Digitally disabled; exploring how digital technology can alter constructions of disability

Conor Lacey

A research paper submitted to the University of Dublin,

in partial fulfilment of the requirements for the degree of

Master of Science Interactive Digital Media

2013

Declaration

I declare that the work described in this research paper is, except where otherwise stated, entirely my own work and has not been submitted as an exercise for a degree at this or any other university.

Signed: _____

Conor Lacey

01/03/2013

Permission to lend and/or copy

I agree that Trinity College Library may lend or copy this research Paper upon request.

Signed: _____

                          Conor Lacey

                          01/03/2013

Table of Contents

List of Figures

Acknowledgments

I would like to thank my supervisor Nina Bresnihan for providing me with feedback throughout the writing of this thesis. I would also like to thank my family for supporting me during this M.Sc.

Abstract

Title: Digitally disabled; exploring how digital technology can alter constructions of disability.

Author: Conor Lacey

Supervisor: Professor Nina Bresnihan

This thesis analyses the role of location-based media and video games in constructions of disability. Disablism is outlined as a socio-cultural process that marginalises people with physical impairments and compounds issues of accessibility. The digital applications and the paratextual issues surrounding them are explored for their ability to enable members of the disabled community to resist normative notions of the built environment.

Affect theory is used throughout this thesis so as to frame how experiences of disability are subject to change. Patricia Clough describes affect as a way of measuring how the bodily capacities of a socio-cultural group rise and fall, of how their ability to take meaningful action in their society and to produce change is influenced by external forces. It is the purpose of this thesis is to explicate how the use of digital media by the disabled community increases or decreases their ability to affect issues of spatial inequality.

This thesis finds that while the location-based media and video-games discussed here have the potential to increase bodily capacities, they are are limited by issues such as the structuring of user-generated content, industry commodification and disablist notions that pervade the applications. Further study in the area should focus on the digital content produced by the disabled community in order to better understand the nuances of how they affect constructions of disability.

Chapter 1: Introduction

Research Question

The purpose of this thesis is to explore whether it is possible to represent the alternate experiences of a specific socio-cultural group of society through digital media so as to illuminate and diminish the inequalities that groups suffers from. For the purposes of this thesis, the digital experiences of the disabled community will be focused on and how their use of digital media can alter our understandings of the built environment.

Methodology

In terms of methodology I will be undertaking a qualitative analysis of specific digital applications in relation to the theories outlined in chapter 1 so as to illuminate issues of spatial inequality. Chapter 1 will outline the previous research that has been undertaken on issues of spatiality and the subjective perception and experience of the environment. Overall, affect theory will be used throughout as a framework for understanding how digital applications impact on an individual's bodily capacities; whether their ability to affect and be affected by an environment increases or decreases through their use of digital applications.   As the spatial experiences of the disabled community are focused on, I will briefly explore the field of disability studies and its main strands of thought with regard to the social constructions of disability and the disablism that results from it. Chapter 2 will examine the features of *PDPal* (2002), *EyeWriter, L.A.S.E.R Tag* and *Bing Maps* (2010) with the view to better understand how interactive applications can disrupt our normative notions of the built environment. Within chapter 3, I critically examine the videogame texts *Deus Ex: Human Revolution* (Eidos Montreal, 2011) and *Portal 2*(Valve, 2011) for the manner in which they encourage their players to find alternative (and multiple in the case of *Deus Ex*) paths through their virtual worlds. The main motivation for this thesis is to explicate how digital applications can make us more aware of the subjectivity of the built environment and to help foster more progressive understandings of spatiality and accessibility. This would lessen the disablism prevalent throughout Western society that is mostly invisible to those for whom the built environment has been designed for.

Chapter Outline

Chapter 2 outlines the critical framework that this thesis will work within. I will explore the theories of affect, disability and spatiality that I employ so as to illuminate issues of inequality that people experience in relation to the built environment. Having outlined the critical framework, I explore issues of spatial inequality with regard to location-based media and video games in chapter 3 and 4 respectively. These chapters are non-consecutive in their design; they explore issues of spatial inequality through affect theory in relation to the technological medium that is their focus (location based media in chapter 3 and video games in chapter 4). Thus, a reader could focus on one over the other as long as they have read the theory outline in chapter 2.

Chapter 3 will explore the possible ways to augment existing dominant representations of spatiality through digital media, looking specifically at applications such as *PDPal* and the *EyeWriter*, and will also explore the issues surrounding the production and circulation of their user's content. As Johanna Drucker notes (2012, p.86), digital products are rarely created whilst bearing in mind socio-cultural issues. The vast majority of digital applications represent the environment as a given, as opposed to a social construct. Marginalised groups of society, such as the disabled, have different spatial experiences than those with what society presumes to be complete able-bodiedness. The question of how exactly one maps different experiences of the spatial is difficult; Drucker cites the attempt at importing the urban imagination of Joyce's Dublin onto its digital representation in Google Maps as a 'grotesque distortion' (p.94). If the end product is grotesque as Drucker believes it would be, it would still serve as a way of outlining the extent to which the built environment is socially-constructed and the changes required for spatial equality to exist.

Chapter 4 will investigate how two video games, *Portal 2* and *Deus Ex: Human Revolution*, allow their players to experience their virtual environments from multiple perspectives. *Portal 2* asks the player to alter how they progress through a physical environment with the creation of two spatial portals. In *Deus Ex*, the specific combination of bodily augmentations that the player has bought facilitates different gameplay styles. How one navigates the environments in these games is multifaceted, highlighting to players how real world environments are also socially constructed and can be designed and altered to be more inclusive.

The concluding chapter of this thesis will sum up the findings from the previous two chapters so as to concisely state to what extent it is possible to represent a socio-cultural issue such as disability in digital media. It will point out some of the difficulties and limitations encountered in this study and how further research could build on the results presented here.

Chapter 2: Critical Framework

This thesis will employ affect theory to examine the role of contemporary technologies in constructions of disability and the various ways in which people can resist those constructions. Affect theory is used due to its focus on how the body can have varying levels of capacities depending on the socio-cultural group one occupies; this viewpoint has a natural affinity with disability studies, where lower levels of bodily capabilities and accessibility are literally what defines the communities' existence. Clough (2007) refers to affect as

> "bodily capacities to affect and be affected or the augmentation or diminution of a body's capacity to act, to engage and to connect" (p.2).

In other words, affect is a framework for gauging the consequences socio-cultural processes have on an individual's position in society, their ability to be an autonomous individual in their societies' affective flow. Seigworth & Gregg discuss how affect can be thought of 'as a gradient of bodily capacity' (2010, p.3) wherein a person's agency rises and falls depending on the various forces that affect them. Clough further discusses how new technologies are 'allowing us both to see 'affect' and to produce affective bodily capacities beyond the body's organic-physiological constraints' (p.3). Throughout this thesis I will argue for digital environments as such technologies, ones that disabled people can use to alter their belonging to the various affective forces they encounter in the built environment.

In their discussion of affect, Seigworth & Gregg (p.3) observe that the body is perpetually becoming, we will never know what the body can fully do as the world of affective forces is constantly changing. Watkins (2010, p.267) discusses this notion of becoming in relation to how affect may be accumulated over time; while the initial impact of an affect may be fleeting, it leaves a residue on the body, a lasting impression that partially determines our bodily capacities (ibid, p.269). This thesis will examine how digital media allows people to both accumulate new affects and lessen adverse ones which limit our bodily capabilities. The focus of this research will be on those who deviate from traditional notions of able bodiedness within their use of digital technology and how they can alter the affective flow to allow for more diverse understandings of bodily capacities.

Probyn (2010, p.84) discusses concentration camp narratives and their associated shame as an example of how certain affects can belong more closely to particular people than others. He elaborates on how we can over-identify and subsequently incorporate affects into our bodies, 'altering our understanding of ourselves and our relation to the past,' disturbing our 'relations of proximity' (p.86). Thus, ideas and writing about affect change how we relate to other bodies and their differing capacities, often affecting us to the point of incorporating that affect into our own bodies. Probyn references LaCapra's concern of over identifying with the affects of other bodies (ibid), causing our own to be significantly affected to the point of being irreversible. While Probyn sees this as a concern, it raises the possibility of creating more inclusive and progressive understandings of alternate bodily capacities. If users of digital media were to virtually act out experiences of disability, or indeed any social-cultural issue, and to experience how the built environment affects the bodily capacities of minorities, would this not have the potential to encourage more inclusive and progressive understandings? Throughout this thesis, I will explore the use of digital media as a method of sharing multiple affective experiences of the environment, one which could let us incorporate the affects, the experiences, of another body into our own.

I will explore issues of disability from the perspective that it is a social construction as opposed to an inherent flaw of an individual's biological body. Within disabilities studies, these two different viewpoints are often referred to as the social and medical models of disability. The medical model of disability views the difficulties a disabled person encounters in their daily lives, their limited bodily capacities, as solely deriving from the biological condition that they are suffering from. The social model of disability, however, establishes a distinction between what Western medical practices view as bodily abnormalities and the socio-cultural discrimination that people whose bodies differ from the supposed norm suffer from. Goggin and Newell (2003, p.21) refer to these as 'impairment' and 'disability' respectively, whereby impairment is the biological condition of a person's body and disability is a discriminatory practise that society constructs. Mowl and Fuller (2001, p.165) refer to this discriminatory practise as disablism and define it as

'assumptions made about another individuals behaviour, capabilities and
interests purely on the basis of a visible impairment. At a broader societal level,

disablism describes the socio-political processes that marginalise and oppress disabled people'

Thus, when I refer to disabled people in this thesis I do so working from the viewpoint that their disability is not solely an inherent flaw in their physical bodies or a deviance that they produce themselves, but something that society creates due to its discriminatory practise; as a socio-political group, 'disabled people' would not even exist if not for the discrimination they face. Even with its socially constructed nature acknowledged, further difficulties are encountered within disability studies when using the term 'disabled people' due to the wide spectrum it encompasses and the specificities it subsequently ignores; the difficulties a paraplegic encounters are far different than that of a deaf person and thus should not be lumped together under the category of disabled people. Chapter 2, however, will encounter this difficultly; despite arguing for the potential of location based digital media as a tool for reflecting the varying individual experiences of the built environment, I use the category of disabled people as a necessary evil for the purposes of conciseness. While the specific bodily capacitates can vary enormously within one socio-cultural group, the disabled community in particular, it is within the scope of this thesis to account for all those experiences.

The disability rights motto 'nothing about us without us' raises the question of who can theorise about specific bodily capacities and who cannot. Mowl and Fuller argue that no one is without some type of impairment when one considers 'conditions such as short-sightedness, asthma, hay fever, premature baldness and obesity.' While these conditions vary greatly, the point is that none of us are likely to live out our lives without encountering some type of impairment or disability, be it temporary or permanent. As Chouinard (1999, pg.149) notes, tension exists over who has membership of the disability community and who can advocate for it.

> 'Over the years, disabled women's experiences of being subjects of academic research – of being sources of data which help to advance academic careers and expert knowledge of disability issues – has contributed to feelings of exploitation by and alienation from the academic research community'

It is important for minority groups of society to feel empowered by research and not exploited by it. In chapter 1, I propose the use of digital media by disabled people, for

disabled people, whereby they express their own personal experience of being disabled by the built environment through the use of digital media.

Just as I explore disability as socially constructed, technology is also never created without embodying the socio-cultural conditions that surround its production. Judy Wacjman, cited by Goggin & Newell (2003, p.3), states that

> 'technology is always a form of social knowledge, practises and products. It is the result of conflicts and compromises, the outcomes of which depend primarily on the distribution of power and resources between different groups in society.'

Thus, not all technology serves the interests of all or indeed is even usable by an entire population. If a user of a particular piece of technology does not fit the model of normalcy that the designers worked within, then they become disabled by that very technology. A widespread example of this would be the prevalence of the visual interface in contemporary technologies; whether it be smartphones, tablets or laptops, the visual screen is a dominant feature. For those who are hard of seeing or blind, this privileging of the visual screen by Western society disables them, lowering their bodily capacities (their ability) to affect changes in their own societies.

Technologies such as screen readers have been developed for those without access to visual interfaces and are often seen as progressive, as signs that technology is taking into account those less fortunate. These are, however, only ad-hoc interfaces; the problem here is one of technological determinism; we are creating technology to solve problems that technology caused in the first place, rather than creating technologies that are accessible to all, ones that have universal design. Mace (1998, n.p.), when discussing universal design, states that its 'focus is not specifically on people with disabilities, but all *people*'; technology should not be designed so as to exclude certain socio-cultural groups. Unfortunately, universal design is rarely acknowledged by designers and technologies continue to be designed that prevent certain people from accessing them. This thesis focuses on how space is represented in digital applications and how those who are disabled by both the built environment and digital representations of it can create and express alternate understandings of spatiality using digital media.

In his discussion of the dérive concept, Debord (1956, n.p.) quotes Chombart de Lauwe when he states

> 'an urban neighborhood is determined not only by geographical and economic factors, but also by the image that its inhabitants and those of other neighborhoods have of it.'

The dérive is a concept that I will return to more fully in chapter 3, but for now it is sufficient that it shows how our experience of the environment around is affected by our own disposition; Drucker (p.90) notes this in relation to *Google Maps'* singular representation of the world when she states '[i]f I am anxious, spatial and temporal dimensions are distinctly different than when I am not.' Thus, a static representation of the world, such as Google's *Street View*, does not reflect the variety of ways we perceive what is around us. Denis Wood (2010, p.111) discusses how the emerging practise of counter-mapping can be used as a potential tool for resistance against dominant norms and expressing our subjective experiences of the world;

> 'While the hype focuses our attention on the new technologies with their satellites, their gazillion miles of optical fiber, their computer hardware, and their miraculous software (that is, on their extraordinary capitalization), it's the new attitudes, visions, and radical philosophies of the counter-mappers that are really taking maps and mapmaking in a whole new direction, a direction with the *potential* to free maps at last from the tyranny of the state.'

If the maps of the state and professional cartographers bind their citizens together in their own vision of the world, 'for the map is nothing but an assertion of the state of the world desired by its makers' (ibid, p.2) then it is also possible for the reverse to apply whereby a person's own socio-cultural experiences can be mapped, to count-map against the state's as a method of resistance. In the Mayan Atlas, the authors declare

> "Maps are power. Either you will map or you will be mapped. If you are mapped by those who desire to own or control your land and resources, their map will display their justifications for their claims, not yours"

Wood also quotes Nietschmann who stated 'More Indigenous territory has been claimed by maps than by guns. And more Indigenous territory can be reclaimed and defended by maps than by guns.' The overarching point is that maps need to be used by the individual as tool to express their own interests and desires. I will discuss this notion of counter-mapping as user-generated content in chapter 3 from a participatory culture perspective. In *Fans, Bloggers and Gamers: Exploring Participatory Culture* (2006, p.1), Henry Jenkins discusses the notion of fans as 'rouge readers' who appropriate and circulate media content in ways the original creators did not intend. Certain fans refuse to read by the rules that a media text imposes upon them and the process by which they alter the content of the text becomes 'a kind of play' (p.39). According to Jenkins, one becomes a fan when the line between consumption and production become blurred (p.41) and a fandom becomes

> 'a vehicle for marginalized sub-cultural groups (women, the young, gays, and so on) to pry open spaces for the cultural concerns within dominant representations' (p.40)

While producers of the original text often see this as copyright infringement, fans see their work as 'repairing the damage' of the text (p.47). In other words, they recognise the negative affects the original text has on their sub-culture and seek to alter their engagement with the text so that it will reflect their own sub-cultural desires. Jenkins discussion of fandom activity provides a useful framework for examining the various ways member of the disabled community can augment virtual environments.

Despite the fact that Wood does not place much credence on new technologies or their rate of improvements, they have become the pervasive in Western culture. In his book *Hertzian Tales* (2005), Anthony Dunne defines psychosocial narratives as relating to 'the unique narrative potential of electronic products' whereby the user is 'a protagonist and co-producer of narrative experience rather than a passive consumer of a product's meaning' (p.69). Dunne sees the interactivity of the technologies that Wood dismisses as having the potential to 'generate a narrative space where the understanding of the experience is changed or enlarged' (p.71) where the user challenges 'the mechanisms that legitimate the conceptual models embodied in the design of the product or system' (p.72). Dunne's view of the technology user as an active protagonist in meaning-making is similar to Jenkins' discussion of participatory culture (which I discuss below); both view

the deviant actions of the user as altering their position in the affective flow, of changing their own capacities to affect and be affected by the text. In the case of the digital map and environment applications that are examined in chapter 3, such as *PDPal* and Bing *Maps*, users have the ability to mark up the environment to reflect their own socio-cultural experience of it. I will examine the potential uses of such alternate digital map making tools with regard to disability in chapter 3.

To conclude, the overall framework of affect is used in this thesis to determine how the bodily capacitates of those with disabilities are influenced by their use of digital technologies. Disability and spatiality are viewed as social constructions and subject to change and alternate understandings, and technology is viewed as embodying the social conditions which surrounded its production. The following chapters will investigate, using the outline theories above, how our understanding and experience of the spatial can be altered through digital technologies.

Chapter 3

This chapter explores how location-based media can be utilised by members of the disabled community as a tool for resisting against the built environment and dominant understandings of accessibility, both of which contribute to limiting their bodily capacities. The applications discussed here are dependent on members of the disabled community to represent themselves; users create content themselves and share it with others so as to foster new experiences. This type of interaction works well when one considers the motto 'nothing about us without us' that is frequently used by members of the disability community; the user-generated content helps ensure that the issues affecting disabled people are made apparent. This chapter begins by briefly outlining some of the possible ways location-based media could be used to create user-generated content. It is beyond the scope of this thesis to thoroughly examine the content that has already been produced using these applications; the focus here is to investigate the issues surrounding these applications that would limit their ability to represent a socio-cultural issue such as disability. I then proceed to discusses the acting out of counter-maps by people outside of the disabled community, and finally explore the best way to structure (if at all) and provide access to the content so as to encourage its proliferation outside of the community that created it, thus ensuring it affects those with normative understandings of the built environment.

User-Generated Content as Counter-Mapping

Digital applications such as the *EyeWriter* and *PDPal* enable their users to create and publish their personalised annotations onto the built environment, creating a counter-map in the process. These applications can be described as location-based media, and are applied to the real environment so as to create interactions among people. The graffiti artist known as Tempt (who has the degenerative nerve disorder ALS) uses the *EyeWriter* to mark-up the environment despite his limited mobility. Figures 1 and 2 show how Tempt can affect a wide range of people by projecting his digital graffiti onto the side of a building, despite his bodily impairment and the lack of services made available by society that contributes to his marginalisation. Figure 4 shows how *L.A.S.E.R Tag* has a similar function; people can use a handheld laser to draw in real-time on the built environment, adding a more performative dimension to the marking-up of the environment. The 'Don't Trust Bush' marking makes people in the visual radius of the image aware of the user's

political stance on the former President of the US and cautions those who support his policies. Figure 3 shows the user interface for *PDPal* which allows its users to record and publish a text-based message, detailing their personal experience of that area, of how a specific place in a specific time affected them and their bodily capacities. These applications record the personalised annotations of their users and share them with others. While the digital resistance in the images below do not relate specifically to issues of spatiality and disability, they do show us how a disabled person might mark-up the environment so as to protest against issues of inequality, to counter-map their own experiences.

Figures 1 and 2: graffiti artist Tempt uses the *EyeWriter* to affect the urban environment despite his disability; his annotation is then projected onto the environment, affecting those within the same spatiality.
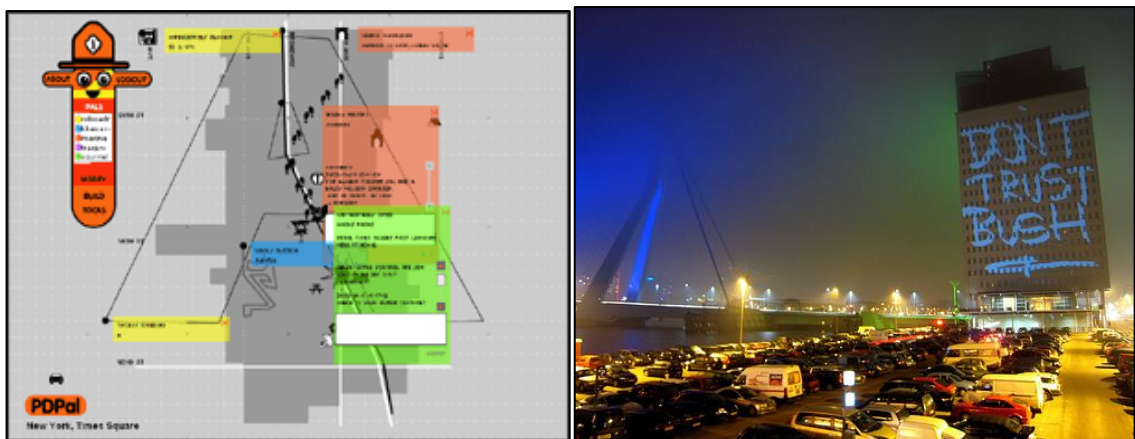
Figure 3 and 4: the *PDPal* interface shows multiple experiences of the same spatiality, while a user of *L.A.S.E.R Tag* warns onlookers not to trust former President Bush.

While Tempt and other users of these applications use them for mostly artistic purposes, it is not difficult to see how a member of the disabled community might use them to resist against features of the built environment that negatively affect them and call attention to issues of spatial inequality. Symbols of disability that are widely known by society include the white outlines of a wheelchair user, a set of hands signing and a person walking with a cane, all on a blue background, signifying that a particular space is designated for members of the disabled community. These areas are carved out of the main built environment and give the impression that society is accommodating the deviant needs of those with physical impairments, further obscuring the fact that the environment is socially constructed. Using digital media, a disabled person could use these symbols not to comply with the designated spaces that have been assigned for them as a minority group, but to place them on areas of the built environment that have been designed against them and that lower their bodily capacities. By placing the symbols on areas of the built environment that are not accessible to them, the disabled community could highlight the extent to which the built environment is constructed against them, affecting their ability to take action in their society.

This is a rudimentary yet overarching example of how the disabled community could use location-based media to highlight accessibility inequalities. By using a virtual representation of the environment, they can create what Deleuze (2004) calls a simulacrum,

> 'by simulacrum we should not understand a simple imitation but rather the act by which the very idea of a model or privileged position is challenged and overturned ' (p.82)

The digital markings of the disabled community can create a simulacrum which challenges the socially constructed environment, one which we occupy habitually and as a result cannot question as effectively. A virtual simulacrum can disrupt and defamiliarise our relationship with the environment, allowing us to see it from a different perspective. Thus, the virtual annotations produced by the disabled community could affect us into more progressive understandings of the built environment, altering how we think of bodily capacities.

Acting out Counter-Maps

The issue of what medium one uses to perceive a counter-map is important as the level of embodiment they provide the user can vary considerably. The *EyeWriter* is an example of a head-mounted display that facilitates augmented realities; people can interact with the environment in a virtual manner just as they would with smartphones that facilitate applications such as *PDPal*, however the wearable nature of a head-mounted display makes the digital media far more seamless. If a head-mounted display such as the *EyeWriter* was used to display the annotations left by members of the disabled community, it is possible the user could adopt the bodily capacities of the author of a particular counter-map and incorporate how the latter is negatively affected by the built environment into their own body. This incorporation of the affects of another community is viewed by Probyn as dangerous as it disturbs our relation of proximities (as was discussed in chapter 1). However, I argue for the use of digital media to blur the boundaries between the different affections of communities as it has the potential to make society more aware of how the manner in which a specific spatiality is constructed can limit the bodily capacities of certain socio-cultural groups in a way that the user of the application may not understand.

Janet Murray (1998) states that digital stories are potentially valuable as they provide us with a safe place with which we can confront disturbing feelings we would otherwise oppress (p.25). Murray states that a potential fault of 3D environments is the tension between the scripted story and being in a virtual environment, where those using the application would pay more attention to the latter. However, in the case of members of the disabled community marking-up the environment to reflect the issues of accessibility they experience, the markings are what constitute the story line. Those viewing the annotations placed on the environment are perceiving the story of a disabled person's life and the limited bodily capacities they experience due to the design of the built environment. While it is not in the form of a traditional narrative (such as a Shakespearean play, as Murray uses as her key example), the markings on the built environment create a narrative none-the-less, a narrative concerning issues of accessibility that can be acted out through head-mounted displays such as the *EyeWriter*. Murray acknowledges this feature of digital media when she states that traditional media only portrays a space, but digital media can *present* one (p.80).

This ability of a digital environment to present alternative and fluctuating spatialities makes it quite useful for allowing people to experience new affects. As mentioned in chapter 1, Probyn (2010) discusses the possibility of over-incorporating affects that do not originate from our own, altering 'relations of proximity' (p.86) in society. While some may see this as cause for concern, incorporating the affects of others can lead to us to better understand them and how their bodily capacities differ from our own. In the case of the disabled community, not being able to access parts of the environment that they have marked as inaccessible to them would alter our capacitates to navigate that environment, blurring the discrepancy between the marginalised and the supposed norm.

Accessing Alternative Spatiality's

A significant point of discussion that arises when discussing or using location-based media that allow the user to annotate the environment is that of organization; how does one categorise the potentially vast amount of varying socio-cultural data that people could produce and place on top of a virtual environment? This issue is often seen as a fault of location-based media; Dietz describes (2003, p.202) it as a potential 'mishmash' of information, while users of the *Urban Tapestries* project where most concerned with having the ability to navigate among the content as they wished;

> '"What will happen when we have a dense maze of threads?" wondered one
> tester. "How will we navigate them? How will we [find] interesting content?" '
> (Moed, p.107)

These questions from the users of *Urban Tapestries* are revealing in that they show us their desires for maintaining order, for allowing the user to categorise and view the data according to their own desires. While this may seem a reasonable request, I am arguing for the use of digital media to disrupt dominant notions of the built environment by showing the varying bodily capacities of different communities. Location-based media that is shared over a network such as the internet holds great potential for marginalised groups such as the disabled, but bringing about change in understandings of spatiality and accessibility is only possible if those outside of a specific socio-cultural community actually engage with the content produced by minority groups. If the user-generated content produced by the disabled community is only viewed by other disabled individuals then this will not spread alternative understandings of accessibility. Dietz recognises the

issue of how to encourage people to consider another's unique map, their experience of a specific spatiality;

'Is there a way to create a wider base of experience without becoming prescriptive, to honor the individual point of view while ending up with an overall point of view that has value for more people than just the participant?' (Dietz, p.202)

Dietz posits ratings, attributes and other criteria as empowering users of location-based applications with the ability to categorise content, however, this does not encourage users to experience the bodily capacities of others, to understand how the disabled community are negatively affected by the built environment. A system that categorises the content more indiscriminately (if at all) will encourage users to view the content that has been produced by individuals who are members of a different socio-cultural group and whose bodily capacities are considerably different to their own. Deleuze and Guttari (1987) posit the concept of the rhizome to describe how to store and access data in a multiplicitous and non-hierarchal fashion. They state that the 'rhizome has no beginning or end; it is always in the middle, between things, interbeing, intermezzo' (p.27). The rhizome privileges uncertainty and is thus a useful tool to envisage how we might encourage more insightful and cross-border access to information so as to allow the environmental annotations of minority groups to have equal representation. Deleuze and Guttari describe that the rhizome as;

'ceaselessly established connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles. A semiotic chain is more like a tuber agglomerating very diverse acts, not only linguistic, but also perceptive, mimetic, gestural, and cognitive' (p.8).

How a rhizomatic structure might be used in location-based media can be illuminated with the concept of the dérive. As was briefly discussed in chapter 1, the dérive was developed by the situationist theorist Guy Debord as a method of creating new emotions and behaviours deriving from the built environment that people inhabit. Debord defined the dérive as;

16

'[a]n experimental mode of behavior linked to the conditions of urban society: a technique for hastily passing through varied environments.'

For Debord, the overall aim of a dérive ranges from studying a particular area to emotionally disorientating oneself. Within the location-based applications that are prevalent today, the dérive can be used a tool so as to prevent people from choosing what user-generated content/counter-maps they want to see and to thus experience how other people are affected by the built environment; the annotations of marginalised community, such as the disabled, will only proliferate through other members of society if they are given an equal representation in the application. Thus, users would view another person's randomly chosen map beside their own, but within the same area that the user is occupying, as a method of gauging how that specific spatiality increases or decreases the bodily capacities of someone else in a different socio-cultural community. While Debord acknowledges the concerns over the randomness of a dérive, it is precisely the randomness of this technique that makes it akin to the rhizomatic structure that Deleuze calls for, one that works against dominant, more privileged systems of power; in this case, the dominant understandings of the built environment and the uneven accessibility it creates are resisted against by not allowing users to choose what experience of the environment they are given, thus ensuring that users can experience the bodily capacities of a disabled individual.

Commodifying Resistance

The creation of content by marginalised communities better represents their own interests and experiences; however, Jenkins (2007) expresses concern over the commodification of the content, causing it to become removed from the socio-cultural group that created it. While discussing fanfiction, Jenkins points out that there is commercial interest in turning the content produced by fans into something commodifiable and that this is a considerable cause for concern;

> 'These stories are a labor of love; they operate in a gift economy and are given
> freely to other fans who share their passion for these characters. Being free of
> the commercial constraints that surround the source texts, they gain new
> freedom to explore themes or experiment with structures and styles that could
> not be part of the "mainstream" versions of these worlds.' (n.p.)

While the counter-mapping annotations that are used in the spatial applications discussed earlier may not have as much of a commodifiable opportunity as fan culture, the commodification of the former would still result in an isolation of it from the community that created it, lowering the ability of the content to reduce the negative affections from which the community suffers. If a mainstream commercial application such as *Bing Maps* were to provide equal representation for marginalised groups in their mapping efforts, it would require the industry to either research the nuances of the sub-cultural community and work with them to create more progressive spatial representations or allow the latter to represent themselves in their application without regulating their content. Jenkins summarises this difficulty when he states;

> "You can't serve a community if you don't understand their existing practices and their long-standing traditions."

Thus, while it may be a step forward for the industry in terms of more equal representations of spatiality, the very presence of commercial interests can disrupt the idiosyncrasies of the minority group (whether it be fans or the disabled) and the content they produce so as to widen their range of bodily capacities.

An example of where the industry could play a bigger role in the production of an alternative representation of spatiality is the *Bing Maps Photosynth* project, which encourages its users to upload their own photos to create a global gallery of a particular object. Unfortunately, the vast majority of photos that gain representation in a *Bing Maps* demonstration at TED (Microsoft, 2007) created a homogeneous representation that failed to show how the design of the building affects people in diverse ways. The demonstrator uses the example of a cathedral to show how a 3D representation of the object can be created from the digital data that users upload. Given how the disabled community are a minority, any spatial annotations they do make of a specific place would most likely be drowned in the sea of data. However, it would be far more progressive and interesting if the 3D object was misshaped and malleable, if it contained the personal experiences of different socio-cultural groups and reflected the fact that it is experienced in different way for different people. In the case of the disabled community, the 3D model that *Bing Maps* create could have missing elements if those elements are not accessible to disabled people due to design flaws that prevent equal access. *Bing Maps*, which is owned by Microsoft, could alter the program so as to place the data of the marginalised at the forefront,

highlighting to the majority of its users that the accessibility of the spaces they have occupied and taken a photograph varies greatly due to its design.

Conclusion

While the production of annotations such as vocal recordings, images and video highlight the ability of marginalised groups such as the disabled to create counter-maps that better represent their experiences of the environment, how this content is subsequently represented and consumed by others through digital media is problematic. Application such as *PDPal* and *EyeWriter* increase the bodily capacities of the disabled community by enabling them to create and publicise their limited experiences of spatiality, offering them the opportunity to highlight the disabling affect of the built environment and its subjective nature. However, issues such as the manner in which these counter-maps are acted out, the way in which the data is stored and accessed, and the appropriation of the counter-maps into commercial products signify the difficulties marginalised communities face in achieving equal representation by way of location-based digital media.

<center>**Chapter 4**</center>

While the location-based applications discussed in chapter 2 depended heavily on user-generated content to create meaningful interaction, the video game texts discussed here provide their players with a pre-defined set of interactions with which they can engage their virtual environments. As a result, the alternative understandings that players can create are limited by the design of the games and the assumptions the latter make concerning issues of accessibility and how bodily capacities are determined. *Deus Ex* and *Portal 2* are similar in that they portray the corporeal body as being affected by the environment but also capable of affecting it back, of taking action against its normative assumptions. However, the games differ when determining the most appropriate way to allow the player to resist these norms; whether bodily or spatial augmentations should be used to diversify our bodily capacities. This chapter will explore both video game texts in relation to issues of accessibility so as to explicate how they comment on our bodily capacities in relation to the environment.

Deus Ex and Bodily Augmentations

The body and spatial politics of *Deus Ex: Human Revolution* are intertwined between the game's scripted narrative and its core mechanics. In *Deus Ex*, the bodies of the world's population are heavily augmented with technology. So as to prevent the biological body from rejecting the technological augmentations, the drug neuropozyne must be bought and consumed at regular intervals. The player takes on the role of Adam Jensen, the head of security for one of the world's largest biotechnology firms, Sarif Industries. In order to stop the firm from releasing new technology that would remove the need for neuropozyne, thus allowing more equal access to augmentations for the world's population, a powerful minority attack Sarif Industries and abduct their key scientists. The attack leaves Jensen near dead but he is saved, against his will, by becoming heavily augmented with Sarif technologies. The overall aim of the game is to track down the missing scientists and find out who was responsible for the attack. On first inspection, it would appear that *Deus Ex*'s narrative utilises disability so as to explore issues of technological embodiment; however, the narrative continuously revels in the issues of uneven bodily capacities that technology has created, of the varying level of able-bodiedness among the game's characters and how one experiences the world of *Deus Ex* varies greatly due to the social and political issues that surround technology. Mitchell and

<center>20</center>

Snyder discuss how certain narratives, particularly postmodern ones, wallow in the materiality of deviance (146), of an issue such as disability, rather than simply using it as a metaphor that initiates a narrative. I argue that within *Deus Ex* issues of bodily capacities and disability are at the forefront but that these issues and their possible solutions are acted out on the body rather than the environment.

The most apparent point on issues of disability is the game's widespread depiction of bodily prosthetics, or 'augmentations' as they are called in-game. While they are developed only for those with disabilities in our contemporary society, they are heavily commercialised, fetishized and militarised in the world of *Deus Ex*, to the point where one's position in society is expressed through the visible combinations of ones augmentations, that is to say the extent of their bodily capacities. Figures 2, 3 and 4 depict this fixation the world of *Deus Ex* has developed for explicitly altering bodily capacities. When one looks upon it in this manner, it is not difficult to see parallels with Western culture; those with low bodily capacities such as the disabled are often seen not as victims of oppressive social constructions, what was established as disablism in chapter 2, but as causing the problem themselves due to their own bodily deviance, what Goggin and Newell call impairment (p.21). In the world of *Deus Ex*, those with low bodily capacities are seen not as victims of strict class structures but as undesirable as they cannot afford augmentations or the necessary drugs to maintain them, thus lowering what Clough (2007) describes as their ability 'to act, to engage and to connect' (p.2) in their society. While it may seem that this form of disability is a metaphor in the world of *Deus Ex* for the disability that we are familiar with, it is in fact being shown with a social and political dimension to it; disability is something that is born out of financial disparities among the world's population in *Deus Ex* that is subsequently written onto an individual's body through their augmentations, highlighting the fact that disability is a social construct, something that is out of the control of the individual and that there are socio-political forces that act on the body and affect a person's bodily capacities. Those without augmentations or those addicted to neuropozyne are the disabled of the *Deus Ex* world as society has limited their ability to take action within their world and aren't used as a mere narrative device to initiate the main storyline, they and their bodily capacities and who really controls the flow of affect are central to the narrative.

Overall, the game's portrayal of the body maintains the viewpoint that a person's bodily capacities are centred on and determined by their own corporeal body and not how the built environment affects them. The player is given the ability, and is actively encouraged, to augment Jensen's body with biotechnology so as to proceed through the game. While this feature of the game propagates the disableist viewpoint that disability is an issue arising from the deviant body rather than from discriminatory practises of society, it does reflect current Western medical trends which are attempting to 'cure' deviant communities such as the deaf, the blind and amputees. Figures 9, 10 and 11 show recent augmentations developed by Western science which conform to the medical model of disability where the individual body must be augmented and not the built environment. One cannot overly fault the game designers for reflecting upon our contemporary efforts into bionics when the world of *Deus Ex* is that of Earth in the year 2027. Figures 6, 7 and 8 are in-game advertisements for augmentations and are clearly inspired by the type of augmentations seen in figures 9, 10 and 11. The breath of mechanical augmentations available to the player is staggering and can be seen in Figure 5, below; players can purchase limbs that can break through walls, lungs that facilitate chemical resistance and EMP Shielding that allows them to travel through areas of malfunctioning electronics. However, as discussed in chapter 2, it is not the bodies of the individual that has to be altered for spatial equality to exist but the built environment.

Figure 5; Deus Ex's augmentation menu. Augmentations are available for social enhancement, hacking and Hyper-Oxygenation.
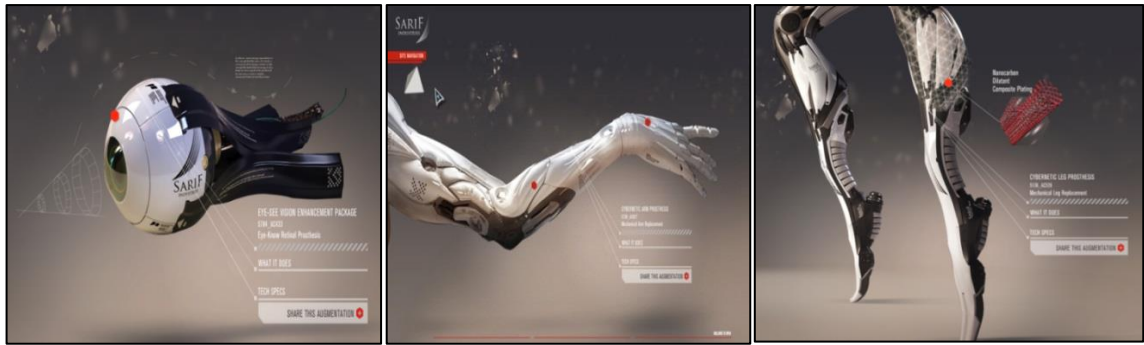
Figures 6, 7, & 8; these promotional posters for the game are in-game advertisements from Sarif Industries, and show the commercialisation of augmenting bodily capacities.

Figures 9, 10 &11; the mechanical augmentations chosen by the designers of *Deus Ex* are clearly based on contemporary efforts into altering our bodily capacities.

While *Deus Ex*'s multiple ways of augmenting the physical body are troublesome, it does allow the player to affect its physical (and virtual) environment in multiple ways, illuminating its socially constructed and subjective nature. There are four main methods of progressing through *Deus Ex*'s environments, all of which can be combined to a specific degree depending on the style of interaction that the player wants. The four main methods are hacking, combat, social interactions and environmental stealth. The player's ability to use each method depends heavily on the specific combination of augmentations that the player has bought. The social method involves using your augmentations to manipulate another person by gauging their emotional state and secreting chemical pheromones to manipulate them into being more accommodating of your needs. The hack method involves using augmentations to break into security terminals, granting you access to locked areas and technologies which can be turned against enemies. The combat method involves using offensive augmentations for direct physical assault on enemies, while the environmental stealth method and its augmentations allow you to use specific features of the surrounding environment so as to avoid detection from enemies. While

these bodily augmentations do allow the player to explore the socially constructed environment in multiple ways, they perpetuate the disablist view that it is the body that must be cured and not the discriminatory design of the built environment for spatial equality to be achieved.

While issues of uneven bodily capacities are found through the game, there is one point in the game where issues of disability are outright used as a tool for the narrative and dealt with in a conventional and disableist manner and that is with the character of Hugh Darrow. Darrow is viewed as the father of augmentation in the world of *Dues Ex*, however, what is considerably noteworthy about Darrow is the fact that he is the only main character in the game that is disabled; his right leg is bound within a metal brace and he requires a crutch to walk. Darrow does not possess the genes necessary that facilitates the combination of human flesh and mechanical augmentations; thus, he cannot use the very technology he created himself to remove his physical impairment. Given how technology has been used in the world of Deus Ex to augment deviant bodies into normative ones and not used to alter the socially-constructed environment, those who cannot accept augmentations, such as Darrow, and those who cannot afford the process , such as the neuropozyne addicts, have much more intense disabilities when one considers the vastly increased bodily capacitates of those with augmentations when compared to the bodily capacities of our contemporary society; Darrow's disability has only been exacerbated by his technology.

Mitchell and Snyder (2000) discuss how it is has been important for plots to 'emphasise individual isolation as the overriding component of a disabled life' and that disabled characters were either 'extolled or defeated according to their ability to adjust to or overcome their tragic situation' (p.19). As discussed previously, *Deus Ex* does successfully portrays issues of spatial inequality, however, the only disabled person as we in the C21st Western world would recognize as disabled, Hugh Darrow, is portrayed as bitter and resentful. Darrow is part of the elite minority who call themselves the Illuminati and who control the flow of technology. While his interests aligned with the others at first, his dissatisfaction with the uses of augmentations led him to betray the group and show the world the extent to which those with augmentations can be controlled. The group created a biochip which would control mechanically augmented and planned to use it to stratify their corporate needs. Darrow betrays the Illuminati, however, and uses the

biochip to drive people insane and ferocious and displays this during a live broadcast. When confronted by the player he tells us;

> 'When this is done, the Illuminati won't be able to control men and women like you, as they had planned, from the inside out. No one will be able to use the technology I invented to make others into beings they desire…I created something magnificent [mechanical augmentations] and watched it turned to ashes. And the lesson I learned from my suffering is exactly the lesson that is in play here'

Darrow's methods are undoubtedly horrifying, as all those who have been augmented are driven insane and attack those around them. However, in doing so Darrow has revealed to the world that their bodily augmentations ultimately destroy their bodily capacities as it takes away their free will and places it in the hands of the corporations that have developed it. In order to convince Darrow to give the player the code that can shut off the signal to the biochips, the player must convince him that while his goal is moral, his means are not. The most effective way of doing this, however, is to use Darrow's disability against him and claim it is the sole reason for his publicising the dangers of augmentations. When accused that his methods are akin to genocide, Darrow points out that he created people like Jensen, revealing his feelings of accountability for the misuses of mechanical augmentations. He admits that '[i]f fate had dealt me a different hand, then perhaps…perhaps neither of us would be here.' Darrow is likely referring to his disability and how it was a motivational force in his creation of augmentations. How this moment plays out reveals the most distinct example of disablism in the game in the game; Darrow is made to feel that it is his crippled leg and his inability to augment his body that are the reasons behind his revealing the dangers of the new biochip to the world and not misplaced feelings of moral obligation. In order to win the dialogue battle with Darrow and deactivate the signal to the biochips, Jensen states that 'it's the kind of irony that could tear you up inside…until you find yourself despising what you're not,' referring to the fact that Darrow cannot use his own technologies to increase his bodily capacities.

While *Deus* Ex successfully portrayed the socially constructed nature of the environment, it fails to adequately portray the nuances of a disabled person and their bodily capacities. The marginalization that members of the disabled community such as Darrow experience is what motivates them to create change in society, not their physical impairments alone,

if at all. Darrow does not hack the augmentations because of his physical impairment but because his society marginalised him, through what Mowl and Fuller call disablism; had his society augmented the built environment to be more accommodating of the possible range of bodily capacities, and not widened the uneven distribution by attempting to cure the bodies of the disabled, Darrow would not have been marginalised and felt the need to use violence so as to achieve spatial equality. By the game's end, however, Darrow's individual isolation has been linked with his impairment and he must be overcome by the player for the narrative to progress, a typical use of disability in narrative, what Mitchell and Snyder refer to as narrative prosthesis. While the player can agree with Darrow's overall viewpoint regarding augmentations at the games end, it is significant that Darrow must be punished and overcome in order for the game to progress at all; Darrow could have simply released the information just as the player later has the option to, however, the game suggests that it is the isolation his impairment produced, and not the disablism of society, that caused him to become bitter, desiring to punish those who had a much wider range of bodily capacities than he did.

Portal 2 and Spatial Augmentations

As was the case with *Deus Ex*, the issues of spatiality and technology that I examine in *Portal 2* are intertwined between the game's mechanics and its scripted narrative. The game takes place in the Enrichment Centre, an advanced facility run by the Aperture Science research corporation. The main research of the facility is in portal technology, whereby the user of a portal gun creates two linked portals that bend physical space but maintain light and gravity, allowing the user to traverse great distances with only a few steps. The player takes on the character of Chell, a mute test subject in the Enrichment Centre. The events of the original Portal game are not necessary in order to understand the sequel's narrative (although the original storyline is available to the player as it is recorded in murals for by Doug Rattmann); Chell was a test subject for Aperture Science, running through spatial tests that GLaDOS assigned her. Having completed all the assigned tests, GLaDOS attempts to kill Chell, however, her plan fails and Chell tracks GLaDOS down so as to deactivate her. When the player successfully defeats GLaDOS, Chell can be seen lying unconscious outside the entrance to the Enrichment Centre; however, one of the Aperture's machines drags her back inside. In *Portal* 2, Chell is awoken from stasis when the facility's backup power has begun to malfunction. It is

unclear how much time has passed; the malfunctioning computer suggests "9. 9. 9. 9. 9. pause 9. 9" years have passed, although fans speculate that as the Centre is nuclear powered, it can only be 40-60 years maximum. Chell, along with an artificial intelligence called Wheatley, accidently awaken GLaDOS who resumes her spatial experiments on Chell almost immediately.

Whereas *Deus Ex* place significant importance on augmenting the physical body so as to gain a greater variety of bodily capacities, the emphasis in *Portal 2* is on altering the physical environment that surrounds the player so as to alleviate negative affections. There are two main augmentations that Chell uses to negotiate the various environments that GLaDOS tests her with, both of which can be seen in figure 12. The first is the portal gun, which is capable of firing and maintaining two portals at once, and the second is the long fall boots, which allow Chell to fall from great heights without experiencing damage to her legs. What is noteworthy of these two pieces of technology is their non-invasive nature; while *Deus Ex*'s exploration of spatiality was facilitated through a staggering array of mechanical augmentations that left the protagonist questioning his identity, Chell body does not serve as the site change, where problems of accessibility must be solved. In our contemporary society, much of the emphasis of research (especially medical) is placed on the supposedly deviant bodies of the disabled communities, whereby their bodies are altered so as to find a 'cure' for the problems they encounter (as Figures 5, 6 and 7 showed earlier). One of the most controversial examples of this is the cochlear implant, the surgery for which involves drilling into the patient's mastoid bone in the base of their cranium. A drawback of using a mechanical cochlear is a reduction in the number of hair cells within the cochlea, which often leads to a permanent loss in some or all of the remaining natural hearing. Members of the deaf community argue that this reinforces the opinion that deafness as a disability is caused by the deviant aspects of an individual's body and not by the disableist structures that society has built. The designs of Chell's augmentations are far more socially aware than those of Jensen's in *Deus Ex.* The formers augmentations are used to bend the physical environment around her and not the opposite way round; Chell's body is not the site of the problem, the environments which GLaDOS structures against her are and Chell uses her augmentations with the goal of creating a more accessible environment. Thus, Chell's bodily capacities, her ability to affect, is increased and made more apparent though her use of technology but the technology is not

used to alter her physical body into more homogenous understandings, as is the case with cochlear implants Western medical practises.

Figure 12; Chell's Long fall Boot and Portal Gun. Both are temporary augmentations, with the former serving as a type of protective armour.

While Chell's two bodily augmentations do increase her agency and her ability to take action in the game, the majority of the action is derived from how the player interacts with the environment and the array of interactions that it affords, many of which can be seen in figures 13 and 14. The main feature of the environment that facilitates alternate explorations are the white panels that line much of the test chambers throughout the game which serve as conductors for portals. Hard light bridges form a continuous path that will not end until it reaches a wall. Excursion tunnels crate an area of anti-gravity that allows any object inside its radius to become weightless and flow along its path. Both the bridges and tunnels can pass through portals, thus increasing the area that the player can affect with their technology. Other features of the environment include aerial faith plates, which propel the user across a certain distance and thermal discouragement beams, which are essentially lasers that activate certain devices that the player requires. Propulsion and Repulsion Gels are also a significant method of progressing through the test chambers; the former reduces the friction of objects moving across its service, thus increasing velocity and reducing the time to takes to navigate to a certain point, while the latter repels objects that touch its surface, relative to the force at which the objects hit the gel. Both of these gels are important for navigating across a problematic space when portals cannot be used.

Taken together, all of these mechanics allow for a varied exploration of spatiality that does not derive from bodily augmentations but rather environmental ones. When one finally solves the spatial problem that is in front of Chell and sets up the various features of the environment that she requires, it is noteworthy how little movement is required on Chell's part, despite the fact that she has crossed large expanses. Thompson (2011) mentions this in his discussion of *Portal 2*'s point of views; 'Chell herself is not actually good at jumping; she's good at falling, and landing.' Chell's mobility is quite limited, she can only jump a few feet off the ground, a limitation that is compounded when we consider how deep into the Enrichment Centre is built into the Earth and its vast rooms that must be navigated. Yet it is not Chell that must move great distances; it is the environment that surrounds her that she affects and which that she bends to her will so as to meet her specific bodily capacities.
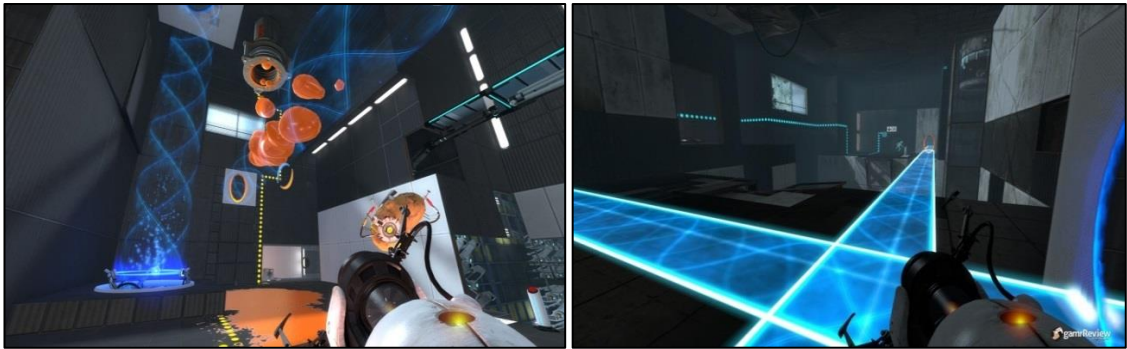

Figures 13 and 14; the player can use gels, excursion tunnels, and hard-light surfaces and more to explore and manipulate an environment from multiple perspectives.

For Thompson, one of the defining features of *Portal 2* is the importance of mobility and the multiple points of view that it allows for. It is almost a necessity to use the portals so as to avoid locating oneself in a single space for too long, the player has a far better chance of solving the spatial problem that GLaDOS has presented them with if they examine it from multiple perspectives; attempting to solve the problem from a stationary position is unwise. The ability to have multiple perspectives of spatiality is an important bodily capacity that is often underprivileged by society as the environment is not perceived as a social construct but as given, and it is therefore assumed that everyone experiences it in a similar manner as it is fixed. This is not the case, however, for members of the disabled community, who are often confined to a specific position or path in a built environment as it was constructed under the assumption that mobility is a

homogeneous experience, that we all have identical bodily capacities. As a result, disabled people must frequently work within spaces that have less utility simply because it is the only space that they access.

In *Portal 2*, this lack of mobility and the constant struggle to adapt to an environment that negatively affects you and the capacities of your body is portrayed as a maddening conflict. The sanity of both GLaDOS and Wheatley rises and falls depending on their levels of mobility. When connected to the overall facility in GLaDOS' chamber, both she and Wheatley (the latter eventually takes control of the facility with the help of the player) are driven mad with the simultaneous feelings of bodily immobility and omnipresence that the position affords them. The contradictory nature of this position can be seen by their need to have test subjects such as Chell who can actually traverse through the environment and can experience the varying types of actions that it allows, to test their bodily capacities in a specific spatiality. Confined to the chamber but connected and in control of the majority of the facility, both GLaDOS and Wheatley lose sight of the individual; thinking on a mass scale, just as an architect or urban planner would when designing a built environment, their consideration for the varying capacities of an individual is limited.
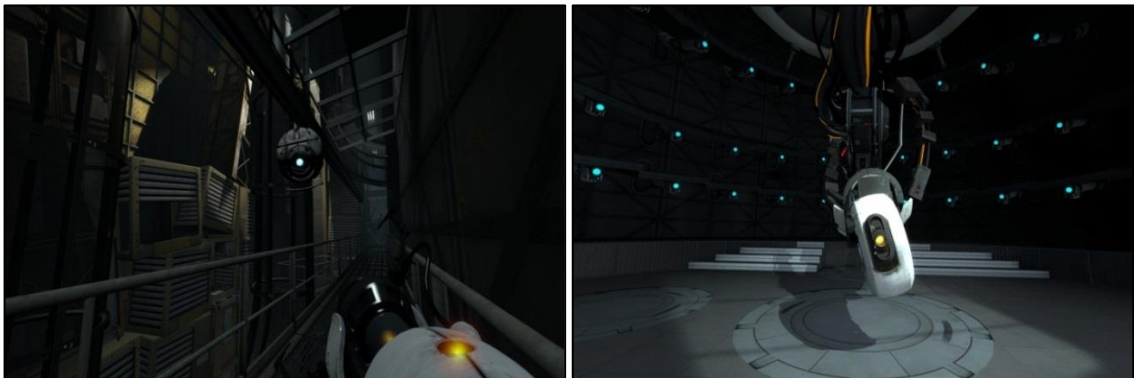
Figures 15 and 16; Wheatley is stuck on his track but has some level of mobility. GLaDOS, however, is permanently confined to the main chamber.

Thompson discusses this in relation to the marked change of character that Wheatley undergoes.

'Compare this to the initially humble Wheatley, who is mobile though on tracks…His downfall at the core transfer can be understood as not just the effects

of power upon the weak-minded, but of the loss of mobility and all its inherent vulnerability. Wheatley becomes massive, meaning everywhere…his sensors arrayed and screens cued to spread his vision over all of Aperture…'

Wheatley is driven paranoid by his inability to traverse and while he occupies the central chamber, GLaDOS has been reduced to a computer that can run on a potato battery and accompanies the player by attaching to the portal gun. GlaDOS experiences the environment and multiple perspectives by actually traversing it as opposed to simply designing it from her chamber, regaining her sanity and compassion in the process.

Conclusion; Bodily vs. Spatial Augmentations

In conclusion, both *Portal 2* and *Deus Ex: Human Revolution* propose alternate understandings of the environment that disrupt our notions of spatiality and accessibility, however they achieve this in two different manners regarding our bodily capacities and issues of disability.

The writers of *Deus Ex* chose to disrupt our notions of spatiality through bodily augmentations; spatial equality is achieved by augmenting the corporeal body and not the built environment. This proves troublesome as it conforms to the medical model of disability whereby it is assumed that it is solely the deviant bodies of the disabled community that must adapt so as to achieve spatial equality. While *Deus Ex* does achieve spatial equality by augmenting the body, this is a technologically deterministic viewpoint whereby technology is being used to solve problems that it created itself in the first place (the socially constructed environment). This can even be seen within the game's narrative itself, with the neuropozyne addicts and the lower class becoming the disabled of the *Deus* Ex world as they cannot afford the mechanical augmentations necessary to navigate the environment, to take action and affect those around them.

Portal 2, however, augments the environment as opposed to the body so as to increase our potential bodily capacities. Chell employs scientific technology such as portals, gels and lasers so as to explore alternative relationships to spatiality. The socially constructed nature of the environment is highlighted throughout *Portal 2* by portraying it as malleable, constantly changing and providing new accessibility challenges for Chell to resist against. Thus, while both games highlight the subjective and changeable nature of

the built environment, *Portal 2* does not place the onus for change on the disabled body but the disabling environment, signifying to its players that disability is something constructed and open to progressive reconstructions such as the ones they have been creating throughout *Portal 2*.

Chapter 5: Conclusion

The goal of this research was to determine whether it is possible to represent the alternative experiences of a specific socio-cultural group of society through digital media so as to illuminate and diminish the inequalities that groups suffers from. This research has found that it is indeed possible to represent the experiences of a group such as the disabled community in digital media; applications such as *PDPal*, the *EyeWriter* and *Bing Maps* demonstrate that members of a minority community can use digital media to create content that resists dominant understandings, in this case normative assumptions of spatiality and accessibility. Chapter 4 also revealed that it is possible for video games with scripted narratives and mechanics to reveal how the environment is subjectively created and affects our ability to take action within it.

However, the main contribution of this thesis to the field is its discussion of the paratextual issues surrounding digital applications and how they influence the ability of those digital mediums to affect issues of spatial inequality. While location-based media and video games have the potential to enable the disabled community to affect normative notions of the built environment, it is important that those designing these digital mediums learn from the content produced by the disabled community so as to not create technologies that reinforce disablist notions of the body and spatiality. The user-generated content discussed in chapter 3 and the gameplay in chapter 4 can affect people into more progressive understandings of accessibility, however, issues such as the categorisation of user-generated content and disablist notions in video game limit a person's ability to use these mediums to affect the disablism they experience. Thus, while it is possible to experiment with issues such as accessibility in digital applications, it is also quite possible that those same mediums will limit the ability of their users to resist discriminatory practises.

Limitations/Further Research

There are a number of areas where further research could take different approaches to studying the representation of spatiality than the one adopted by this thesis. Chapters 3 and 4 did not perform in-depth examinations of user-generated content and gameplay sessions. This was due to such an examination being beyond the scope of this thesis, however, such an examination could reveal new and unexpected techniques that members

of the disabled community are employing through digital media so as to re-form the manner in which the built environment affects their bodily capacities. A better understanding of the content's nuances could lead to changes in its circulation and its relationship with the industry; improvements to the latter are particularly important as members of the disabled community have suffered continually from misrepresentation in the past. It could also help determine the extent to which these digital applications increase awareness of the socially constructed nature of the environment in those whose bodily capacities are not limited by its design.

Bibliography

(2011), *Figure 13* [ONLINE]. Available at: <http://www.pcgames.de/Portal-2-PC-213930/> Last Accessed 28/02/13.

Abrams, J and Hall, P. (2006). *Else/Where : mapping new cartographies of networks and territories*. Minneapolis, MN: University of Minnesota Design Institute.

Adams, D., (2012), *Figure 11* [ONLINE]. Available at: http://www.bitrebels.com/design/social-media-saves-the-day-with-a-terminator-leg/ Last Accessed 28/02/13.

Bleecker, J., Zurkow, M., Paterson, S. 2002. *PDPal*. Computer Program.

Chapman, A., (2003), Figure 3 [ONLINE]. Available at: <http://www.adamchapmanart.com/network/pdpal.html> Last Accessed   28/02/2013.

Chouinard, V.. (1999). Life at the Margins: disabled women's explorations of ableist spaces. In: Teather, E.K. *Embodied Geographies : spaces, bodies and rites of passage* . London: Routledge. p143-155.

Clough, P.T.. (2007). Introduction. In: Clough, P.T. and Halley, J. *The Affective Turn*. Durham and London: Duke University Press. p1-33.

Debord, G.. (1958). *Theory of the Dérive.* Available: http://www.cddc.vt.edu/sionline/si/theory.html Last accessed 01/02/2013.

Deleuze, G (2004). *Difference and Repetition*. New York: Continuum Publishing.

Deleuze, G and Guattari, F. (1987). *A Thousand Plateaus*. New York: Continuum Publishing.

Dietz, S. (2006). Mapping the Homunculus. In: Abrams, J and Hall, P. Else/Where: Mapping — New Cartographies of Networks and Territories. Minnesota: University of Minnesota.

Drucker, J.. (2012). Humanistic Theory and Digital Scholarship. In: Gold, M.K. *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press. p85-95.

Eidos Montreal, (2011), Figure 6 [ONLINE]. Available at: <http://tinyurl.com/cqcmsg7> Last Accessed 28/02/2013.

Eidos Montreal, (2011), Figure 7 [ONLINE]. Available at: <http://img.wallpaperstock.net:81/deus-ex%3a-human-revolution-wallpapers_30969_1280x1024.jpg> Last Accessed 28/02/2013.

Eidos Montreal, (2011), Figure 8 [ONLINE]. Available at: <http://images3.wikia.nocookie.net/__cb20110116164848/deusex/en/images/thumb/2/24/CyberneticLegProsthesis.png/623px-CyberneticLegProsthesis.png> Last Accessed 28/02/2013.

Eidos Montreal, 2011. *Deus Ex: Human Revolution.* Video game. Montreal, Canada.

GangsteR05, (2011), *Figure 14* [ONLINE]. Available at: <http://www.half-life.hu/content/2011/04/05/Portal_2_Kepcsokor> Last Accessed 28/02/13.

Ges, (2012), Figure 5 [ONLINE]. Available at: < http://tinyurl.com/ct8698j > Last Accessed 28/02/2013.

Goggin, G. and Newell, C. (2003). *Digital Disability*. Maryland: Rowman & Littlefield Publishers.

Jenkins, H. (2006). *Fans, Bloggers and Gamers; Exploring Participatory Culture*. New York; London: New York University Press.

Klow, (2011), *Figure 12* [ONLINE]. Available at: <http://sectorw.wikia.com/wiki/File:Long_fall_boot_post-fall.jpg> Last Accessed 28/02/13.

Lieberman, Z., Roth, E. Powderly, J., Watson, T and Sugrue, C. *EyeWriter*. Head-mounted display.

Mace, R.L.. (1998). *A Perspective on Universal Design.* Available: <http://tinyurl.com/bwg5z45> Last accessed 03/02/2013

Menon, P., (2012), *Figure 10* [ONLINE]. Available at: <http://assets.nydailynews.com/polopoly_fs/1.1197998.1352301377!/img/httpImage/image.jpg_gen/derivatives/landscape_635/article-bionic3-1107.jpg> Last Accessed 28/02/13.

Micorsoft, 2010. *Bing Maps*. Version 7. Web map.

Microsoft, 2007. *Blaise Aguera y Arcas: Photosynth demo.* Online video. <https://www.youtube.com/watch?v=s-DqZ8jAmv0> Last accessed10/02/2013

Mitchell, D.T. and Snyder, S.L. (2000). *Narrative Prosthesis: Disability and the Dependencies of Discourse*. Michigan.: University of Michigan.

Moed, A. (2006). Conversations with Maps. In: Abrams, J and Hall, P. Else/Where: Mapping — New Cartographies of Networks and Territories. Minnesota: University of Minnesota.

Mowl, G. and Fuller, D.. (2001). Geographies of Disability. In: Pain, R. *Introducing Social Geographies*. London: Hodder Education. p.164-186.

Murray, J (1998). Hamlet on the Holodeck: The Future of Narrative in Cyberspace. New York: The Free Press.

Proboscis, 2004. *Urban Tapestries*. Digital map. Clerkenwell, London.

Probyn, E.. (2010). Writing Shame. In: Gregg, M. and Seigworth, G.J. *The Affect Theory Reader*. Durham and London: Duke University Press. p71-90.

ps3sesang, (2011), *Figure15* [ONLINE]. Available at: <http://videogamerx.gamedonga.co.kr/news_user_gamenews/1601301#!prettyPhoto> Last Accessed 28/02/2013.

Sanatate, (2012), Figure 9 [ONLINE]. Available at:

    <http://timpolis.ro/articol-ochiul-bionic-la-un-pas-de-a-deveni-realitate-23230.html>
Last Accessed 28/02/013.

Seigworth, G.J. and Gregg, M.. (2010). An Inventory of Shimmers. In: Gregg, M. and
Seigworth, G.J. *The Affect Theory Reader*. Durham and London: Duke University
Press. p1-28.

Stryctnin, (2011), *Figure 16* [ONLINE]. Available at:

    <http://www.hsmagazine.net/2011/06/review-of-portal-2/portal-glados/> Last
Accessed 28/02/2013.

Thompson, T.. (2011). *Portal 2 and Point of View.* Available:

    <http://tevisthompson.com/portal-2-and-point-of-view/> Last accessed   25/02/2013.

urban_data, (2008), Figure 2 [ONLINE]. Available at:

    <http://www.flickr.com/photos/urban_data/4091608369/> Last Accessed 28/02/2013.

urban_data, (2008), Figure1 [ONLINE]. Available at:

    <http://www.flickr.com/photos/urban_data/4091608197/> Last Accessed 28/02/13.

Valve Corporation, 2011. *Portal 2*. Video game. Bellevue, Washington, USA.

Watkins, M.. (2010). Desiring Recognition, Accumulating Affect.. In: Gregg, M. and
Seigworth, G.J. *The Affect Theory Reader*. Durham and London: Duke University
Press. p269-285.

Watson, A., Bennett4Senate, and Van Der Werf, H, (2007), Figure 4 [ONLINE].
Available at: <http://www.graffitiresearchlab.com/blog/laser-tag/> Last Accessed
28/02/2013.

Watson, A., Bennett4Senate, and Van Der Werf, H. *L.A.S.E.R Tag*. Computer Program.

Wood, D. (2010). *Rethinking the Power of Maps*. New York: Guilford Press.