply examine a list of available flags using search criteria to narrow a long list down to something manageable. Selecting one would bring the user to the flags location (Advogato: The Zooming User Interface 2004).

Another study (Harrower & Sheesley 2005) indicated that it is difficult to apply a one-size-fits-all solution to panning and zooming, as it depends upon both the user's prior experiences and the task they are trying to execute. Therefore, a good ZUI system should incorporate multiple methods for panning and zooming. This has also been an issue with this project that was identified in the usability tests and various methods have been attempted. The final solution provides three modes of zooming: mouse right click and drag, mouse wheel and trackpad. Mouse wheel is effective for shorter distances, whereas the mouse and trackpad methods allow rapid zooming.

A major issue that emerged from the usability tests was the difficulty users had in adapting to a new way of working. ZUI's are not a familiar way of working for most computer users. People acquire interface skills largely through exposure and repetition. As a result, interface paradigms that are most common will often seem natural and 'intuitive' to users. The ways of working we have become accustomed to through repetition and exposure, are often not the most efficient ways of working. The classic example is that of the QWERTY keyboard layout. This feels natural and is the preferred way of working only because it is so ingrained, not because it is the most efficient way of working. In fact, it is purposely inefficient as it was designed to slow-down typists since early typewriters jammed easily. Therefore, this interface (the QWERTY keyboard) resulted from the limitations of the technology at the time of its inception, and not because of any inherent efficiency or the needs of the user. 'Have machine-centric solutions been foisted upon map users, and thereby constrain how we work and think' (Harrower, M. & Sheesley, B. 2005)?

In order to address the unfamiliarity of ZUI interfaces, I have adopted many 'familiar' interaction devices to ease the user's transition to the ZUI. For example, users preferred using the mouse wheel and trackpad, rather than the right-mouse click and drag option, as these are familiar to most computer users and are used in other now common zooming-like interfaces. Other familiar devices used include: double-clicking an item to zoom into that item, clicking on an object to select it and using the shift key to make multiple selections, clicking on white space to deselect everything and hovering over an item allows contextual information for that item to be viewed.

## Critical Evaluation of the Interface.

I have applied a commonly used methodology, Shneiderman's 'Eight Golden Rules of Interface Design' (Shneiderman 2005, p. 74) in order to critically evaluate the interface's fitness for purpose.

### 1. Strive for consistency.

Consistent sequences of actions should be required in similar situations; identical terminology should be used in prompts, menus, and help screens; and consistent commands should be employed throughout.

Consistent actions are required in order to engage with all content. All items are manipulated in the same manner, regardless of the content type: hovering provides metadata and highlights item for clear identification, clicking selects and highlights the item, shift key allows for multiple selections and double-clicking zooms to the said item.

*Tools, Help* and *Mappings* items utilise the same look and feel as all other content but operate on a separate plane for increased usability.

### 2. Enable frequent users to use shortcuts.

As the frequency of use increases, so do the user's desires to reduce the number of interactions and to increase the pace of interaction. Abbreviations, function keys, hidden commands, and macro facilities are very helpful to an expert user.

Keyboard shortcuts have been provided utilising function keys and familiar key sequences (e.g. ctrl-a to select all). Functions that have been found (i.e. through usability tests) to be frequently required have been allocated a prominent place on the menu bar; these are the *Show All* and *Back* buttons. *Tools, Help* and *Mappings* items are readily accessible and always available, but can be hidden when user no longer requires their viewing.

### 3. Offer informative feedback.

For every operator action, there should be some system feedback. For frequent and minor actions, the response can be modest, while for infrequent and major actions the response should be more substantial.

This and all other ZUI interfaces I have examined have no feedback for the primary zoom mechanisms. There is a very good reason for this, as ZUI's have an infinite depth and breadth. Therefore, it is not possible to say where in the ZUI space a user is situated as there are no finite limits to relate to. ZUIs such as Google Maps do not have infinite depth. There is a point beyond which you can no longer zoom in any closer. Therefore in these instances, it is possible to provide feedback. In the case of Peripato Telematikos and many other ZUIs, zooming feedback is provided by the content itself.

Informative feedback is provided whilst content is loading by way of dialogs showing percentage of content loaded.

All desktop buttons have roll over feedback.

Audio and video files will only play if Quicktime For Java (QTJ) is loaded. The software tests for the availability of this utility. If it is not found it will alert the user to that fact. This functioned correctly in all usability tests except for one instance: an Intel-based Mac Pro running OS X 10.6.2. I have been able to ascertain that this is due to the fact that QTJ is now deprecated and not available at all on newer versions of Java. This includes OS X 10.6 onwards and all Windows systems running in 64-bit mode. A search revealed no such announcement, apart from mentions from developers on apple developer blogs. As a result, this will require a major reworking of the audio and video playback capabilities.

Search facility alerts user if no matches found, otherwise items that match are highlighted and the camera zooms to include only those items that match.

#### 4. Design dialog to yield closure.

Sequences of actions should be organized into groups with a beginning, middle, and end. The informative feedback at the completion of a group of actions gives the operators the satisfaction of accomplishment, a sense of relief, the signal to drop contingency plans and options from their minds, and an indication that the way is clear to prepare for the next group of actions.

Wherever possible, all dialogs are designed to yield closure. For example, the search facility requires that the user select *search by text* or *search by date* from the tools menu. A dialog box appears that allows the user to enter the search terms. The user is then presented with one of two scenarios:

- Nothing is found so an alert box appears stating that no match was found, or

- There is one or more matches. All matching items are highlighted and the interface zooms to include only those items that match.

5. Offer simple error handling. As much as possible, design the system so the user cannot make a serious error. If an error is made, the system should be able to detect the error and offer simple, comprehensible mechanisms for handling the error.

The zooming mechanism has been limited to ensure that content is always visible and not so small that it is lost. This limit is dependant on the total content so that whatever mapping is being viewed, when the user zooms out there will be a point beyond which it will not be possible to zoom any further. This has been the greatest source of error.

Software checks for the libraries (Quicktime for Java) required for playing audio and video content. If these are not present, the user is alerted to this. As mentioned previously, QTJ is no longer supported as of OS X 10.6 and Windows systems running in 64-bit mode and so this functionality is broken.

In order to ensure stability, the software has been tested for memory leaks and these have been eliminated.

6. Permit easy reversal of actions.

This feature relieves anxiety, since the user knows that errors can be undone; it thus encourages exploration of unfamiliar options. The units of reversibility may be a single action, a data entry, or a complete group of actions.

Show All button allows the user to return to a global view of content and can be used as a recovery mechanism, and Back button returns user to previous view.

7. Support internal locus of control.

Experienced operators strongly desire the sense that they are in charge of the system and that the system responds to their actions. Design the system to make users the initiators of actions rather than the responders. Surprising system actions, tedious sequences of data entries, incapacity or difficulty in obtaining necessary information, and the inability to produce the action they want all build anxiety and dissatisfaction.

Interface designed to support internal locus of control by ensuring no actions take place unless initiated by the user. For example, in mapping mode, it is not possible to receive new entries unless the user activates this mode. Three

methods are provided to enable zooming. User can zoom by: right-mouse click and drag, mouse-wheel and trackpad. Two of these modes are familiar to computer users as they have become widespread, i.e. mouse-wheel and trackpad. Wherever possible, sequences required to complete an action kept to a minimum. Search facility has been provided to support the finding of necessary information. Software checks for installation of necessary libraries that enable playback of audio and video content. User is alerted to this fact when the necessary libraries are not installed.

#### 8. Reduce short-term memory load.

The limitation of human information processing in short-term memory requires that displays be kept simple, multiple page displays be consolidated, window-motion frequency be reduced, and sufficient training time be allotted for codes, mnemonics and sequences of actions.

Semantic zooming facilitates keeping display simple. Text items display full text when sufficiently large. If, through zooming, the size is reduced so that text is no longer legible, the text is replaced by a large, readable heading, reducing clutter and facilitating to keep display simple.

Toolbar buttons kept at a minimum to facilitate frequently used functions.

Animation/motion of content slowed so that user has a sense of relative spatial arrangement.

Help and Tools items are displayed upon start-up to alert user to their existence and are always readily accessible.

## **Usability Testing**

The issues raised in the usability tests are included in Appendix 8 Usability Tests.

The biggest issue facing users with this interface was one of unfamiliarity. Despite many being familiar with limited zooming interfaces such as Google Maps, it was still a problematic interface to navigate. Several iterations of usability tests later, the interface is now far more useable. The major issue was controlling the zooming of the interface. This relied on users using right-mouse button and dragging, an action not familiar to most users. This was even more troublesome with Apple computers that used a single mouse button as this required users to click, hold down the command key (to simulate right mouse click) and then drag. Fortunately, the prevalence of mouse wheels and track pads has simplified this interaction for the majority of the users tested.

The next major problem was the confusion created by allowing visitors to the site some editing capabilities. This has been rectified by clearly delineating between viewing and editing. This has alleviated the concerns of the users somewhat. The usability of the authoring mode will be something addressed in future version of this project, as it is beyond the scope of this project to provide a fully functioning and usable authoring environment. Despite this, participants were able to operate the authoring environment with little guidance from me as can be evidenced from the comments made in the Townsville review.

Other issues related to providing quick access to commonly used functions. Removing as much clutter as possible from the interface, limiting the zooming to that which is necessary hence alleviating the disorientation experience by some users when content was not visible. Further issues are itemised in Appendix 8 Usability Tests.

## Interface Research

Inspired in part by the memex desk-based information machine suggested by Vannevar Bush in 1945, Douglas Engelbart led the Augmentation of Human Intellect project at Stanford Research Institute (SRI) in the 1960's, that developed the On-Line System, which incorporated a mouse-driven cursor and multiple windows used to work on hypertext<sup>28</sup>. Engelbart's work directly led to the advances at Xerox PARC, credited with developing the first computer, the Alto, to demonstrate the desktop metaphor and graphical user interface (GUI). Alan Kay led the research group at PARC Xerox that was responsible for the development of the Alto. Steve Jobs, Jeff Raskin and some other Apple pioneers visited PARC in 1979, and concluded that Kay's ideas were the way of the future. The GUI and mouse made the use of computers far more intuitive and led to their rapid uptake by the public. The GUI itself became an area of considerable research and a major branch of computer science, and led to the field of User Experience Design, a term coined by Donald Norman.

Ben Shneiderman is an American computer scientist, and professor was the Founding Director (1983-2000) of the Human Computer Interaction Lab at the University of Maryland, where the ZUI platform (Piccolo Home Page n.d.) upon which I have built my interface, was developed.

Ben Shneiderman has been attributed with the following mantra in relation to viewing large amounts of information.

Overview first, zoom and filter, then details-on-demand (Shneiderman, 1996).

This project conforms to these requirements as it allows the audience to see an overview of the entire mapping and provides the ability to zoom into areas of interest. Shneiderman conducted fundamental research in the field of human-computer interaction, developing new ideas such as the direct manipulation interface in 1982, and his eight rules of design. While Shneiderman's eight rules of design are a staple of usability testing, it is Jakob Nielsen, who is considered the foremost expert in Web usability.

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<sup>28</sup> Hypertext is text displayed on a computer or other electronic device with links to other text that the reader can immediately access. This is now a very familiar way of working that all that use the WWW engage with.

Ted Nelson, an American sociologist, philosopher, and pioneer of information technology, coined the terms "hypertext" and "hypermedia" in 1963 and published them in 1965. Nelson founded Project Xanadu in 1960 with the goal of creating a computer network with a simple user interface, and devoted much of his adult life to working on Xanadu and advocating it. I looked at and evaluated a number of implementations of the Xanadu project in order to inform the development of this project. I met Andrew Pam, and discussed this work back in 1998. He introduced me to the first ZUI implementation I had worked with, namely Pad++. It is interesting to note that the developers of this early ZUI framework were some of the key players in HCI, namely: Ken Perlin, Ben Bederson and Jim Hollan. Pad++ was eventually ported to Java and renamed Piccolo. This is the framework upon which the interface for this project is built.

For all the details please refer to Appendix 7 Interface Research

## Conclusion

*Peripato Telematikos* continues the notion of walking as an art form leading from and influenced by Baudelaire's flâneur (one who strolls) the Dadaists, and Surrealists through to the experiments of Fluxus and the Situationists (Lucas 2004). The discussion contained in this thesis reflects on this 'experimental activity' (Bonnet 1992, p. 77), and how it has influenced my processes and methods for examining urban space.

The project's main creative elements are as the title indicates: walking as an art practice, cartography and the mapping of these walks, and software art. The walking-as-art group component of the project explores and contributes to the understanding of collective expression and how the input from a group can create a collaborative art work that exceeds the imaginings possible by an individual. It calls for a heightened aesthetic sensibility from the participants in their relationships with the everyday and allows for the documentation of the walks using a wide range of mediums including: images, text, video and sound. In a large number of cases the act of walking, guided by an unknown map, brought a different way of perceiving their local environment.

A common practice of many contemporary walking artists is the documentation and presentation of this information to the public either during or after the event, and a major proposal of *Peripato Telematikos* was to find ways of capturing and communicating this information in the present moment. This was achieved through a combination of software and cartographic components that created a means by which audiences were able to engage with the walkers during the event(s) in real-time or synchronously. This extends the level of audience engagement above and beyond that which other works in this field have allowed. In particular it continues and extends the solo work performed by Mark Minchinton *Void: Kellerberrin Walking* (2003), and *Strategies for leaving and arriving home* (2011) by Rodigari, where performers/walkers update a blog at regular intervals either daily or less frequently, providing an asynchronous engagement for the audience/viewer with the performance/walk. In some walking performances the performers invite the audience to accompany them. This allows for the most intense audience engagement but limits the audience to those that can actually attend, which is not always practical.

Another important focus of the project was the creation of mappings and an

investigation into how contemporary artists engage with cartographical images and practices. One prominent aspect involved mapping the small, specific, personal or neglected aspects of the environment. While another trajectory of contemporary mapping within art that relates to this project is that of the category of experimental geography. Of particular relevance to this project is the intense activity in 'locative'<sup>29</sup> works and experimentation with mobile-networked media and the ubiquity of mobile communication devices and their extensive reach into many sections of society. Claims that locative arts have the ability to raise peoples' awareness of and intimacy with their local environs are ambivalent. Closer analysis of the theory and practice revealed that despite this potential, in some cases the technology worked against these aims. Many theorists and commentators reported considerable optimism for the mobile phone's potential to (re)connect us to our local environs, whilst others observed the opposite occurring. The findings from the collective mappings of *Peripato Telematikos* indicated that the majority of participants experienced a stronger connection to their environment through the walks. It was the participants themselves that were the main creators of new social knowledge through their walking, observations and perceptions, and the collaborative documentation they generated.

The differences outlined in Deleuze's notion of tracings and mappings, whereby a tracing implies that we are following predefined routes, traversing paths of extant knowledge, whereas a mapping is created through experience, experimentation and performance, creating paths and connections where they previously did not exist influenced the autobiographical walking works. The relationship between autobiography, walking and the maps it produced became an important aspect of the project provoking me to consider 'autobiography as cartography of self' (Heddon 2008, p. 88). This mapping of the self through the process of walking was a process that began many years ago as I began to unravel and explore the issues affecting my hyphenated status as a Greek-Australian. The idea of investigating pilgrimage and the walking associated with it, stems from the notion of returning to an ancestral home for the purpose of spiritual and cultural awakening. It is through these 'returns' that I have come to better appreciate the connection that people have to their land or country, something that resonates

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<sup>29</sup> locative – location-aware, networked media - the term is commonly used to refer to many of these location aware works that have location-specificity embedded (usually facilitated by GPS).

with many contemporary issues, such as the meaning of country to the Australian indigenous peoples, and the yearning for 'home' that many immigrants never relinquish. The walking lent itself to a type of mapping of narrative on the land itself, resulting in a form of auto-cartography.

This line of thought led to research into current cartographic theories on mapping revealing a dilemma in this discipline and a call from the cartographic community for experimentation in the visual forms of maps. Many recent art works in this field are termed 'locative arts' and use existing 'static' maps, annotated with subjective material, often including GPS information so that there is a direct association between the content and its location.

The decision not to utilise GPS information in the mappings, was for reasons of *relevance, mutability of the mappings, and access*. GPS information holds little relevance in this project, as the aim was not to append subjective information to a base map, but to actually sever the mappings from the base map. As we live in a rapidly changing, dynamic world this project's mappings have been designed so that they can change over time, opening up the possibility to represent the fluid, temporal complexities of the contemporary world. The system was made so that it was not reliant on GPS information, as at the time of its inception, there were few phones on the market with GPS capabilities. It was a conscious decision taken in order to facilitate participants to engage with the project without reliance on sophisticated mobile hardware.

Conceptually, embedding GPS metadata in content assumes that all content will be location based. This is not the case with this project as the content is a combination of images, texts, sounds, and so on, therefore, no assumption is made about the type of content in the mappings. This open approach is intentional as it allows for other forms of representation above and beyond that collected from a physical location and has allowed richer mappings to be produced.

The controlling view from above has been facilitated by the striation of the earth's surface using a grid of lines which is encapsulated in the contemporary world by the GPS system, referred to by some theorists as the 'Imperial grid' (Holmes 2004). In *Parables for the Virtual (2002)*, Massumi argues that if one reduces the systems of meaning to positions on a grid, one denies the very variation and transition inherent to those systems of meaning. This project enables the creation of new knowledge through the walking and the mappings produced. Any stifling of

knowledge would work against these aims. There is currently considerable criticism of the use of a military infrastructure (i.e. the GPS system) in media art works. Some theorists (Broekman, Hemment, Fusco, Lovink) comment that making use of this infrastructure without any critique is akin to complicity with the 'society of control'. The uncritical adoption of this system has been seen as a return to Cartesianism or the 'Cartesian tradition, with its illusion of homogenous three-dimensional space seen with a God's-eye-view from afar' (Jay 1988, pp. 16-17).

This philosophical framework has been heavily criticised for many reasons, including 'its privileging of an ahistorical, disinterested, disembodied subject entirely outside of the world it claims to know only from afar' (Jay 1988, p. 10). The production of the *Peripato Telematikos* mappings involves embodied subjects, immersed in the world that they come to know intimately. For Holmes, engagement with these technologies requires a reflexive approach so as not to inadvertently valorise this new imperialism. These criticisms seem at odds with the optimism surrounding many mapping/locative works indicating a wide variety of opinions on how or even if the technology might create a new artistic vision of the world.

This project's mappings are totally produced and constructed from the experiences involved in the staged walks, and make no attempt to factually order space. There is an intended subversion of the map, by creating a (re)presentation from the view point of ground level through a montage of media fragments. This builds on de Certeau's proposal that place is defined by urban planning but transformed into a space through the act of walking. The walker makes no pretence to mapping a totality, objectivity, or ordering space. Her intervention is one that is very localised set amongst the 'murky intertwining of daily behaviours.' This raises the possibility for mappings to articulate knowledge that isn't solely about ordering space, but covers a multiplicity of concerns.

The mappings produced through the documentation of the walks are viewed through a ZUI interface, written specifically for this project. This interface paradigm was chosen, as it draws on humans' inherent ability to organise spatially and empirical studies (Jul and Furnas 1997) have shown that it has advantages over the more common desktop GUI interface. This unfamiliar interface and way of working presented problems for users mostly because of its unfamiliarity. Through the feedback obtained from the usability tests, this

interaction has been improved and the interface is now more intuitive despite its unfamiliarity.

The development of *Peripato Telematikos* continues the practice of software writing as an art form which had its beginnings as far back as 1970 when art historian Jack Burnham curated the exhibition, *Software. Information Technology: Its New Meaning for Art* (Shanken 1998). Software art may be considered as artistic experiments that display software in a different way, as is the case with *Peripato Telematikos*, and through these experiments can aid in the development of new types of software and interfaces. The interface was designed with the intention to break away from the normalised conventions of hierarchic (exemplified by the desktop GUI) and rhizomatic connections (as the Internet is organised), imposing no ordering paradigm on the content. The content is 'connected' by spatial proximity.

Software art as a field also draws attention to how software works socially and politically and has a didactic perspective trying to preserve a democratic, transparent and open society. Given software's ubiquity, it is surprising that it has received so little critical analysis from cultural commentators except for the few theorists leading the way, such as Manovich and Fuller. The Free and Open Source Software (FOSS) movement, in which the software source code is freely available, and generally written collaboratively, has made some in-roads towards improving software transparency. With this project, I intentionally make use of open source, non-proprietary systems wherever possible and release all the code I have written. The software is written in the open source Java programming language. Many other ZUI frameworks were looked at but none made use of an open-source, non-proprietary programming language such as Java. In relation to the political implications of software, this project as a whole empowers people by providing the opportunity to develop their own knowledge and understanding of place through the creation of subjective cartographies.

The project builds on existing software art works such as *Turbulence* (McCormack 1995), by Australian software artist Jon McCormack, which explores artificial life and Australian artist Mez who are using the code as an expression in itself. *World of Awe* (1995) by the artist Yael Kanarek also influenced the project as I attempted to subvert user interface conventions in a similar manner by relating interface elements to aspects of the work rather than the usual functionality accessed through these menus. However useability tests have since confirmed

that this only added more confusion to an interface that is unfamiliar to most computer users and was a distraction from the main focus of the interface. It has therefore been removed to give wider and clearer access to the project.

My previous experience as a software design engineer and the introduction to Object Oriented<sup>30</sup> methodologies for the development of software made me aware of the simplicity of conceptualising the 'world' as a collection of objects that would share some common characteristics, while differing in their detail. The exposure to this environment has influenced the development of my software poetics and my ability to envisage the production of collective perceptions of place.

'Traversing pathways through an environment, we are able to create worlds of knowledge (or pathways of knowledge through the world) by talking meanings and understandings into existence' (Anderson 2004).

The three major aspects of this project: walking as art, cartography and software share a relationship through their mutual and inter-related ability to produce knowledge that can be shared and collaboratively constructed as an art work. The walking creates or reveals knowledge and understandings of place, which is represented as mutable mappings through the facilities enabled by the software written specifically for the project.

My aim in *Peripato Telematikos* was to make art about walking, and it has become clear that this walking produces knowledge of place and self, as long as we allow ourselves to be open to the world, break from habitual practices and immerse our selves in the walks. In the case of the collective walks, my role shifted from that of 'the artist as producer, to the artist as collaborator in the construction of social knowledge ... [becoming] more intimately involved in the production and mediation of new social knowledge' (Papastergiadis 2008). Throughout this research project I have been inspired by the interest and commitment of the participants and their inventive connection to place and adaptability to their environments. In the case of the individual walks, what became paramount was the ability of these walks to evoke autobiography and the resultant mappings can be considered an 'autocartography'. I was conscious of not simply telling stories of myself, but to use the details of my own life to illuminate or explore something more universal. In doing so, I discovered many

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<sup>30</sup> Object-oriented design is the process of planning a system of interacting objects for the purpose of solving a software problem. It is one approach to software design.

networks of submerged urban waterways in Melbourne and other cities around the world, traversed a path that the ancestors of my mother's village would have crossed hundreds of years ago when they first populated this village, became lost in the hinterlands of my father's village, and walked for them both whilst unbeknownst to me they were both very ill.

The inclusion of the project in major events such as *Portable Worlds II* a touring exhibition of mobile phone works organised by the Australian Network for Art and Technology (ANAT), and the Adelaide Fringe Festival (2008) has given me a wealth of understanding about how people interact with the conceptual and practical elements of the project. It has also increased my knowledge around the organisation and implementation of the project – what works and what doesn't. I plan to continue the development and refinement of the work and hope to improve its ability to provide fresh insights into how we see and interact with our world.

Development of the *Peripato Telematikos* application will, I suspect, continue for many years to come as through its development, it has become apparent that it may have great potential in a number of ways only hinted at thus far. The authoring aspect of the application requires further work so that it has better usability. It may even, like the open-ended mappings themselves, never end as new aspects and directions continue to emerge.

The short-term priority will be to further develop and test the authoring aspect of the application. The audio and video playback functionality will need resolving after the announcement that QuickTime for Java (the framework upon which this application relies for audio and video playback) is being discontinued, as I am interested in further exploring the potential of sound as a mapping element.

In the longer term several aspects of the work will be refined. In order to simplify the process of authoring content I have made use of HTML<sup>31</sup>. The current implementation of Java provides HTML 3.2, a very old standard, for the rendering of html documents. There are many third party renderers that I will investigate to incorporate into the application. This will enable richer content authoring and will facilitate the rendering of external web pages within the application providing better extensibility.

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<sup>31</sup> HyperTextMarkupLanguage

Since the inception of this project, other social spaces have emerged which will need to be considered and integrated. For example, Twitter could be used to provide content. In addition to this, I have investigated alternate means of delivering content to the application. Out of necessity (I was not able to send using MMS from Brazil), I created a simple web page through which content could be delivered to the application. Other possibilities that I have partly explored include submitting content to the mappings through iOS and Android apps.

I will conduct further collective mappings utilising the lessons learnt from the workshops, and will continue to explore urban waterways that I have identified here in Melbourne and as the opportunities arise, internationally.

I have successfully used the application for presentations at two international conferences as it provides a very effective means by which to display and manipulate information in the way that allows an audience to glimpse both detail and the bigger picture at the same time. I believe that I have only scratched the surface of what this application may be used for.

The project has opened up a number of possible avenues for future work, has changed my art and its conversations will always be with me.

## Appendix 1 Logging On

*Peripato Telematikos* is best accessed through a computer connected to the Internet via broadband. Although it should work with all browsers, some users have reported difficulty with Safari and Internet Explorer. It operates best under Firefox. Your browser would be configured to allow the downloading of active content and have Java Web Start installed. (If you do not have Firefox installed, it is a simple process to do so: simply google 'Firefox' and download Firefox from the [www.mozilla.com](http://www.mozilla.com) website. See below, Step 5, if you have problems with Java Web Start.)

### Steps:

1. Ensure that Pop-ups are not blocked.
2. Access the online material through your web browser by typing the address <http://www.peripato.net>. A page will appear asking that you agree to the terms of the disclaimer by ticking the checkbox and click on the link 'Mappings'. The subsequent page displays a table populated with images, one for each mapping. Each image is a random selection from that mapping and will change with each log-in. Clicking on one of these images will commence the procedure for launching the software required to view the mapping.
3. After clicking one of the images, the file 'peripato2.jnlp' will be downloaded to the location designated for downloads on the client (your) computer. This file (i.e. peripato2.jnlp) will initiate the downloading of the Java application, *Peripato Telematikos*, as long as the browser is configured correctly, and Java Web Start is installed. Once the application has downloaded, it will open and commence downloading the constituent components of the mapping. If the file does not download, check that your web browser will allow pop-ups.
4. If the browser is not configured correctly, the file that is downloaded (i.e. peripato2.jnlp) will not initiate the process described above. One simple solution is to locate this file on your computer and double-click it.

5. If the file (i.e. peripato2.jnlp) is not downloaded this is most likely due to browser security settings and your easiest alternative is to try another browser, as resetting the security settings is not an option in many systems, for example, public access computers in a library.
  
6. Other problems that can be encountered include not having Java installed on the client computer or not having the latest version of Java installed. The page with the table that appears after clicking 'Mappings' has some simple diagnostics that allow the visitor to check their Java installation. Click on the text *Verify your java installation*. This will confirm that Java is installed and the version. The version must be 1.5 or greater. If Java is not installed, then a link is provided to assist with the installation.

## Appendix 2 Navigating The Interface

This research project implements an experimental user interface based on a 'zooming' metaphor the implications of which have been discussed. This interface has been shown to have many advantages over conventional interfaces based on the desktop metaphor, but has an initially steep learning curve in order to be productive. The instructions below are available through the user interface.

### NAVIGATING THE INTERFACE

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Please note that the interface makes use of a zooming metaphor and is somewhat different to conventional user interfaces, and therefore requires some patience.

**It is imperative that you note the following instructions in order to be able to navigate the interface.**

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#### MOUSE ACTIONS

Mouse Over	Highlights element facilitating identification. Audio/video elements will display a play button, clicking this initiates play of audio/video content as long as QT for Java is installed.
Left-click and Drag	pan to limits of content
Right-click & Drag Left	zoom in. Mac users must use command key then mouse-click OR Mouse Wheel OR TrackPad
Right-click & Drag Right	zoom out. Mac users must use command key then mouse-click OR Mouse Wheel OR TrackPad
Double Click	zooms to that object(s).
Click on hypertext link	Some mapping elements have hypertext links embedded in the text. Clicking on these links will navigate the view to the selected page.

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#### TOOLBAR BUTTONS

Show All	View all content
Mappings	Load a new mapping
Back	Return to previous view

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### **Appendix 3 Townsville Workshop Review**

This issue of QCN Bulletin features the story Pia Armitage and Claudia Silva wrote about Mapping Public Spaces.

#### **PARTICIPATORY TECHNOLOGY SERIES:**

##### **Mapping Public Spaces Project**

Pia Armitage and Claudia Silva, participants in Greg Giannis Mapping Public Spaces Project hosted in Townsville by Umbrella Studio, share their recent art and participatory technology experience.

**Participants Background:** Our names are Pia Armitage and Claudia Silva and we are living in Townsville at the moment. Pia is Australian and 37 years old and Claudia is 42 years old and from Brazil; she is here on a working holiday. Pia is a teacher of English as a Second Language at the Barrier TAFE and Marisol and Claudia are students learning English; they were also involved in the Mapping Public Spaces project.

Pia is an ESL teacher but her undergraduate studies were in Fine Arts and she specialises in photography, painting, multimedia and digital art. Pia has been a practising artist for about 10 years with a focus on community arts projects and bringing different parts of the community together, especially the migrant community, with whom she works. Aside from a Fine Arts degree Pia has an education degree and recently has completed her Master in Linguistics.

Both Claudia and Marisol are not practicing artists but they have been involved in community arts projects in Townsville. Claudia is a psychiatrist and works with mental health care and Marisol is a permanent resident, soon to become an Australian citizen, living in Townsville.

Participants included high school students, local artists, people from the city council, and people from the migrant community.

The Project: None of us had ever worked with mobile phone technology to create art before. Pia is a member of Umbrella Studios (where Greg Giannis, the creator of the Mapping Public Spaces project, exhibited) and was aware of the type of art Greg created. She was interested in the project given her background in community art and digital art. Pia encouraged Claudia and Marisol to join the project and extend their community contacts.

The project was primarily about people working together and the process of making the art rather than the finished result. It was loosely based on the theme of Urban Tapestries, a project conducted in London some years before. The project allowed participants to explore the Townsville neighbourhood through walking a planned route with a mobile phone that was used to take photos of anything of interest to them. These photos were then sent real time to a website where they were stored and later manipulated by the artist. All the images from different project localities appear on the same site.

Pia and Claudia had the opportunity to resize the images and animate them so that the finished result was a montage of images that moved in and out according to the editing plan. Text was also added to identify the site as being Townsville. These images were then projected onto a large white wall in Umbrella Studios. The website still exists at [www.peripato.net](http://www.peripato.net) <<http://www.peripato.net>> Peripato refers to the Greek word to walk while giving a class. The website remains an active space where editing can continue to happen. On this website it is also possible to see other cities where the same process has occurred.

Process: Participants gathered and Greg explained the project and the fundamentals of the tapestry. There was a large aerial map of Townsville and people took a small post it note and wrote on it and attached it to a place of significance for them. Some people attached it to their houses, others to public spaces like parks or beaches and still others to pubs or galleries.

Then participants were given a map and asked to draw a route on the map that would take approximately an hour to walk. The route was about 2 kilometres. Greg then collected the maps and gave them out randomly.

In pairs the participants went out with their map and mobile phone ready to take photos. Claudia took photos of a jukebox in a pub, her own shadow and footprints

on the window of Umbrella Studios, while Pia took photos of shop windows, graffiti on walls and streetscapes.

Once the photo had been taken it was sent immediately by SMS to the website. Subjects for photos ranged from things and personal effects to street images, monuments and small details found en route. After a period of an hour all participants returned to Umbrella Studios and viewed their images that were projected onto the wall. Claudia and Pia volunteered to spend extra time arranging the images, resizing them and animating them.

Challenges and outcomes: The first challenge was learning how to manipulate the mobile camera and to SMS the photos. Secondly, the biggest challenge was the animation that involved some technical knowledge of how to use the computer program.

The greatest thing about the whole project was interacting with each other and realising how closely our paths crossed in the community. For the migrant participants they were astonished as to how easily they could walk freely in the streets, taking photos without fear of their personal safety.

This project really highlighted our sense of community and belonging to this place; we were literally in the picture. The process was great for building a sense of belonging.

One of the best outcomes was to work with an artist like Greg who really facilitated this project in a very modest manner. He let the participants run the project and this was empowering for them. There were no prerequisites for participating and the technology was made accessible for everyone. There was the realisation that technology could be used to bring people together, instead of intimidating them.

The project has inspired us. Pia is always looking at ways to engage the new arrivals in the community and since Mapping Public Spaces, all of the migrant participants have also been involved in another community art project. The students in Pias class were involved in making a Wikispace where they share photos, discussions and commentaries on their experiences. It has helped everyone realise how accessible technology is.



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## **Appendix 4 VITTA Letter**

13/12/06

To whom it may concern,

This letter is to confirm the Victorian Information Technology Teacher's (VITTA) understand the nature of the mobile technologies research project which is to be undertaken by Greg Giannis with our nominated primary and secondary school during 2007.

Metropolitan and regional primary and secondary schools have been invited to participate in the research to demonstrate the use of mobile technologies for learning.

VITTA is keen to explore the possibilities of such a project and perceives the many benefits some of which are outlined below:

- a) opportunities to develop good constructivist learning models in and out of the classroom.
- b) a model to assist the development of the affective realm enhancing teaching and learning
- c) a forum to increase the rapport between teachers and students in collaborative projects where all participants are learners
- d) strategy to develop engaging and authentic learning tasks which merge life issues and classroom activities
- e) opportunity to provide an easy to access technology for participants to be active learners
- f) provision of a program which bring whole school communities together including administration, teachers, students, parents and coopted community members
- g) an avenue for both teachers and students to upskill in ICT
- h) development of new ways of learning and addressing a variety of learning styles
- i) assistance in indicating the relevance of ICT in daily lives

- j) provision of new ways in which instant feedback can assist the learning process

The invited schools are very excited about their respective projects and look forward to being involved in activities which broaden the modes of traditional classroom tools for learning. Moreover by interacting closely with the wider school community in most of these projects all parties benefit: assisting communications; understanding and appreciation of local and global issues.

The schools have undertaken a commitment to utilise mobile technologies in line with the Education Department's User Acceptable Policies, individual school policies established usually at the beginning of each year for students P – 12.

Additionally schools will ensure that parents and students understand that in order to participate in such activities the school has undertaken the utmost care and due diligence. This can be in the form of the school's code of conduct and values statements. This also includes the safe use of technologies which acknowledges privacy and ethical concerns.

VITTA is most grateful to Greg for his innovative concepts and an opportunity to assist in this research project. Education must reflect societal values and aspirations. Projects like this demonstrate valuable ways in which cutting edge technologies can benefit education and evolving pedagogies utilising ICT in primary and secondary school settings.

Renee Hoareau

VITTA Executive Officer

## Appendix 5 The History Of Agiassos

In Constantinople, Agathon the Ephesian, priest of the Chapel of the Palaces, who was an iconophile, falls into the disfavour of Emperor Leo I and is self-exiled to Jerusalem. In the early 802 b.C. Agathon hears that Empress Irene the Athenian, who is also an iconophile, lives in exile on Lesbos island. Wishing to meet her and be nearer to Constantinople, he sets off for Lesbos, taking with him an icon of 'Panayia I Vrefokratousa' (Madonna and Holy Infant), a Silver Cross with wood from the True cross, a manuscript Gospel, and other relics.

He arrives on the island. Meanwhile, Irene the Athenian has died. Agathon, follows the current of a stream and reaches a remote wooded area which is a safe environment in which to stay. This site in Carya where the chapel of Zoodochou Pigis (the life-giving source) [i.e. a water supply] with the Holy Water stands today, is where Agathon hid the Holy Relics and built his hermitage.

He becomes familiar with the local inhabitants of the nearby villages of Karyni and Penthili, and gains their trust and respect. He reveals his secret and vows that the icon of Panagia (Our Lady) – measuring 0,86 X 0,62 – was painted on wax and mastic by the evangelist Lucas. The icon bore the inscription 'Mitir Theou, Agia Sion', that is, 'Mother of God, Agia Sion'. In those times Jerusalem was called 'Agia Sion'. With the passage of time, the small, humble hermitage evolved into a monastery, where devout men from the neighboring villages came to live.

The elderly Agathon passed away on February 2 in the year 830. The monks, respecting his last wish, continued to keep the icon of Our Lady and the other relics in the monastery crypt. The monks feared the iconoclasts and pirates who ravaged the islands and coastal towns of Asia Minor. In 842, Orthodoxy triumphed and holy icons were raised all over the territory of the Byzantine Empire. From then on the hermitage of Agathon became a pilgrimage. The icon of Panagia by evangelist Lucas became renown not merely on the island but all over facing Aeolis. Two pilgrimages to Agia Sion were equivalent to one pilgrimage to the Holy Land. (THE HISTORY OF AGIASSOS n.d.)

## **Appendix 6 ZUI Research**

The following lists all the resources I was able to locate about Zooming User Interfaces. I provide this in order to give the reader a context for the zooming user interface of this project

### **Articles/Papers**

The rise of Zooming User Interfaces (Svennerberg 2009)

Zoomable User Interfaces by Dmitry Fadeyev (Fadeyev 2009)

Advogato: The Zooming User Interface

Desert Fog [...] describes a state whereby the user of a ZUI has manipulated the interface such that they have no "landmarks" or cues upon which to work out where they are (Jul & Furnas, 1998). This could occur in one of three ways: The user has zoomed in to a point where no information may be displayed on the monitor; the user has zoomed out to a point where ever piece of information on the monitor is too small to be visible; or that they have simply focused on a part of the canvas where there is no information. Without any cues, users have been noted to wander around at random, something predicted by the model of information foraging (Pirolli & Card, 1999) due to a complete lack of scent. Potentially, this is a worse situation than most orthodox interfaces where at least the user can often infer the context of their operations by looking at what is on screen. With desert fog, there is nothing on screen to aid this inference.

However, another possible solution exists to this conundrum. The purpose of searching for information is usually in response to a particular information need.

Once a relevant document is found, the information is used and the need disappears. Research has shown that many people can make perfectly accurate relevance judgements about documents given only a small part of the information (Mochizuki & Okumura, 2000; Tombros & Sanderson, 1998; and Salmoni & Payne, 2002), it may not be necessary for the full information to be presented to the user. Short abstracts, even using simple existing techniques allow a better than chance level of discrimination. Indeed, while no abstract or summary will be as effective as the full document in terms of accuracy of judgement, the speed is greatly improved (Mochizuki & Okumura, 2000). Curiously, Mochizuki & Okumura found that the title alone allowed a level of discrimination equal to that of the full text, though the method used in this study allowed the participants to examine the full text at any time throughout the experiment so this result should be taken with

caution (which the authors acknowledge). Salmoni & Payne (2002) however found that author-generated summaries appeared to provide the best cues to document relevance. Some automatically generated snippets appeared to provide an incorrect context for the participant, though again some information appears to be better than none.

The provision of a small part of the information would provide the following advantages:

Less information is presented to the user resulting in less time to complete the search task;

Less visual clutter meaning that information from more documents may be presented on-screen at any one time;

Fewer resources required of the system as less information has to be shown;

Hornbæk, Bederson and Plaisant (2001) compared ZUI task-based performance against an *overview+detail* interface. The overview+detail interface was simply the provision of an overview of a map (shown in the corner of the display) with the main part of the window visible across the canvas. Like the ZUI, it was concerned with information visualisation. There were two tasks, firstly a navigation task (finding a well-described map object), and secondly a browsing task (scanning for objects that fulfilled a set of criteria). It was found that there was no difference between either in terms of task completion accuracy, with twenty-six participants preferring the overview+detail interface whereas only six preferring the ZUI. Comments from users included "It is easier to keep track of where I am" for the overview+detail interface. However, task completion time was lower for the ZUI. A recall task was also measured to test the participants memory of the maps' structure and content, and again the ZUI was found to allow a better recall.

It may be argued that these types of task do not relate to the range of tasks that a typical user would perform in an everyday situation. Probably the biggest challenge facing researchers would be to devise a set of tasks suitable for analysis that compare a ZUI against an orthodox WIMP user interface. The tasks employed in the earlier study relied upon the navigation of information that was primarily visual in nature (maps). Against a text-based task, an interface that is more textually based may prove more usable.

For visual information, ZUI's do appear to have benefits in that they reduce task completion time while not increasing the errors committed. Further careful research would cast some empirical light upon this matter.

One example taken from the web browser interface would be of bookmarks. I would personally recommend using the phrase *flags* for the ZUI as this should be a readily understood metaphor by most users. Once a required location is reached, it could be marked by the user with a flag, perhaps colour-coded to denote the user

who placed it (or if there are many users, a name, a picture, or a descriptive label). If another user required this location, they could simply examine a list of available flags using search criteria to narrow a long list down to something manageable. Selecting one would bring the user to the flags location (Salmoni 2004).

### Visualizing E-mail with a Semantically Zoomable Interface

We introduce a semantically zoomable interface that displays emails as interactive objects rather than files containing lines of text, as in traditional e-mail interfaces. In this system, e-mails are displayed as node objects called e-mail nodes within a 2.5-dimensional world. The e-mail nodes are semantically zoomable and each may be rearranged to different locations within the plane to organize threads, topics, or projects. The prototype for this system was built using the Piccolo toolkit, the successor of Pad++ and Jazz (Diep & Jacob 2004).

### Piccolo2D Open-Source Community Forum: The Future of Zooming User Interfaces (Chin & Heuer 2009)

### Part 3: Multiples, Navigation, Focus+Context Information Visualization Mini-Course (Munzner 2008)

### Designing Better Map Interfaces: A Framework for Panning and Zooming.

First, there is no single best way to implement panning or zooming functionality in maps since it depends upon both the user (e.g., prior experiences, level of motivation) and the task they are trying to execute. For example, HCI studies have shown that the most efficient text-scrolling tool depends on how far the user needs to move in the document. Hinckley et al (2002) demonstrate that short scroll distances (<100 lines of text) are covered more quickly with a wheel mouse, and larger distances (many pages of text) can be traversed more rapidly with the ScrollPoint device. Cockburn and Savage (2003) also found that the efficiency of panning and zooming methods for both maps and text documents is closely tied to the size of the information space the user is trying to navigate. Thus, there is no one-size-fits-all solution to panning and zooming, and good mapping systems incorporate multiple methods for panning and zooming.

The second problem in our search for “natural” map interface designs is that people acquire interface skills largely through exposure and repetition. Hence, those interface designs that are common (e.g., magnifying glass zoom icon) will often feel the most natural although they may not represent the best possible implementation. For example, the QWERTY layout of the typewriter/computer

keyboard feels natural and is preferred by most users not because it is an inherently superior layout, but simply because it is familiar. In other words, an interface designed to be intentionally inefficient has become universally popular (the QWERTY layout was designed to slow-down typists since early typewriters jammed easily). More importantly, the QWERTY layout was a machine-centric solution because it forced users into a work mode dictated by the limits of the technology rather than the needs of the user.

It is our contention that (1) design decisions made in the early days of emerging technologies are often adopted uncritically when better alternatives may exist, and (2) those early decisions are often driven more by the technological limits of the day than by a larger understanding of users' needs. Although typewriter technology improved to address the issue of jamming, the design of the keyboard had been irrevocably cast. Are we at risk of standardizing upon another QWERTY-like interface with digital mapping systems? Have machine-centric solutions been foisted upon map users, and thereby constrain how we work and think? Have the dominant GIS software and online map vendors artificially constrained our thinking about what a map interface ought to look like? (Harrower & Sheesley 2005)

iMapping – A Zooming User Interface Approach for Personal and Semantic Knowledge Management (Haller & Abecker 2010)

Context and Interaction in Zoomable User Interfaces (Pook *et al* 2000)

Navigation Patterns and Usability of Overview+Detail and Zoomable User Interfaces for Maps (Hornbæk *et al* 2002)

Interaction and Context in Zoomable User Interfaces (Pook 2001)

iLook: a Zoomable User Interface to support the interaction with home appliances (Carnesecchi *et al* 2011)

Humane Interface Review/Summary (Wei-Jing Zhu 2005)

A summary of Humane Interface design rules (Karpinski 2009)

## **Implementations**

Raskin for Mac

Inspired by Macintosh visionary, Jef Raskin, our zoomable user interface shows you all the stuff on your computer on a single surface. Using zoom and pan to view, arrange and open documents feels so right. In minutes you'll appreciate the

simplicity and intelligence of our answer to the traditional desktop. (Raskin | Beyond Desktop n.d.)

Prezi allows the creation of zooming presentations. (Prezi 2012)

#### Zooming User Interfaces in Comics

Cartoonist Daniel Merlin Goodbrey is experimenting with new ways to experience comics. In the comic PoCom-UK-001 he uses a Zooming User Interfaces for the viewer to read the cartoon. (Goodbrey 2012)

#### Firefox Concept Mobile Browser

Aza Raskin, Head of User Experience at Mozilla Labs, has developed a concept for a Firefox Mobile browser that utilizes a zooming interface among other interesting interaction techniques. (Raskin 2010)

#### Aurora

Aurora is a future concept browser that Adaptive Path has developed for Mozilla Labs. It utilizes a lot of new interaction ideoms, zooming being one of them. In this interface there's also the Z-axis that represents time. The older the content, the farther away it is. It also fades with time. Check out this article [Visualizing the age of content](#) to read more about this concept.

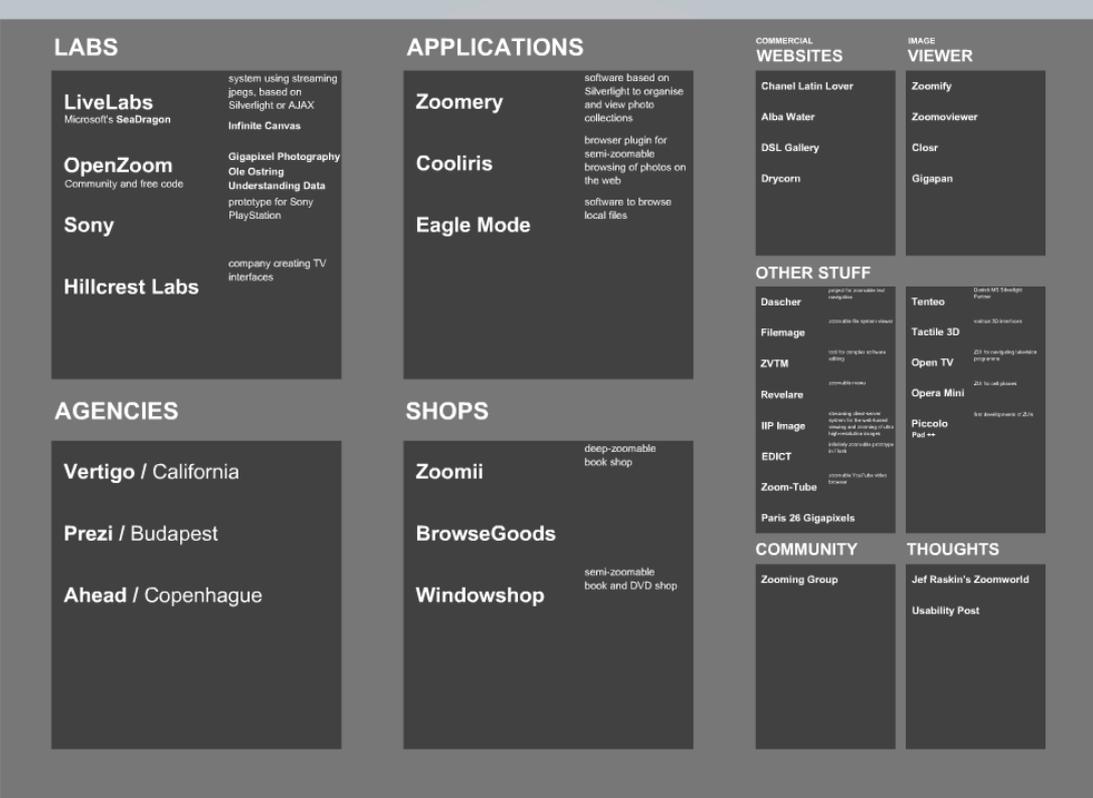
(Svennerberg 2012)

#### Zoomism ZUI website

The image below is from the website and has links to other ZUI implementations.

(Voos 2011)

# ZUI websites and applications



(Voos 2011)

## MediaVis 2.0

The MedioVis 2.0 project aims at providing natural user interfaces for information seeking and exploration in multimedia libraries. (Mediovis 2010)

## ProjectCecily

ProjectCecily is a user interface concept that combines the functionality of a wiki with a ZoomingUserInterface. Built entirely using pure HTML, JavaScript and CSS. (Ruston 2008)

## PyZUI

PyZUI is an implementation of a Zooming User Interface (ZUI) for Python. It uses the PyQt toolkit, and runs on both Linux and Windows (although obviously Linux is the recommended platform). (Roberts 2009)

## iMapping

An iMap is comparable to a large whiteboard where information items can be positioned like post-its but also nested into each other. Spatial browsing and zooming as well as graphical editing facilities make it easy to structure content in

an intuitive way. iMapping builds on a zooming user interface approach to facilitate navigation and to help users maintain an overview in the knowledge space. (Haller *et al* 2011)

## Conjure

Conjure transforms desktop to a ZUI (Conjure 3 2008)

Squidy: A Zoomable Design Environment for Natural User Interfaces Squidy is an interaction library which eases the design of natural user interfaces (also known as "post-WIMP interfaces") by unifying various device drivers, frameworks and tracking toolkits in a common library and providing a central and easy-to-use visual design environment. (Squidy 2010)

## Image Viewers

Zoomorama is a Flash based tool for making zoomable image albums.

### Zoomorama Closes Down

Zoomorama has not found its market. Even after increasing sales significantly for Darty.com, our sales cycles did not shorten. The balance of income to cash burn had become untenable and we have taken the decision to close (Zoomorama 2010).

## Frameworks/Research

### Piccolo

Piccolo is a toolkit that supports the development of 2D structured graphics programs, in general, and Zoomable User Interfaces (ZUIs), in particular. A ZUI is a new kind of interface that presents a huge canvas of information on a traditional computer display by letting the user smoothly zoom in, to get more detailed information, and zoom out for an overview. [...] Why use Piccolo? It will allow you to build structured graphical applications without worrying so much about the low level details. What exactly is it? Piccolo is a layer built on top of a lower level graphics API. There are currently three versions of the toolkit: Piccolo.Java, Piccolo.NET and PocketPiccolo.NET (for the .NET Compact Framework). The java version is built on Java 2 and relies on the Java2D API to do its graphics rendering. The .NET version is built on the .NET Framework and relies on the GDI+ API to do its graphics rendering. This makes it easy for Java and C# programmers, even

those targeting PDAs, to build their own animated graphical applications (Piccolo Home Page n.d.).

### Deep Zoom

Deep Zoom provides the ability to interactively view high-resolution images. You can zoom in and out of images rapidly without affecting the performance of your application. Deep Zoom enables smooth loading and panning by serving up multi-resolution images and using spring animations (Deep Zoom n.d.).

### OpenZoom

OpenZoom is an open source framework for the use of high-resolution images and Zoomable User Interfaces on the web. It uses an implementation of the Deep Zoom technique in Flash. OpenZoom SDK is a toolkit for the Adobe Flash Platform (OpenZoom 2012).

### Zooming User Interfaces

MRL has lead research efforts in Zooming User Interfaces (ZUIs). These interfaces create an intuitive information landscape - the user moves "further away" to get an overview, or "closer" for more detail, while keeping a sense of orientation and structure that traditional "pop-up" windows and dialogues can't match (Zooming User Interfaces 2009).

### Zoomooz

Zoomooz is a jQuery plugin for making web page elements zoom. It can be used for making Prezi like slideshows and for zooming to images or other details (Aukia 2012).

### Seadragon

Seadragon AJAX Library for embedding single high-res images into a web page. Seadragon Ajax is a Deep Zoom viewing library implemented in pure JavaScript. It supports the same single image file format that Silverlight Deep Zoom uses, but does not support Deep Zoom Collections (Microsoft.com 2011).

### ZOIL Software Framework

The ZOIL Software Framework for C#/WPF/Surface SDK: Distributed Zoomable User Interfaces for Natural Interaction in Multi-User, Multi-Display and Multi-Device Environments (Zöllner 2011).



## **Appendix 7 Interface Research**

Interaction between humans and computers occurs at the user interface. Human-computer Interaction (HCI), a branch of computer science, involves the study, planning, and design of the user interface. In order to give the reader a context for the user interface of this project I will briefly discuss the history of the user interface and the key players in its development.

### Douglas Englebart

One of the early pioneers of the user interface was Douglas Englebart. Whilst at the Stanford Research Institute (SRI) in the 1960's, Englebart lead the Augmentation of Human Intellect project, that developed the On-Line System, which incorporated a mouse-driven cursor and multiple windows used to work on hypertext<sup>32</sup>. The invention of the mouse was just a small part of Engelbart's much larger project, aimed at augmenting human intellect. This research was inspired in part by the memex desk-based information machine suggested by Vannevar Bush in 1945.

Engelbart's work directly led to the advances at Xerox PARC, a research and development company in Palo Alto, California, which is credited with developing the first computer to demonstrate the desktop metaphor and graphical user interface (GUI). The Alto, as it was known, greatly influenced the design of personal computers during the late 1970s and early 1980s, notably the Apple Lisa and Macintosh, and the first Sun workstations.

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<sup>32</sup> Hypertext is text displayed on a computer or other electronic device with links to other text that the reader can immediately access. This is now a very familiar way of working that all that use the WWW engage with.



*Figure 6 - The Xerox Star Workstation - the first GUI.*

### Alan Kay

Alan Kay led the research group at PARC Xerox that was responsible for the development of the Alto. He also contributed to the development of Ethernet, laser printing, and the client-server network model. Steve Jobs, Jeff Raskin and some other Apple pioneers visited PARC in 1979, and concluded that Kay's ideas were the way of the future. The Alto and the idea of a windowing GUI was a direct inspiration for the Apple Macintosh computer. Even Microsoft Windows is an offshoot of Kay's ideas.

The GUI and mouse made the use of computers far more intuitive and led to their rapid uptake by the public. The GUI itself became an area of considerable research and a major branch of computer science, and led to the field of User Experience Design, a term coined by Donald Norman, while he was Vice President of the Advanced Technology Group at Apple.

### Donald Norman

In his own words: "I invented the term because I thought human interface and usability were too narrow. I wanted to cover all aspects of the person's experience with the system including industrial design, graphics, the interface, the physical interaction, and the manual" (UX Design Defined 2010).

### Ben Shneiderman

Ben Shneiderman is an American computer scientist, and professor for Computer Science at the University of Maryland Human-Computer Interaction Lab at the

University of Maryland, College Park. He was the Founding Director (1983-2000) of the Human Computer Interaction Lab at the University of Maryland, where the ZUI platform (Piccolo Home Page n.d.) upon which I have built my interface, was developed.

Ben Shneiderman has been attributed with the following mantra in relation to viewing large amounts of information.

Overview first, zoom and filter, then details-on-demand (Shneiderman, 1996).

This project conforms to these requirements as it allows the audience to see an overview of the entire mapping and provides the ability to zoom into areas of interest. Furthermore, as items increase in size through the zooming mechanism, more of that items detail is revealed. This is most apparent in text items in the mappings, which display only a heading when reduced in size through zooming. As items increase in size due to zooming, the heading is replaced with the actual textual content.

Shneiderman conducted fundamental research in the field of human-computer interaction, developing new ideas such as the direct manipulation interface in 1982, and his eight rules of design. He is also attributed with the development of the user interface for highlighted phrases in text, which became the hot link of the WWW. He continues to work in information visualization, visual analysis tools for time series data, high dimensional data and social network data, and the visualization of temporal event sequences. He was also responsible for defining the research area of universal usability in order to encourage greater attention to the diversity of users, languages, cultures, screen sizes, network speeds, and technology platforms.

Jakob Neilson

While Shneiderman's eight rules of design are a staple of usability testing, it is Jakob Neilson, who is considered the foremost expert in Web usability. Nielsen worked in interface design at Sun Microsystems Inc., where he became obsessed with usability, an area he has written about widely and in which he holds 38 patents. Nielsen advocates minimalist design, and stipulates that Web sites should be laid out simply, with clear headlines and labels, directories of what's on the site, summaries of new information, and easy-to-spot search buttons (Hamilton 2000).

Ted Nelson

Ted Nelson, an American sociologist, philosopher, and pioneer of information technology, coined the terms "hypertext" and "hypermedia" in 1963 and published them in 1965. Nelson founded Project Xanadu in 1960 with the goal of creating a computer network with a simple user interface, and devoted much of his adult life to working on Xanadu and advocating it. The effort is documented in his 1974 book *Computer Lib/Dream Machines* and the 1981 *Literary Machines*.

ZigZag is Ted Nelson's trademark on a data model he has designed for computer interaction, both for users and between programs. The design is centered around an information structure called a zzstructure and its interactive visualizations. Nelson's stated goal is on one hand a platform for the Project Xanadu hypertext and on the other a complete computing system built on new conventions. Instead of the conventional textual formats and tree structures, zzstructure is a multidimensional extension of a spreadsheet whose cells can contain various kinds of data.

The zzstructure is similar in form to a doubly linked list that is linked doubly along multiple axes (each dimension corresponds to a single back and forward link, and there are an arbitrary number of dimensions). Each node exists on all dimensions, though it may or may not be connected to anything in that dimension.

I was introduced to The Xanadu project and Ted Nelson in 1998 whilst undertaking my Master of Arts (Media Arts). Andrew Pam, who collaborated with Ted Nelson on the Xanadu project, introduced this work to me.

Conceptually I found the project fascinating but from a practical perspective very confusing and difficult to grasp from the user interface that I experienced at the time. I have since revisited the project and have looked at an implementation of the zzstructure in the application *gzigzag*. I still find the interface very confusing and not particularly user friendly, with only provision for textual objects in the space and a very rigid layout constraints.

Furthermore, I examined XanaduSpace, a considerably more, user-friendly implementation of Ted Nelson's Xanadu project. This interface is very similar conceptually to the zooming platform that I have worked with (i.e. Piccolo), with the major exception that it is a three dimensional space. Piccolo, on the other hand, is deemed a two and a half dimensional space. There were good reasons

for the selection of this design paradigm:

Its all very well, but why isn't Pad++ 3D?

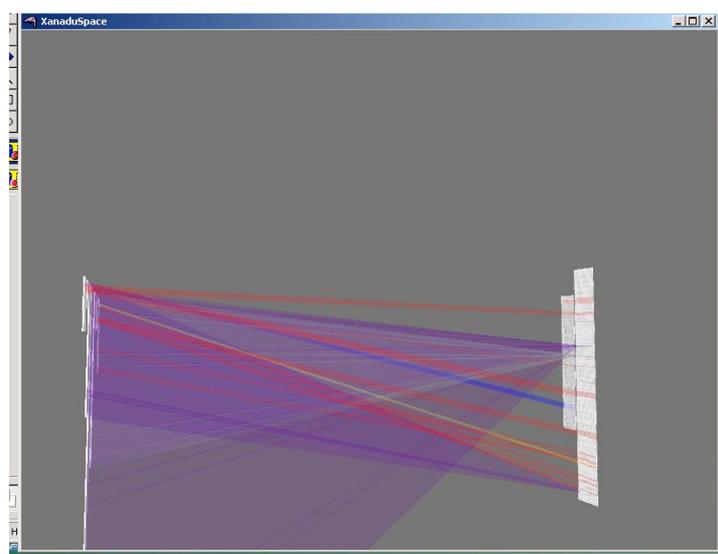
3D systems are typically hard to navigate using current display and pointer technologies. They also require high levels of computing resources. It's not obvious that a 3D interface is appropriate for a handheld device or for a cheap home computer. Pad++, on the other hand, can be implemented very efficiently using a small home computer, and is easy to navigate using a mouse.

<http://www.cs.umd.edu/hcil/pad++/faq.html#a301>

Pad++ was the precursor to Piccolo. Pad++ was developed using Tcl/Tk, a graphics rapid prototyping language. First reference to Pad++ is in this paper from 1994. Pad++: A Zooming Graphical Interface for Exploring Alternate Interface Physics Bederson, B.B. Hollan, J.D. ACM UIST '94, 1994.

<http://www.cs.umd.edu/hcil/pad++/papers/>

I found that XanaduSpace was slow and responded poorly to users interactions, despite there being only a few documents in the interface. The Pad++ creators reasoned that three-dimensional spaces require high levels of computing resources and this still seems to be the case as evidenced by this experience with XanaduSpace. XanaduSpace also imposed very rigid layout constraints on its documents that restrict layout possibilities. The three-dimensional space of XanaduSpace allows rotation of the viewing camera but I fail to see the usefulness of this as when rotated 90 degrees the viewer can only see a thin slither that represents all documents.



*Figure 7 - XanaduSpace with camera rotated 90 degrees*

In most instances, documents would be viewed from the front, so I do not see what advantages are offered by a three-dimensional space over the two and a half dimension space offered by Piccolo. The disadvantages are many. For example, the increased processing power required, and hence the poorer performance and a greater risk of user disorientation. Furthermore, XanaduSpace allows zooming in and out to the point where the content is not visible, with the only recourse being the Reset Camera Position function, which returns the view to the original camera position. Also as is the case with most zooming spaces, there is no zooming feedback.

I contacted Andrew Pam, who collaborated with Ted Nelson in the development of many versions of xanadu, in relation to the Xanadu implementation that allowed the user to store, organise and resize images, texts and sounds in a 3 dimensional, zoomable, rotatable, fly through space. He confirmed that this was never produced in full although this was always the intent.

The interface developed for this project incorporates features to improve the user experience that XanaduSpace has neglected. For example, it is not possible to zoom out so far that the content is no longer visible. Zooming in is limited to the point where content is at the edge of the camera, never beyond this. A *show all* button is provided so that all content can be viewed, and a *back* button allows the viewer to return to previous views.

As mentioned previously, my first exposure to ZUI's was by way of Andrew Pam, a computer scientist that worked on the Xanadu project in 1998. At that time, the ZUI platform that I worked with was called Pad++.

Where did Pad++ come from?

Ken Perlin at New York University came up with the initial zoomable surface concept. He and David Fox implemented the first versions of Pad, which were the precursors to the current implementation, Pad++.

Pad++ was designed by Ben Bederson and Jim Hollan while at Bellcore, and implemented by Ben Bederson. They both moved to the University of New Mexico where they developed the bulk of Pad++ in collaboration with Jon Meyer and Ken Perlin at NYU.

Now, Ben Bederson has moved to the University of Maryland, College Park where he is continuing responsibility for the further development of Pad++. Jim Hollan

moved to the University of California, San Diego where he is building applications using Pad++ (Pad++ n.d.).

Pad++ was ported to the Java language and renamed Piccolo. Two variations exist: Piccolo.java and Piccolo.c#.

Piccolo.Java was developed at the University of Maryland, by a team led by Professor Ben Bederson (Piccolo Home Page n.d.).

## Edward Tufte

Tufte's writing is important in such fields as information design and visual literacy, which deal with the visual communication of information.

## Appendix 8 Usability Tests

Usability Feedback 23/03/12

1. Separate authoring and viewing functionality. The ability to perform some authoring whilst in viewing only mode has been a major source of confusion for usability testers thus far.

Action:

Clearly separate authoring and viewing modes. Concentrate on improving usability for viewing mode only as it is beyond the scope of this project to provide a fully functioning, usable authoring interface.

*Implemented. Modes clearly separated improving usability for audience.*

2. Search Facility provided no feedback when item not found.

Action:

Provide meaningful feedback. Dialog alerts user to no match, otherwise matched items highlighted and camera zooms to contain all matching items.

*Implemented*

3. Mouse Wheel unable to scroll texts that display scroll bar.

Action:

Implement.

*Have made several unsuccessful attempts. Dragging the scroll bar works. Have noticed that there are many commercial programs where this feature does not work. For example, the Styles menu in Microsoft word will not scroll with the mouse wheel. This has raised the possibility that this functionality is not fully integrated into the API's that programmers use to create dialogs.*

4. Mouse Wheel for zooming.

Action:  
Implement.

*Implemented giving user a more familiar way of zooming but obviously relies on mouse having a wheel.*

5. Need some text to inform user what playback buttons do.

Action:  
Add Text

*Have moved playback functionality to tools menu.*

6. Speed of playback control

Action:  
Provide means to control speed.

7. User disoriented after zooming content to such a small size that it effectively disappears.

Action:  
Ensure minimum size of total content.

*Implemented. Total content never too small to see.*

## Usability Feedback 17/4/12

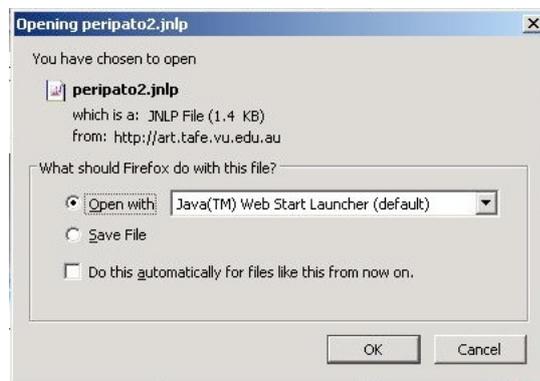
1. Some concern about the number of items that needed to be clicked to launch Java applications.

Action:

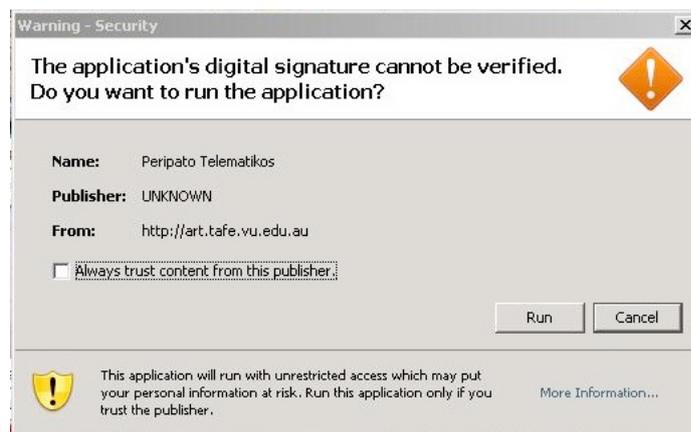
remove alert indicating QTJ installed, and only show when not.

Cant remove on first load:

- a) Run/Save dialog box (for jnlp file)



- b) Trust dialog



Each of these dialog boxes provides a facility for bypassing on subsequent loads (e.g. Do this automatically for files like this from now on.) Therefore, if user selects these will not see a) or b), so application is launched with a single click.

2. JNLP dialog box has options for run and save. On test machine, save was default selection, so user inadvertently just saved jnlp file and did not run.

Action:

- check what happens if save selected by default. Will it eventually run?
  - o *No simply saved file.*
- Is save a browser option or can I control it through jnlp?
  - o *A browser option in Firefox.*
- How do I help user?

The instructions provided in the Appendix give sufficient information for a user to be able to start the application despite this problem and basically involves locating the downloaded file and double-clicking it.

3. Launching of application from web browser via jnlp mechanism. This is still problematic for some of the abovementioned reasons. One suggestion was to create an executable that could be downloaded. Unfortunately this creates other problems as there is with this method no way to determine if Java is installed, and that is the part of the reasoning behind the web launched approach. Furthermore, two separate executables would need to be created (ie one for OS X and one for Windows) undoing the advantages of Java programs. Providing a jnlp file on a disc may be suitable for examination but not a real solution.

4. Toolbar did not refresh properly after finished loading.

Action:

force refresh of toolbar after loading of content finished

5. User found it difficult to unselect items. Expected to be able to click in empty space to deselect.

Action:

enable deselection by clicking empty space.

*Implemented*

6. Texts in peripato. User unable to scroll page by dragging scroll bar slider.

Action:

enable scrolling by moving dragging scroll bar slider.

*Implemented. User is now able to drag scroll bar*

7. Texts in peripato. Some discussion as to how these should be presented. One suggestion, have a text link in tools menu. When selected, text to load menu appears like mapping selection menu. Not clear on what happens next. User preferred a separate page on top of everything a la JQuery overlay.

I would prefer that the text be loaded into the interface allowing for the possibility of associating texts with other content through spatial arrangement or links. Also allows author to employ hypertext poetics for content.

Action:

Texts related to particular mappings included in those mappings, e.g. Townsville mapping, will include Townsville and Collective Works extract from exegesis. "Talk" mapping will be renamed to exegesis and will include all texts.

8. Tools menu. User preferred tools menu to be permanently displayed along right edge of interface, so that user always has access to information. I want this to be optional so that user can navigate content without loss of screen space.

Action:

We agreed to the following compromise. Display menu on start up, and allow for minimizing so that visible at start, and always visible whether collapsed or fully open.

Also ensure that keyboard shortcuts are available so that user does not have to open tools to complete a task such as 'select all'.

*Implemented*

9. Scrolling text display. One user feels that this doesnt add anything, whilst other thought that it was a type of debugging tool.

Action:

Remove as it no longer serves original intended purpose.

*Implemented*

10. Zooming into space between two items leaves user looking at blank screen and disoriented.

Action:

Research if possible to limit view so that something is always visible in a similar fashion to the example I was sent by Aaron.

*Implemented. Interface will never zoom into empty space.*

11. Date and Time on MouseOver.

Action:

Enable Date and Time display when mouse over.

*Implemented.*

12. Continuous panning when mouse off top or bottom edges.

Action:

have a solution just need to test.

*Implemented*

13. Glitch observed in Sao Paulo mapping. User double clicked very small image, zoomed in, double clicked outside of this (which is the larger image at back) an all content (except bigger image in back) reduced in size and positioned in top left hand corner of larger image.

Action:

Try to replicate and troubleshoot.

Unable to duplicate on OSX, nor on Windows? User realized that reloading could reset the mapping.

14. Users wanted quick start text as part of Tools

Action:

Remove from current location and incorporate in tools menu..

*Implemented.*

Application tested over public wi-fi. No perceivable change in performance.

1. Change text on mappings page. *“A java web start application will launch and the project content will commence loading. Verify your java installation.”*

Action:

Text to be changed to: “This application requires Java. Click here to check.”

*Implemented*

2. User selected “Verify Java installation” and was presented with some security dialog boxes, which required user to select “Allow” before the Java checker could complete.

Action:

In the small window that pops up for the Java test, include instructions to user to “allow” security alerts that appear.

*Implemented*

3. User inevitably moved Help window to top and left of Tools window.

Action:

Position at startup.

*Implemented*

4. Content that appeared below invisible Help window was not selectable.

Action:

Ensure that all content can be selected regardless of Help window.

*Implemented*

5. Navigation Help page no longer required in all mappings.

Action:

Remove Navigation Help pages from all mappings.

*Implemented*

6. Users want “Show All” button on toolbar.

Action:

Replace Show All button.

*Implemented*

7. Back button still confusing.

Action:

Make Back button return user to previous view.

*Implemented*

8. Users want to be able to deslect by clicking in white space

Action:

enable deselection by clicking white space.

*Implemented*

9. Mac laptop track pad allows zooming of content using two fingers.

Action:

none required.

10. Mappings-Load confusing

Action:  
change to Mappings – List

*Implemented*

11. Users suggested that selecting a mapping would be more intuitive if user is presented with a grid similar to that on starting web page

Action:  
Create a page that looks like the grid page, and allow user to select mapping through this page. Incorporate as a page similar to tool and help.

*Implemented*

12. Users wanted consistency in the way text appear in mappings

Action:  
-Reposition texts so that at startup texts just show title.

13. Users wanted texts to be scrolled to beginning rather than at end

Action:  
Ensure that all text items display the content from the start scroll position

*Implemented*

14. Alert box that states number of MMS and SMS to be loaded found to be meaningless.

Action:  
remove alert box and incorporate this information in the progress bar that currently states “loading project content”. E.g. This mapping contains XX images.

*Implemented*

15. Users felt that with improved usability (esp Mouse wheel and track pad) no longer a need for selecting multiple items using marquee.

Action:

Hide this function from user.

*Implemented*

16. Playback of audio and video failed with no feedback on mac laptop.

Till this last test, this feature has worked on all platforms tested. The system was OSX 10.6.2 which I believe may have a new implementation of Java. No warning about QTJ was raised indicating that the software passed the required test. Need to test further to see if I can ascertain cause.

Action:

Investigate an alternate framework for the playback of audio and video as QTJ is officially deprecated.

## Appendix 9 The Software/Hardware System

The development of software can be an enormous task, requiring complex tools and a team of people that can constitute software engineers, programmers, system analysts, information architects and project managers.<sup>33</sup> Software design and development makes use of systematic methodologies that have been developed heuristically. This is to be expected when we are working with tools that have few or no precedents. After several decades of trial and error with software development, certain key criteria emerged to define well-written software. Object-oriented programming (OOP) has emerged as the key conceptual approach to software development. OOP requires that the software system be conceptualised as comprising discrete objects that communicate with each other to realise the functionality that is required. Each of these 'objects' can have a direct correlation to a real world object, or be totally abstract. The point is that these 'objects' provide the building blocks of the software system. Each 'object' usually has a unique identity and purpose. It is characterised by its attributes and what it can do. For example, the Java application written for this project is made up of objects that have names such as MMS, MenuBar, ProgressBar, etc., each name reflecting the purpose of the object.

The software has been realised using what are known as scripting languages, and Java<sup>34</sup>. PHP is the predominate scripting language used. It is used to perform functions such as:

- alerting the administrator by email/SMS that new content has been received by the gateway;
- deconstructing the messages and inserting the salient content into the mySQL database (this also requires the use of another scripting language, SQL<sup>35</sup>);
- extracting the content from the database to populate the online Java application when mappings are being viewed and polling the database to check for new content whilst a mapping is being viewed.

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<sup>33</sup> I have been involved in such large-scale developments, during my employment at NEC (telecommunications research and development) and Kodak (digital imaging research and development).

<sup>34</sup> Scripting languages differ from compiled languages such as Java. A scripting language is used in its human readable form, whereas a compiled language undergoes a compilation process before it can be used. The compiled program is not in a human readable form.

<sup>22</sup> Structured Query Language

As the name suggests, the Java Web Start Application, Telematikos, uses the open-source, object-oriented language developed by Sun Microsystems known as Java. This language was developed with the specific intent of creating a cross-platform language, i.e. Java applications will run in any operating system and Java applets can be embedded in web pages.

Telematikos required considerable effort to develop and implement and, as I have written above, forms a significant part of the research. The source code (i.e. the software written in Java) comprises approximately 17,000 lines of code. A description of the sequence of events that this software performs follows: Content captured by participants (i.e. the constituent components of the mappings) is sent immediately via MMS (or SMS in the case of plain text) to a custom hardware and software system, comprising a gsm/gprs modem, sms/mms gateway software, php scripts and a mysql database. I describe these components of the system in greater detail below.

MMS is an acronym for Multimedia Messaging System. It is similar to the more commonly used SMS or text message, but with the added capability of incorporating images, audio and video content in a single message. As an integrated service it offers some advantages over a custom application, a major one being standardisation. A custom application would allow for specific tailoring of the mobile phone in relation to this project, but would be difficult to implement as mobile phone operating systems come in many flavours and a separate application would need to be written for each mobile phone type, further complicating the experience of using the phone in this project. Furthermore, a custom application would require the participant to familiarise themselves with yet another piece of technology. My experience and research has shown that technological complexity is an obstacle to open participation. However, most mobile phones have MMS capabilities, and many participants could be expected to be familiar with it.

The message sent by a participant must be 'marked' so it can be identified by the system. This requires that the message use the postcode (or other previously agreed upon identifier) of the place being 'mapped' as its subject line. This is more of an issue when several mappings are being run concurrently and the system needs a means by which it can differentiate between content for different mappings. There is also the provision for using the mobile phone numbers as a means of identifying the appropriate mapping that the content is intended for. For

example, participants in a project register their mobile phone numbers with the administrator of the mapping. These are then entered into the database and assigned a mapping. When a message is sent, the system recognises the sender and the mapping that the sender is contributing to.

All entries are stored in a mySQL database and await approval. Approval of content before it is released into the public realm is a major consideration during these times of heightened anxiety about the use of mobile phones for capturing unsolicited images:

Photographers' blogs are tangled with long threads of discussions about what may or may not be allowed, and are bulging with stories of police, security and members of the public stopping them from taking photographs. (Giles, 2007, p. 23)

The content needs to be vetted for appropriateness and suitability. A secure web page is provided for administrators of the project that displays the content as it is received in real time, and provides a simple mechanism for approval. Once approved, the content is available for viewing. When a mapping is being viewed through the Java application, the database is polled at regular intervals to check for newly approved content. If new content is available it is loaded immediately into the appropriate mapping. This polling can be stopped by a simple menu selection as in situations where no new entries are expected checking for new entries is futile and generates unnecessary network traffic.

There is an exception to the approval process detailed above. If the sender's mobile phone number is registered with the system it is considered a trusted source, so content will be automatically approved, eliminating the need for manual approval.

The Java Web Start application allows for the participants to return to the site and view their submitted content, and manipulate this content in relation to other content, closing the loop by giving control of the layout of the mapping to the participants. The content can also be manipulated in further ways:

- text annotations can be added to existing content, with the option of leaving this text visible or available on demand;

- links can be created, associating content with other content. The links can be made visible if a visitor wishes to see the associations created;
- the spatial layout can be saved.

Please note that only participants with the authority to upload and manipulate the content can access the abovementioned functionality. The general audience will only be able to view and navigate the mappings without altering the content. The authoring aspect of the software was never intended for public release as it is beyond the scope of this project to provide a fully functioning and usable authoring environment. Rather, the project aimed to provide an interface where the audience could view the documentation of the walks, which I have provided.

In a nutshell, this scheme allows the content to be manipulated by authorised participants allowing for an emergent montage of media elements that are the constituent components of the mappings.

Telematikos implements an experimental interface based on the framework developed by the Human-Computer Interaction Lab (HCIL) at the University of Maryland that allows spatial manipulation and ‘zooming’ of all content. (Human-Computer Interaction Lab)

Zooming is an interface paradigm I encountered first in 1997 while working on *AuthorWhere: A Multi-Linear Storyboarding System*. This was an investigation and development of a prototype for multimedia authoring. In terms of navigability it has the greatest efficiency in comparison to other interface schemes.

Essentially, this means that the interface allows for the navigation of a large data set in a more efficient manner than any other option. It is also referred to as a 2-½-dimension interface as the zooming gives the illusion of a 3rd-but restricted-dimension. Zooming was relatively unknown to interfaces until Apple’s OS X where Apple adopted it in a minimal way for the Dock and Dashboard and Exposé GUI elements in 2003. It is with Exposé that this feature is most apparent: moving the mouse to a designated corner of the OS X desktop causes all open windows to reduce in size and appear as a cluster of smaller windows on the desktop. This is very similar to the zooming interface, but a zooming interface provides much greater control over the level of zooming. The interface is discussed in greater detail in the section: Interface.

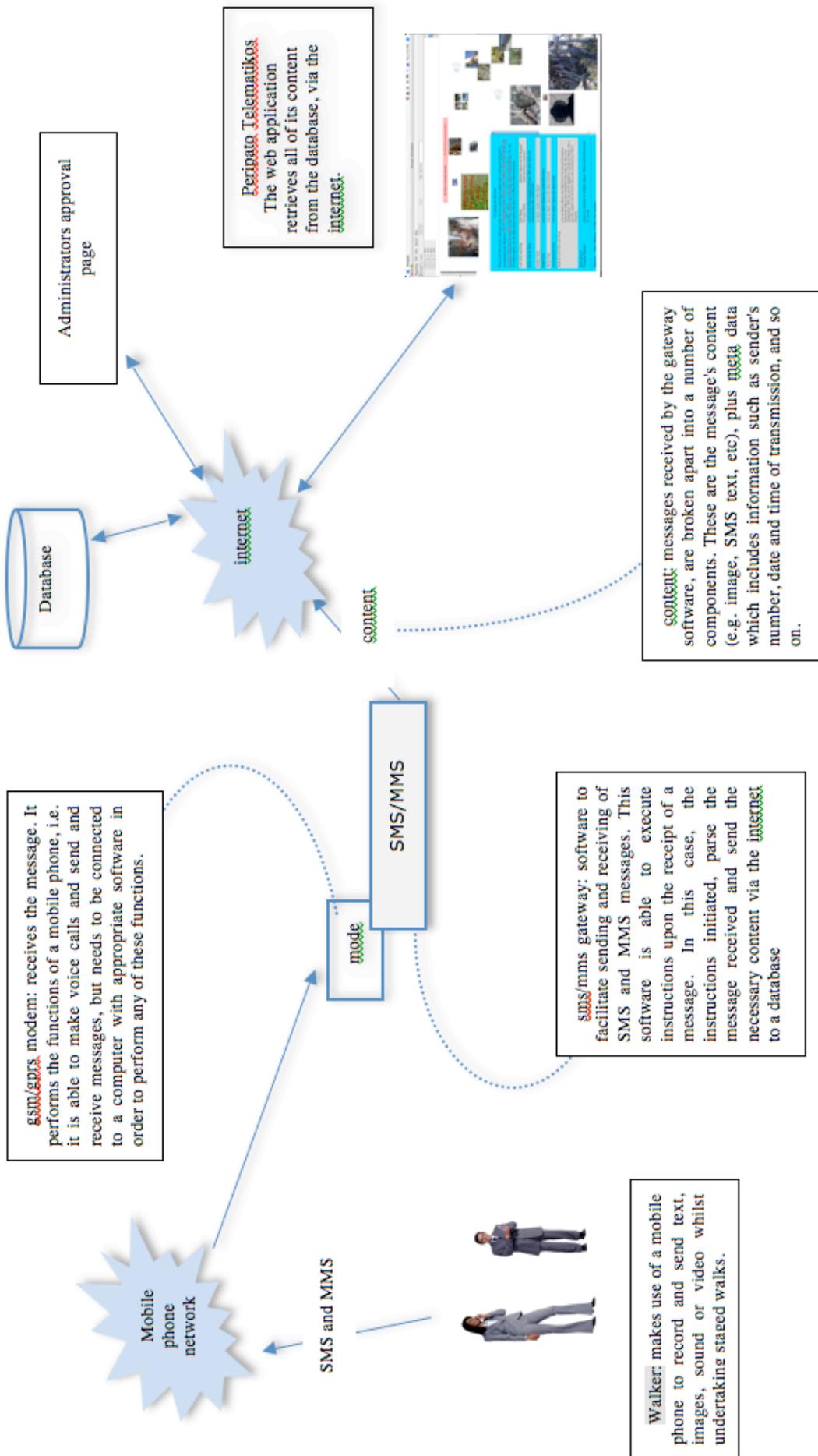


Figure 8 - System Diagram

Thus far I have discussed the most visible aspects of the technology enabling the project. Other components that play a crucial role include, the gsm/gprs modem, sms/mms gateway software, php scripts and the mySQL database:

the gsm/gprs modem.

The modem enables communications over the mobile network and the handling of MMS messages in MM1 mode (essentially duplicating the functionality of a mobile phone). The computer that the modem is attached to initiates the sending of messages and other telephony functions, and is also responsible for the reception of incoming messages.

Other modes than MM1 are available, such as MM7, which delivers the message directly over the Internet, rather than over the air, but this requires a contract with a telecommunications carrier.

sms/mms gateway software.

On its own the modem has limited functionality. It comes with simple software to send and receive an SMS, and make a voice call. In order to implement the sending and receiving of MMS messages dedicated software is required as handling MMS messages is not as straight forward as an SMS message.

This project uses / is using the commercial product nowSMS<sup>36</sup>. It provides all the functionality needed to implement the sending and receiving of MMS messages and more. The open source community also offers gateways, for instance [Mbuni: Open Source MMS Gateway<sup>37</sup>] but the effort and time required to establish a system must be weighed against the cost of a commercial off-the-shelf product.

php scripts.

The gateway provides some simple mechanisms for handling the messages. Ultimately, the specific application will need to implement its own handling. The gateway is configured to execute php scripts whenever a new message arrives. The script's prime purpose is to record the new message's details into the database, and if necessary alert the project administrator who needs to approve

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<sup>24</sup> <http://www.mbuni.org>

<sup>25</sup> <http://www.nowSMS.org>

the content sent. This can be done in many ways, from emailing the administrator to sending the MMS to the administrator for remote approval.

mysql database.

The database contains many interrelated tables to facilitate the smooth implementation of the project.

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