Designing for Transcendence – the Interface as a Vehicle for Traveling between Selves

F A T I M A - N A D I A E L - I M A M

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Abstract:

Adopters of new technologies tend to interpret them in their own way, rather than simply using them as their inventors meant them to be used. There seems to be a deep social need to break free of technology as intended by its designers. This resonates with the yearning for transcendence, that mystics, artists and philosophers have been turning their attention to since time immemorial and which is the subject of recent research efforts in cognitive neuroscience. A case is made for conceptualising the interface as a vehicle for transcendence between different selves. If one accepts it, it follows that user experience can be improved by not sealing in the user in a predetermined role, and in extension by allowing for a more open-ended adoption of technology by users.

The paper makes use of empirical data collected during preparation and teaching of an undergraduate course commissioned by Konstfack University College of Arts, Crafts and Design in Stockholm. It attempts to translate the implications of re-thinking the interface as a vehicle for transcendence into guidelines to be embedded in designing for human-computer interaction.

Design för transcendens- Gränsnittet som färdmedel mellan olika subjekt

Sammanfattning:

Användare av ny teknik tenderar att bruka den på sätt som avviker från de tilltänkta och bryta sig loss från de begränsningar som utvecklaren av ny teknik skapat. Detta verkar spegla ett hos människor djupt förankrad längtan efter transcendens som uppmärksammats av mystiker, konstnärer, filosofer sedan urminnes tider och som en del senare forskningsprojekt inom den kognitiva-neurovetenskapen undersöker. Mot denna bakgrund ifrågasätter jag den gängse synen vi har på interfacedesign; jag argumenterar för att man kan konceptualisera det som ett färdmedel för transcendens mellan olika ”jag”. Om man godtar argumentationen, så följer det att användarupplevelsen förbättras av att man inte låser in användaren i en bestämd roll i förhållande till tekniken.

Detta gör jag med hjälp av data som inhämtats under en fältstudie som består av förberedelse och undervisning av en tre veckor lång heltidskurs på uppdrag av Konstfack. Resultaten från fältstudien har förankrats med hjälp av litteratur och slutligen legat till grund för ett antal riktlinjer för designarbete med människa- datorinteraktion.

Acknowledgements:
During my time at the Royal Institute of Technology my academic objective has been to develop an interdisciplinary mindset and to invest time in developing and realising my own ideas and research projects. I would like to thank my thesis supervisor Professor Bo Westerlund for his engagement and support throughout my thesis project preparations. Also I am eternally indebted to Professor Ronald Jones who gave me a unique opportunity to put together and teach the course at Konstfack, and without whom this project could not have been realised in its current form. I would also like to thank Palle Torsson, Dr Rolph Hughes as well as Dr. Leif Dalhberg for their insight and generous help in preparing the course at Konstfack. Finally I would like to thank Dr. Yousif Ali EL-Imam, Alberto Cottica as well as my students for their generous engagement in this project.

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1. Introduction

Introduction and main results

Virtual reality carries the promise of omnipotence for interface designers. Increased computing power and improved rendering software provide opportunities to fine-tune user experience; motion capture and surround technology allow us to re-create the user's sensorium to an unprecedented degree of completeness. This array of tools bestows the interface designer with almost godlike powers over the user.

However, the history of technology teaches us that top-down decisions about how users should use communication media are typically sidestepped by the users themselves. In the early days of telephony, AT&T actively tried for decades to stop subscribers of the service from using the phone to make non-business calls, which were referred to as "nuisance calls"; the popularity of "pink" (erotic) *messageries* in France running on the Minitel system in the 1980s was started by a user who hacked an early version of Minitel to make it able to send direct messages to other users (Rheingold, 2000); SMS text messages had been conceived as a channel of technical data to enable services like network monitoring, and its huge global success was totally unplanned for (Giussani, 2002). These examples are just a sample from a much longer list of technologies, in which communication media feature prominently, but which is by no means limited to them (Tapscott and Williams, 2007).

Devising and early adoption of new, unplanned for uses of technology - not to mention actively hacking it - is generally costly and time consuming. In order for users to engage so consistently in such activities there must be a deep social need to break free of technology as intended by its designers. This resonates with the yearning for transcendence that philosophers have been turned their attention to since time immemorial. Apparently, for humans to feel happy and meaningful, there needs to be at least the possibility - under some set of conditions - to access some other, better state. They must live in a world that they are not imprisoned in. Existentialist philosophy and neuroscience conceptualisations of what happens in the world allow for the possibility that an individual might travel across different worlds by travelling across different manifestations of that same individual, or "selves".[1]

If the possibility of transcendence[2] is essential to human happiness, and if transcendence means travelling across different selves, we are left with a direct challenge to the traditional notion of virtual reality as an all-encompassing, self-sufficient experience. Such an experience would not fit the normal patterns of use of technology, and it would in fact run against what seems to be a very deep-rooted need in human beings. The utopia of virtual reality, seen through this lens, becomes a dystopia, a prison, the Matrix.

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[1] Self-transcendence has many meanings and definitions in different contexts: 1- Religious: 2- Material: 3- Cognitive is the most interesting. Aldous Huxley for example, differentiates between up and sideways self-transcendence. My interest lies primarily in HCI and Cognitive science... So cognitive self transcendence. My conclusion is that existentialist/ phenomenologist accounts, or even post-phenomenologist accounts such as Latour´s actor-network theory of what happens in the world do not conceptually exclude the possibility that an individual may travel across different worlds by travelling across different manifestations of that same individual, or "selves".

[2] For definition of and discussion on “transcendence” see Key Concepts section, pg 16

But does transcendence stand on firm ground in information science? What would interface design look like, seen through this same lens? How would that compare to the top-down, immersive, sealed interface associated with virtual reality in the traditional sense? How would interface designers model the user in a transcendence perspective?

This thesis addresses these questions, and others related to them. My main conclusions are (1) that transcendence between selves is broadly consistent with embodiment theory; (2) that the physical body is an important gateway through which it is in principle possible think of interfaces that mediate inter-self and inter-subject transcendence; (3) that such interfaces would be likely to be much more open ended and less sealing than the ones normally associated with virtual reality in the traditional sense; in particular, metaphors seem to be more conducive to an engaging user experience than simulations.

Consistently with these results (though this was not intentional) this project was quite open-ended in method. It started with setting up a university course on the body and the self in virtual reality in April 2007, and took me on quite a long journey across disciplines as diverse as philosophy, cyber-feminism, performing arts, and even karate. As the research effort developed, it became clear that it was reaping great benefits from my interaction with the students who took part in the course. With their fresh, creative engagement in the technology-powered virtual worlds I introduced them to and their vivaciously critical distance from them, they provided the perfect focus group for me to think about technology users. I drew a lot of inspiration from them, and this work would not exist in its present form had it not been for them.

Objective

The objective of this thesis project was to gain insights on the implications of embodiment philosophy on interaction design by means of an empirical case study. The aim of this paper is to explore the extent to which such implications augment how we define interaction and interface design.

The Case Study

Masters and Slaves was a four-week Interdisciplinary Studios course designed for and taught at Konstfack University College of Arts, Crafts and Design in Stockholm. Interdisciplinary Studios are part of the foundations education offered by the Department of Interdisciplinary Studies at Konstfack, University College of Arts, Crafts and Design. The goal of the Interdisciplinary studio is to implement complex and innovative projects while maintaining a high level of artistic ambition. The studios are dedicated to broad themes that are relevant across disciplines and that challenge students creatively and intellectually. The studio aims to encourage the students to think critically and make decisions in complex and unpredictable situations, requiring them to be creatively entrepreneurial and innovative in their use of technologies and artistic practices in strategic collaborations. The eight course participants (three male, five female) were aged 22-30 and came from a variety of educational backgrounds in the arts. All students claimed to have had no exposure to the Second Life environment prior to attending the course.

Research Questions

In designing for interaction, our understanding of the interface rests on our knowledge about how human beings relate to people, things and the world outside their bodily or material selves. The interface is commonly conceptualised as an

embodiment or representation[3] that allows two or more entities to interact with each other and exchange information under certain conditions and constraints. An illustration of this understanding of the interface is of a layer, sandwiched between two autonomous entities, each separate from the world outside itself by a clear demarcation. If the expectations of information exchange between entities changes, then so does the definition of the interface. If the definition of the interface changes, it is reasonable to assume that this has implications on the practices of interaction and interface design.

We know that there is a correlation between presence[4] and immersion[5] in that a more immersive environment can lead to higher level of presence (Bowman and McMahan, 2007). We know that presence is intricately tied to affective engagement. We now know that affectivity is tied to the tactile-kinaesthetic body: that emotion and motion are dynamically congruent (Sheets-Johnstone, 1999). We know that presence and gaze (first person perspective) are intricately linked with immersion, both at diegetic and non-diegetic levels (imagined and enacted) (Wolf and Perron, 2003). Various accounts of the self have to, and do, co-exist (Siegel, 2005). In our corporeal interaction with others, agency[6] is commonly attributed to a "person in a body". This attribution is taken for granted in mainstream interaction and interface design.

In this paper I present evidence that embodiment theory[7] challenges this assumption by pursuing 3 questions:

1. Is it possible to achieve partial or total immersion in someone else's mind (To share subjective "mental" experiences)?

2. Is it possible to attain immersion in another "person"?

3. Is it possible to experience multiple simultaneous immersions?

Methodology

I initiated the empirical investigation by setting up a backdrop of general knowledge of embodiment theory, as opposed to the philosophical foundations of traditional virtual reality. Building on that, I then rolled out Master and Slaves, a three-week full-time Interdisciplinary Studios course, as a quasi-ethnographic empirical research tool, with the students, and myself, serving as participants-observers in the empirical investigation. The research questions were defined as the result of open-ended investigation throughout the course. I then pursued a new round of detailed, issue-related literature reading guided by observations from the course.

How to generate results in the course

During the initial phase of designing the case study, it became clear that a problem-solving approach would neither be engaging enough nor provide the most interesting discussions with students, and in extension material for the study. The main challenge in designing the case study was to define a research strategy for manoeuvring in contexts where complex and interrelated questions continuously pop-up in response to previous answers, in seemingly open-ended landscapes of

[3] For discussion on meaning of this term, see "representation" in"Key Concepts" section
For discussion on meaning of this term, see "presence" in"Key Concepts" section
For discussion on meaning of this term, see "immersion" in"Key Concepts" section
For discussion on meaning of this term, see "agency" in"Key Concepts" section
For discussion on meaning of this term, see "embodiment theory" in "Key Concepts" section

paradigms. Further research findings in one research field may affect how interpretation of empirical findings informs any insights on all the questions. A traditional problem solving approach seemed ill suited for the thesis project, as it requires the paradigm to be defined in advance, and the problem to be clearly defined within that paradigm. Instead, the research questions were identified as "wicked problems"[8] (Rittel and Webber, 1973). Jonathan Rosenhead´s criteria for dealing with wicked problems (Ritchey, 2005) were adopted as guidelines for the design and implementation of the case study.

- Accommodate multiple alternative perspectives rather than prescribe single solutions
- Function through group interaction and iteration rather than back office calculations
- Generate ownership of the problem formulation through transparency
- Facilitate a graphical (visual) representation for the systematic, group exploration of a solution space
- Focus on relationships between discrete alternatives rather than continuous variables
- Concentrate on possibility rather than probability

In short, Rosenhead suggests that one explores the large questions using different approaches and - by suggesting various potential solutions to specific questions - explores the identified, more specific questions, finds the different parameters, and at a later stage tests how many of their parameters can coexist as a way of making decisions about which of these solutions to use and in which combinations. This approach is similar to one of artistic innovation as it allows for the risks that are involved in working with the existent but unknown or ill defined in order to discover opportunities for new innovations that are difficult, if not impossible to predict in advance. In designing the course I made use of Rosenhead's methodology within the parameters of the "Interdisciplinary studio" course format as described by the degree requirements and presented in Appendix 2.

My role in the course

My role as a participant in the Masters and Slaves was that of a designer, project manager and documentary photographer and researcher. My work involved putting together a course description, a board of education-approved syllabus, recruiting relevant guest-lecturers and speakers, designing assignments as well as workshops with guest lecturers, teaching students, supervising student projects, course budgeting, documenting the course and archiving documented material, reviewing and critique of submitted student assignments. Although I was given free hands in terms of course design and content, the course syllabus and description was presented to and discussed with Professor Ronald Jones prior to the course initiation. Also, the many instant messenger discussions with Palle Torsson and colleagues, as well as with my thesis supervisor, Professor Bo Westerlund, about specific aspects of the modules or exercises helped validate my approach in designing the different aspects of the course and in extension of the research.

[8] "Wicked problem" is a term used to describe a problem that is "difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize. Moreover, because of complex interdependencies, the effort to solve one aspect of a wicked problem may reveal or create other problems." (wicked problem, 2009)

As my involvement in the project and in the work with individual students required much of my attention and time I found it difficult to maintain reflective distance or to indulge in introspective reflection. My strategy was simply to document anything that caught my attention in the form of Field notes, or that came to mind in the form of more elaborate Log notes, and to let a camera run during scheduled meetings with the students (including during lectures and workshops). I then used my accumulated field- and log notes and personal reflections indirectly related to the course and penned during one month period after work with the students had come to an end, to navigate my way around the large volume of archived documented material. The method of artistic innovation does allow for a higher degree of subjectivity and this paper was in a sense as much about investigating new research approaches and methodologies in the highly complex and ever-evolving mediated-communication- related research contexts, as about generating new insights on the implications of embodiment philosophy on HCI and interaction design.

2. Key concepts

In this section I introduce, in alphabetical order, a few ideas and terms that may an aid to understanding the rest of this paper and which. In cases where the underlying concepts are ambiguous or closely linked to an important discussion I have attempted to introduce and summarise them as part of the definition of the term or suggest material for further reading.

Agency

> *"A person or thing through which power is exerted or an end is achieved" (agency, 2009)*

This definition of human agency entails the claim that humans do in fact make decisions and enact them on the world. The term agency is closely related to, and often used in conjunction with, concepts such as personal autonomy, intentionality, actions, the self and governance (Buss, 2002). According to Hegel and Marx (Hegel's *Geist* and Marx's *Universal class*), human agency is a collective, historical dynamic, rather than a function arising out of individual behaviour (Bandura, 2001). Especially relevant to this paper are the dynamics of agency as related to "the self" and "personal autonomy ". For further reading on "personal autonomy" the online version of the Stanford Encyclopaedia of Philosophy has an excellent entry which I have enclosed as an attachment, and I have presented the concept of "the self" in detail in the " Immersion as augmenting the self and perception in the literature" section of this paper.

Embodiment

> *"The act of embodying: the state of being embodied" (embodiment, 2009)*

> *"1: to give a body to (a spirit): incarnate*
> *2 a: to deprive of spirituality b: to make concrete and perceptible*
> *3: to cause to become a body or part of a body: incorporate*
> *4: to represent in human or animal form: personify <men who greatly embodied the idealism of American life — A. M. Schlesinger b1917>" (embodied, 2009)*

Embodiment Philosophy

Is based on the argument that almost all of human cognition depends on and makes use of such concrete and "low-level" facilities as the sensor-motor system and the emotions. Embodiment Philosophy rejects both dualism vis-à-vis mind as well as claims that human reason can be basically understood without reference to the underlying "implementation details. The Embodiment thesis is very close to theories of mind proposed by members of the broad existential tradition in philosophy (Kant, 1755) (Merleau-Ponty, 1945) (Hollier, 1989).

> *"We are neural beings," Lakoff states, "Our brains take their input from the rest of our bodies. What our bodies are like and how they function in*

the world thus structures the very concepts we can use to think. We cannot think just anything — only what our embodied brains permit."(Lakoff & Johnson, 1999)

According to George Lakoff three main arguments in favour of Embodiment Philosophy are:

1. Using evidence from neuroscience and neural network simulations, he argues that certain concepts, such as colour and spatial relation concepts (e.g. "red" or "over"; see also *qualia*), can be almost entirely understood through the examination of how processes of perception or motor control work.

2. Based on cognitive linguistics' analysis of figurative language, he argues that the reasoning we use for such abstract topics as warfare, economics, or morality is somehow rooted in the reasoning we use for such mundane topics as spatial relationships.

3. Based on research in cognitive psychology and some investigations in the philosophy of language, he argues that very few of the categories used by humans are actually of the black-and-white type amenable to analysis in terms of necessary and sufficient conditions. On the contrary, most categories are supposed to be much more complicated and messy, just like our bodies (Lakoff & Johnson, 1999)

Embodiment philosophy is in a broader sense, an umbrella term for proponents of anti-isolationist assertions that " range from the relatively innocent insistence that we won't achieve a balanced vision of what the brain does until we pay more heed to the complex roles of body and world, to the self-consciously revolutionary accusation that mind itself is not, after all, a special realm populated by internal models and representations so much as an inextricable interwoven system, incorporating element of brain, body and world -- a system which resists informative analysis in terms of the old notions of model, representation and computation" (Clark, 1998). There are many criticisms of various aspects of Embodiment Philosophy. For example the attempt to use cognitive processes for creating mathematical ideas (lakoff & Nunez, 2001) is criticised on the grounds that it shows a profound misunderstanding of what mathematics is and how it is developed by amongst others mathematician Bonnie Gold (Gold, 2001); their assertion that as we are incapable of accessing a transcendent mathematical reality and that this is grounds for its being irrelevant is refuted by Burton Vorhees as being fundamentally flawed in its perspective;

"As often formulated, the problem of access to mind-independent mathematical objects is misconceived. The mystery is not in the ability to perceive mathematical objects, but in the ability to perceive any 'object' whatsoever. Mathematics, as carried out by human beings, is embodied. It suffers all of the slings and arrows that go along with that embodiment. In emphasising this, Lakoff & Núñez perform a valuable service. Ironically, however, their attempt to give mathematics a more human face ignores what is perhaps the most significant human aspect of mathematics. For the Platonist, it is the ability to have intuitive access to what is transcendent, whatever the mode of its existence, that is uniquely human." (Voorhees, 2004)

There are various research communities currently involved in outlining the connection between the body, individual structures in the brain and aspects of the mind such as consciousness, emotion, self-awareness and will; In Neuroscience

prominent researchers include Gary Edelman and António Damasio while biology has inspired, amongst others, Gregory Bateson, Elenor Ros, Francesco Varela as well as Patrica Carpenter to develop "Enactivism" and the "fractal catalytic model" which are closely related ideas (Edelman, 2004) (Damasio, 1999) (Maturana & Varela, 1987)(Varela, Thompson & Rosch, 1992). Finally, the dynamic relationship between embodiment philosophy and the embodiment movement within the AI community (Clark, 1997) has also given emotions a new status in philosophy of mind as indispensable constituent, not a non-essential addition to rational intellectual thought (Picard, 1997).

Existentialism

Is distinguished from other schools of thought by the idea that no general, non-formal account of what it means to be human can be given, since that meaning is decided in and through existing itself;

> *"Existence is "self-making-in-a-situation" (Fackenheim 1961:37). In contrast to other entities, whose essential properties are fixed by the kind of entities they are, what is essential to a human being—what makes her who she is—is not fixed by her type but by what she makes of herself, who she becomes. [4] The fundamental contribution of existential thought lies in the idea that one's identity is constituted neither by nature nor by culture, since to "exist" is precisely to constitute such an identity...*
>
> *Traditionally, philosophers have connected the concept of existence with that of essence in such a way that the former signifies merely the instantiation of the latter. If "essence" designates what a thing is and "existence" that it is, it follows that what is intelligible about any given thing, what can be thought about it, will belong to its essence. It is from essence in this sense—say, human being as rational animal or imago Dei—that ancient philosophy drew its prescriptions for an individual's way of life, its estimation of the meaning and value of existence. Having an essence meant that human beings could be placed within a larger whole, a cosmos that provided the standard for human flourishing. Modern philosophy retained this framework even as it abandoned the idea of a "natural place" for man in the face of the scientific picture of an infinite, labyrinthine universe. In what looks like a proto-existential move, Descartes rejected the traditional essential definitions of man in favour of a radical, first-person reflection on his own existence, the "I am." Nevertheless, he quickly reinstated the old model by characterizing his existence as that of a substance determined by an essential property, "thinking." In contrast, Heidegger proposes that "I" am "an entity whose what [essence] is precisely to be and nothing but to be" (Heidegger 1985:110; 1962:67). Such an entity's existing cannot, therefore, be thought as the instantiation of an essence, and con" (existentialism, 2009)*

Immersion

Is the state of consciousness where an immersant's awareness of physical self is diminished or lost by being surrounded in an engrossing total environment; often artificial (Nechvatal, 1999). This state is frequently accompanied by spatial excess, intense focus, a distorted sense of time, and effortless action (Varney, 2006).

Staffan Björk and Jussi Holopainen describe six different types of immersion (in gaming contexts) (Björk & Holopainen, 2004):

1. **Sensory-motoric:** is experienced when performing tactile operations that involve skill. Players feel "in the zone" while perfecting actions that result in success.

2. **Cognitive**: is more cerebral, and is associated with mental challenge. Chess players experience strategic immersion when choosing a correct solution among a broad array of possibilities.

3. **Emotional**: occurs when players become invested in a story, and is similar to what is experienced while reading a book or watching a movie.

4. **Spatial**: occurs when a player feels the simulated world is perceptually convincing. The player feels that he or she is really "there" and that a simulated world looks and feels "real".

5. **Psychological**: occurs when a player confuses the game with real life.

6. **Sensory**: is an experience of entering into the three-dimensional environment, and being intellectually stimulated by it. The player experiences a unity of time and space as the player fuses with the image medium, which affects impression and awareness.

Phenomenology

> *" The term 'phenomenology' designates two things: a new kind of descriptive method which made a breakthrough in philosophy at the turn of the century, and an a priori science derived from it; a science which is intended to supply the basic instrument () for a rigorously scientific philosophy and, in its consequent application, to make possible a methodical reform of all the sciences. Together with this philosophical phenomenology, but not yet separated from it, however, there also came into being a new psychological discipline parallel to it in method and content: the a priori pure or "phenomenological" psychology, which raises the reformational claim to being the basic methodological foundation on which alone a scientifically rigorous empirical psychology can be established." (Phenomenology, 1971)*

Phenomenology is one of the two dominant philosophical movements of the 20th century and has several areas of overlap with the other, Existential philosophy or existentialism (described above). Phenomenology is in essence the study of structures of consciousness as experienced from the first-person point of view (phenomenology, 2009), the aim being to help us get at the world that exists prior to our conceptualising it. Phenomenology has developed as a heterogeneous movement with many branches and although it would be an exaggeration to claim that phenomenology is a philosophical system with a clearly delineated body of doctrines (Zahavi, 2008) it continues to attract proponents and elicit criticism:

> *"Does phenomenology—above all in its Husserlian form—remain a viable, living philosophical promise? Or has phenomenology become merely "classical" phenomenology, having matured into a legacy of influence, a chapter in the history of thought interesting only for the purposes of a historical narrative of ideas? The truth may be something in between. The influence of phenomenology, and the different forms it*

has taken, is so varied and complex that the horizon of phenomenology can no longer be taken in at a single glance, as it were. If the promise of a renewed idea of and commitment to philosophy remains alive, it is surely mediated by a remarkably diverse intellectual embodiment, one that is not without its tensions. Phenomenological philosophy is a living philosophy that finds its home in territories far beyond the institutional field of philosophy, which even within academia is not always the center of activity. On the other hand, if the promise for a renewal remains salient to the meaning of the breakthrough of phenomenology, then it is doubtful that the ongoing development of ever more sophisticated "phenomenological perspectives" in more and more areas of intellectual and cultural activity is in and of itself the fulfilment of this promise. Phenomenology must, to be both a tradition and a philosophy, reflect on its breakthrough, precisely in order to be able to look ahead. It needs to ask the fundamental question of its sense, for it is only in this way that a tradition can look ahead of itself." (Dodd, 2008)

The work of Edmund Husserl the 20th century philosopher recognised as its founding father had significant influence on the thinking of amongst others Maurice Merleau-Ponty and Jean-Paul Sartre. Husserl disagreed with the belief that knowledge arrives only out of subjective experiences and that psychology clarifies the subjective elements in all philosophical reasoning, and in extension clarifies reasoning. This belief was held by many of his contemporaries, heavily influenced by John Locke's empiricism, and best formulated by John Stuart Mill:

" [Logic] owes all its theoretical foundations to psychology, and includes as much of that science as is necessary to establish the rule of the art." (Husserl, 1982)

In order to overcome the ambiguity surrounding subjective experience he suggests, that one directs attention towards one's own experience in such a way that one can describe it as fully and completely as possible;

In his view, experience includes both those concrete particulars of this situation here now, experienced as naively as we can experience them, and the categories of meaning to which its things and events belong. A Red Delicious and a Fuji, for example, share the category of meaning that we might call "apple-ness." (Shades of Plato's pure forms!) These categories of meaning are "structures" in consciousness that are invariant and essential. Husserl used the term "essence," for them, setting the stage for Jean-Paul Sartre's famous existential dictum that "existence precedes essence"." (Daniels, 2005)

For more reading on the ongoing debate about and within phenomenology I suggest Dan Zahavi´s submission "Does (Husserlian) Phenomenology have a future?" to the "Philosophy: Re-thinking Subjectivity" Conference (Zahavi, 2008).

Presence

Is a term that describes a user's subjective psychological response to a VR system (Bowman and McMahan, 2007). It is a theoretical concept describing the effect that people experience when they interact with a computer-mediated or computer-generated environment (Sheridan, 1994). Lombard and Ditton (1997) defined presence as "an illusion that a mediated experience is not mediated" and the following entry on www.wikipedia.org describes the evolution of the term into its

current definition:

> *"The word "presence" is derived from the term "telepresence," which was coined by Massachusetts Institute of Technology professor Marvin Minsky in 1980 (Steuer, 1993). His research explained telepresence as the manipulation of objects in the real world through remote access technology (Minsky, 1980). For example, a surgeon may use a computer to control robotic arms to perform minute procedures on a patient in another room. Or a NASA technician may use a computer to control a rover to collect rock samples on Mars. In either case, the operator is granted access to real, though remote, places via televisual tools.*
>
> *As technologies have progressed, particularly with the advent of the Internet, the need for a new broader term arose. Sheridan (1992) extrapolated Minsky's original definition. Using the shorter "presence," Sheridan explained that the term refers to the effect felt when controlling real world objects remotely as well as the effect people feel when they interact with and immerse themselves in virtual reality or virtual environments. This side of presence gained its first pop culture reference in 1984 with William Gibson's pre-World Wide Web science fiction novel Neuromancer, which tells the story of a cyberpunk cowboy of sorts who accesses a virtual world to hack into organizations. In essence, presence to Sheridan represents two-sides of the same coin. It is the effect felt from engaging in either telepresence or virtual presence.*
>
> *Lombard and Ditton (1997) went a step further and enumerated six conceptualizations of presence. First, they wrote, presence can be a sense of social richness; the feeling one gets from social interaction. Second, presence can be a sense of realism, such as computer-generated environments looking, feeling, or otherwise seeming real. Third, presence can be a sense of transportation. This is a more complex concept than the traditional feeling of one being there. Transportation also includes users feeling as though something is "here" with them or feeling as though they are sharing common space with another person together. The fourth concept is that presence can be a sense of immersion, either through the senses or through the mind. Fifth, presence can provide users with the sense they are social actors within the medium. No longer passive viewers, users, via presence, are given a sense of interactivity and control. The sixth and final concept is that presence can be a sense of the medium as a social actor.*
>
> *Two studies illustrate this idea of the medium as a social actor. Bracken and Lombard (2004) suggested that people, especially children, interact with computers socially. The researchers found, via their study, that children who received positive encouragement from a computer were more confident in their ability, were more motivated, recalled more of a story and recognized more features of a story than those children who received only neutral comments from their computer. Nan, Anghelcev, Myers, Sar, and Faber (2006) found that the inclusion of anthropomorphic agents that relied on artificial intelligence on a Web site had positive effect on people's attitudes toward the site. The research of Bracken and Lombard and Nan et al. also speak to the concept of presence as transportation. The transportation in this case refers to the computer-generated identity. Users, through their interaction, have a sense that these fabricated personalities are really "there."*

Communication has been a central pillar of presence since the term's conception. And the Internet, primarily a communicative medium, has depended on virtual presence since its conception. Rheingold (1993) and Turkle (1995) offered MUDs as early examples of how communication developed a sense of presence on the Web prior to the graphics-heavy existence it has developed today. "MUD stands for Multi-User Dungeons – imaginary worlds in computer databases where people use words and programming languages to improvise melodramas, build worlds and all the objects in them, solve puzzles, invent amusements and tools, compete for prestige and power, gain wisdom, seek revenge, indulge greed and lust and violent impulses" (Rheingold, 1993, p. 145). While Rheingold focused on the environmental sense of presence that communication provided, Turkle focused on the individual sense of presence that communication provided. "MUDs are a new kind of virtual parlor game and a new form of community. In addition, text-based MUDs are a new form of collaboratively written literature. MUD players are MUD authors, the creators as well as consumers of media content. In this, participating in a MUD has much in common with script writing, performance art, street theater, improvisational theater – or even commedia dell' arte" (pp. 11-12).

Turkle explained that much of the presence conveyed in these early text-based worlds depended on descriptions by the users. No one could see one user hug or slap another. But users simply described what happened and let the mind do the rest. Turkle also pointed out, however, that the people who populate virtual worlds could be fabricated identities of real people or could be simply computer-generated bots. Online, you are whoever you say you are. Further blurring the lines, Weimann (2000) wrote that media scholars have found when virtual experiences are very similar to real-life experiences, people can confuse their own memories and have trouble remembering if those experiences were mediated or not." (Presence, 2009)

Representation

"1. Presence, bearing, air; Appearance; impression on the sight. 2. An Image, likeness, or reproduction in some manner of a thing; a material image or figure; a reproduction in some material or tangible form; in later use, a drawing or painting. (Of a person or thing); The action or fact of exhibiting in some visible image or form; the fact of expressing or denoting by means of a figure or symbol; symbolic action or exhibition. 3. The exhibition of character and action upon the stage; the performance of a play; Acting, simulation, pretence. 4. The action of placing a fact, etc., before another or others by means of discourse; a statement or account, esp. one intended to convey a particular view or impression of a matter in order to influence opinion or action. 5. A formal and serious statement of facts, reasons, or arguments, made with a view to effecting some change, preventing some action, etc.; hence, a remonstrance, protest, expostulation. 6. The action of presenting to the mind or imagination; an image thus presented; a clearly conceived idea or concept; The operation of the mind in forming a clear image or concept; the faculty of doing this. 7. The fact of standing for, or in place of, some other thing or person, esp. with a right or authority to act on their account; substitution of one thing or person for another. 8. The fact of representing or being represented in a legislative or deliberative assembly, spec. In Parliament; the position, principle, or system implied by this; the aggregate of those who thus

represent the elective body." (Representation, 2009)

Representation is a many faceted and confusing topic, currently under debate in academia as well as in society in general. Within the arts it has often been associated with aesthetics and semiotics and "... is an extremely elastic notion, which extends all the way from a stone representing a man to a novel representing the day in the life of several Dubliners." (Mitchell, 1995)

I have further introduced the term and its significance in Human Computer Interaction contexts in the " Representations and Perspectives" section later in this paper.

Transcendence

" 1. The action or fact of transcending, surmounting, or rising above; {dag} ascent, elevation (obs.); excelling, surpassing; also, the condition or quality of being transcendent, surpassing eminence or excellence: = TRANSCENDENCY.

2. Elevation or extension beyond ordinary limits; exaggeration, hyperbole. Obs. rare.

3. Math. The fact of being transcendental: see TRANSCENDENTAL

1. Of transcendent quality or nature; surpassing; excelling; exalted: = TRANSCENDENT a. 1.

2. Philos. a. Orig. in Aristotelian philosophy: Transcending or extending beyond the bounds of any single category; = TRANSCENDENT a. 4a. By 17th c. writers often made synonymous with metaphysical. b. In the philosophy of Kant (1724-1804): Not derived from experience, but concerned with the presuppositions of experience; pertaining to the general theory of the nature of experience or knowledge, a priori; critical (see CRITICISM 2c). c. Used of any philosophy, which resembles Kant's in being based upon the recognition of an a priori element in experience. d. By Schelling 'transcendental philosophy' was used for the philosophy of mind as distinguished from that of nature.

3. In uses derived from the philosophical sense: a. beyond the limits of ordinary experience, extraordinary. b. Super-rational, superhuman, supernatural. c. Vaguely, Abstract, metaphysical, a priori.d. Applied to the movement of thought in New England of which Emerson was the principal figure: see TRANSCENDENTALISM 1b.e. Transcendental meditation: a method of relaxation and meditation based on the theory and practice of yoga popularized in the West by the Maharishi Mahesh Yogi; abbrev. TM (see T6a); hence transcendental meditator.

4. Math. Not capable of being produced by (a finite number of) the ordinary algebraical operations of addition, multiplication, involution, or their inverse operations; expressible in terms of the variable only in the form of an infinite series.

The typical transcendental functions are sin x, ex, log x." (Transcendence & Transcendental, 2009)

Transcendence as a concept is a fascinating one on many levels and for a variety of different reasons; if for no other reason than for the fact that it has held the interest of artists, mystics, philosophers and scientists throughout the ages. Alfred Schutz goes so far as to identify it as a fundamental category of human experience:

> *"To be human, is to be limited by the transcendence of time, space, embodiment, alterity, society and nature. Yet, to be human is to be discontent with these limitations and to seek ways to be more connected to other beings, to other cultures and societies, and even to other provinces of meaning such as dreams or a God of religious belief. The experience of transcendence, then, it incorporates the ongoing paradoxical presentation of limitation and possibility, isolation and unification, which are always co-presented in all human encounters with the world." (Schutz, 2003).*

While the Latin origins of the English "transcendence", "scandere" (to ascend/to climb) and "trans" or across, indicates that it has something to do with negotiation of boundaries, the term has different but related primary meanings, and a wide variety of usage. The main distinction between the ways in which the term is used is whether the main discussion is considered with actions or qualities of the ego or personal self or whether the discussion is focused on experiences conceptualised as being beyond those centred in the ego or personal self (Washburn, 1990):

1. Religious/ Theological: " is used primarily with reference to God's relation to the world and is particularly important in theology. Here transcendent means that God is completely outside of and beyond the world, as contrasted with the notion that God is manifested in the world. This meaning originates both in the Aristotelian view of God as the prime mover, a non-material self-consciousness that is outside of the world. Philosophies of immanence such as stoicism, Spinoza, Deleuze or pantheism maintain that God is manifested in and fully present in the world and the things in the world". (Transcendence, 2009)

2. Philosophical: " in one meaning which originated in Medieval philosophy, concepts are transcendental if they are broader than what falls within the Aristotelian categories that were used to organised reality conceptually" (Transcendence, 2009), known in medieval terms as the praedicamenta (Studdman, 2007). So in medieval thought, transcendence is the quality or act of not fitting into one of the categories Substance (or essence, "*ousia"*), Quantity (or "how much, "*poson"*), Quality (of what kind or quality, "*poion"*), Relation (toward something, "*pros ti"*), Place (where, "*pou"*), Time (when, "*pote"*), Position (to lie, "*keisthai"*), State (to have, "*echein"*), Action (to make or to do, "*poiein"*), or Affection (to suffer or to undergo, "*paschein"*) (Categories, 2009). Within the more recent philosophical strands, the term transcendence has acquired additional meanings. Within phenomenology, the "transcendent" is that which transcends our own consciousness and is "objective", as opposed to that which is a phenomenon of consciousness, so transcendence is some sort of migration towards a perceived objective truth. The existentialists have two categories for subjective experiences based on the attitude one can hold towards oneself: first person practical agent subjective experience, or third person theoretical observer. Within the Existentialist school transcendence also has to do with a higher objective truth, but in this context refers more specifically to the agentic perspective; Kant defined the transcendent is that which lies beyond what our faculty of knowledge can legitimately know while Hegel argued that to know a boundary is also to be aware of what it bounds and as such what lies beyond it, in other words to already have transcended it.

A third perspective on "transcendence" is one that is highlighted in the on-going

discussion about the relationships between humans and the material culture or technology within philosophy of technology. In this context the discussion highlighted by Peter Paul Verbeek is one that operates within a context where Technology is understood as a framework that precedes and shapes everything we do. In this context it is understood that we need to move beyond modern subject-object distinctions in thinking about human-technology relations and it is within this context I make use of the term transcendence (Verbeek, 2006).

3. The Case Study

In this section I present the main observations in the form of course highlights, and then set the findings against an extra round of detailed, issue-related literature reading.

Masters and Slaves- a course at Konstfack

Following several informal conversations regarding my research interests, Professor Ronald Jones approached me in April 2007 with a request to design a four-week interdisciplinary studios course to be taught in October of the same year at Konstfack.
For personal reasons, I was interested in eating disorders, and was looking at the relationship that anorectics entertain with their bodies: they seem to be trying to style themselves as masters, and their own bodies as their slaves. In fact, the body-as-slave theme seemed not to be restricted to anorectics; on the contrary, it would surface in different cultural loci, like a thread woven into cyber-culture. Cyber-feminist thinkers would maintain that constantly trying to enslave their own bodies is the normal state for most women (Sanz and Burkitt, 2001); interest in Cyborgs and BDSM sexual aesthetics is quite pervasive on the Net.
By contrast, embodiment theory maintains that the distinction between the self and the body is spurious. The body has an enormous influence on determining who we become: it should not be thought as separate from the self, and therefore it can't be enslaved by the self.
These two approaches are mutually exclusive, and it seemed likely that they would have different consequences on interface design. I decided to use the course to investigate this issue. I would think of the students as a research team in the spirit of Rosenhead's methodology, which meant that interaction in the classroom would follow certain rules:

- focusing "on relationships between discrete alternatives rather than continuous variables" and in accommodating "multiple alternative perspectives rather than prescribe single solutions" by examining multiple lines of reasoning using a variety of approaches.

- structuring the interaction with and amongst the students in a space where we were surrounded by visual representations of their uniquely individual approaches towards examining the themes, so as to allow us all to have equal "ownership of the problem formulation through transparency".

- constantly dispelling probability as a limiting factor in all interactions with the students. They would be encouraged to playfully explore whatever thoughts caught their interest and fuelled their curiosity.

With these rules in place, two central concepts precipitated out of the course: "immersion" and "self" as somehow related to "agency". They continued to pop up repeatedly in different contexts regardless of perspective and context throughout the duration of the course.
With its central concern being the understanding of implications of interaction, experience and embodiment, the course found a natural home and setting in Second Life, the Linden Labs online virtual reality gaming platform, and students were expected to participate in related seminars and lectures. They were also expected to participate into offline immersive experiences, and compare immersive experiences in different environments. The course is described in more detail in Appendix 1.

Findings from the course: immersion augments who we are and our perception of the world

I initiated the first module by giving the students an assignment in which they were expected to select a few words from a selection presented to them, and to visualise and document their reflections on how they were related with no restrictions as to use of method or media. The students were then introduced to the cultural and historical developments within the linden- labs second Life platform as well as taught the basic technical skills of navigating, interacting and building in Second Life. After the presentation students were left alone to explore the environment independently, and the ensuing discussion shed light on interesting observations and questions to be investigated.

I feel that a question posed by one of the students captured the essence of all the topics and issues discussed both during and after the day: *"Do we change our consciousness about "I", "identity", "presence" by the use of virtual worlds?".* The insight that performance through their avatars has effect on their cognition was seemed to ring true with several of the students. One student stated that "through one´s avatar in second life one gains experiences in the real world". Another student presented us with two representations of water, one of which was a photographic reproduction and the other a print of a computer-generated image of water. She remarked that spending time in virtual environments had affected her perception of "real" and "illusion" in the sense that she experienced the CGI version to be more life-like and "real" than the photography.

Two main observations came out of these exercises: Immersion has an effect on who you are as well as on how you perceive the world.

Immersion as augmenting the self and perception in the literature

"The nature and meaning of the self are subject to constant re-definition, as it is ever again taken up on behalf of some partisan aim or project" (Siegel, 2007). In Western thought, the basis of selfhood has been sought along three dimensions:

1. The bodily/material: our selves and whatever consciousness we have of them are housed in our bodies and are shaped by body´s needs. The physical corporeal existence of individuals.

2. The relational: our selves are what our relations with society and with others shape and or allow us to be. This dimension arises from social and cultural interaction, common connections and involvement give us collective identities.

3. The reflective dimensions: Self is an active agent of its own realization - we are what our attention to ourselves makes us be. The categories are broad and allow for many, and sometimes opposed ways of thinking about the self to find footing within them:

"For example, bodily selfhood means one thing if one views the body in terms of organs and needs, as Freud did, and another when it is seen as the vehicle of genes and their imperatives, as some evolutionary biologists do in our day. The body regarded as a kind of machine, in the way certain early modernists proposed, implies a mode of selfhood very different from the one that appears when the body is taken as a restless source of ever-changing desire and will, as Schopenhauer and Nietzsche (preceded by the Marquis de Sade) had it. Similarly, relational selfhood means one thing when it is conceived in Marx´s terms of class division and social

conflict, and a different one when it is posited in the classical anthropological way, as operating through a culture that somehow infuses all the members of a population...weaving a pattern of continuity out of the moments or stages or its own evolving being" (Siegel, 2005)

While each of the three dimensions fosters common features among the self-conceptions that arise along or within it, any account of the self falls into one of two categories; it is either one or multi-dimensional (Siegel, 2007).

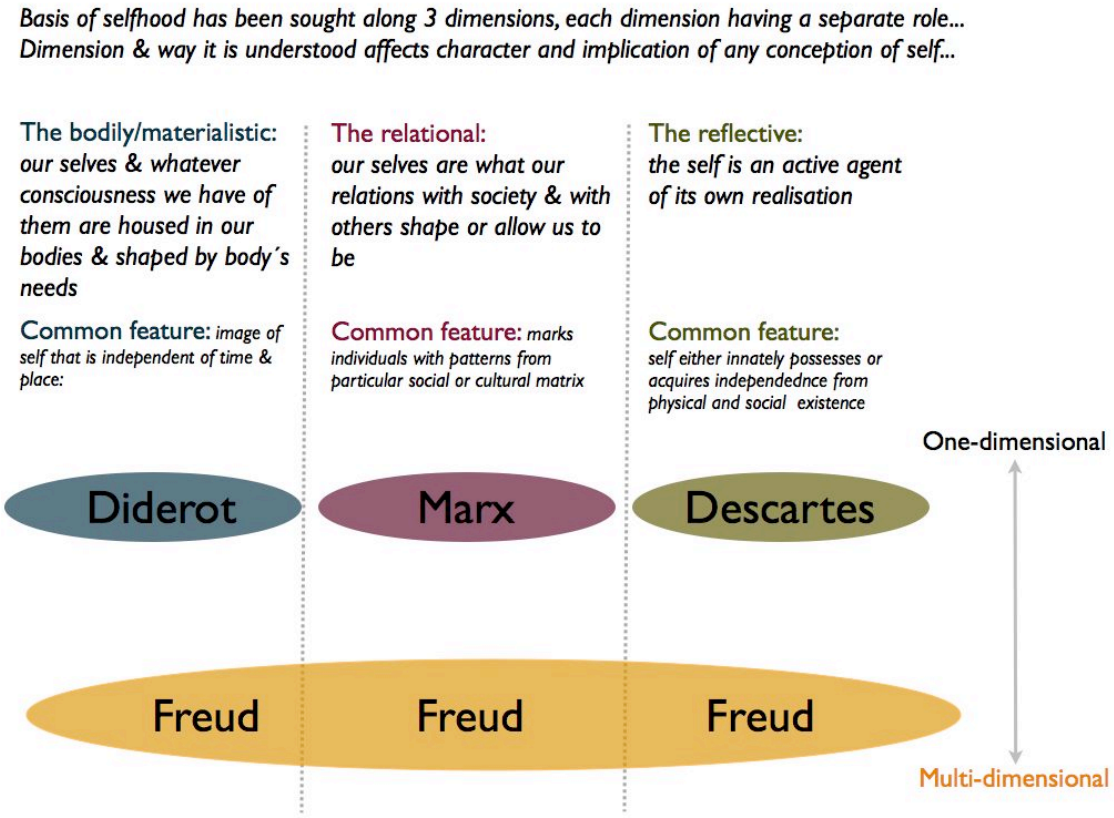

Fig.1 - Western thinking about the self- summary with examples. Source: author.

Several prominent thinkers have formulated accounts of the self that move away from ideas of stable "selfhood" and replace them with different, fluid and "temporal" understanding of the self. Several post-Kantian western philosophers conceptualised of it as an entity that transcends its own boundaries; Nietzsche describes the relationship between the self and the world in terms of a will that expresses itself in a constant expenditure of transformative energy rather than in devotion towards self preservation. I came across an especially intriguing description of selfhood as it provides an account of the self in which the relationship between subjectivity and multiplicity is "either and" rather than "either or"; According to Deleuze, the identities with which we are confronted in experience are not who we "are" in a metaphysical sense. Who we are is the coexistence of relationships between different identities that are constantly in flux. So we are any and all configurations of one or multiple, one and multiple, one is multiple etc. Multiple simultaneous immersion is possible because our field of consciousness is one of multiplicity (Deleuze, Guattari & Massumi; 2004):

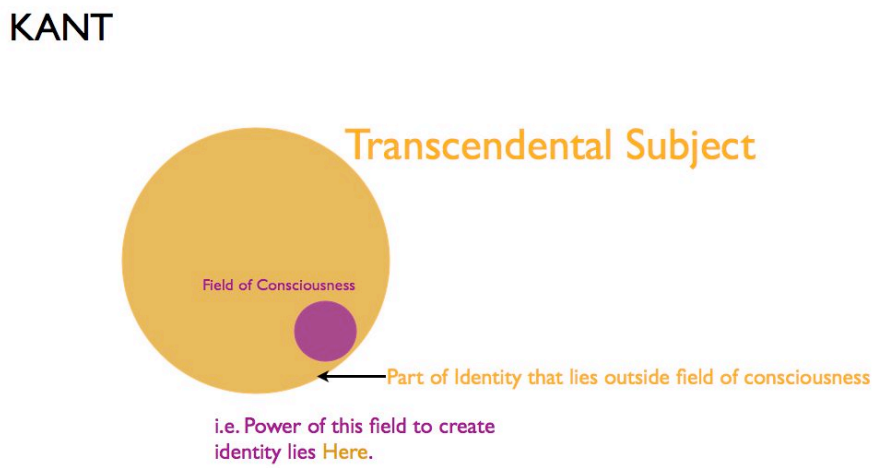

Fig.2 - Visualisation of Kant on consciousness and the subject.Source: author.

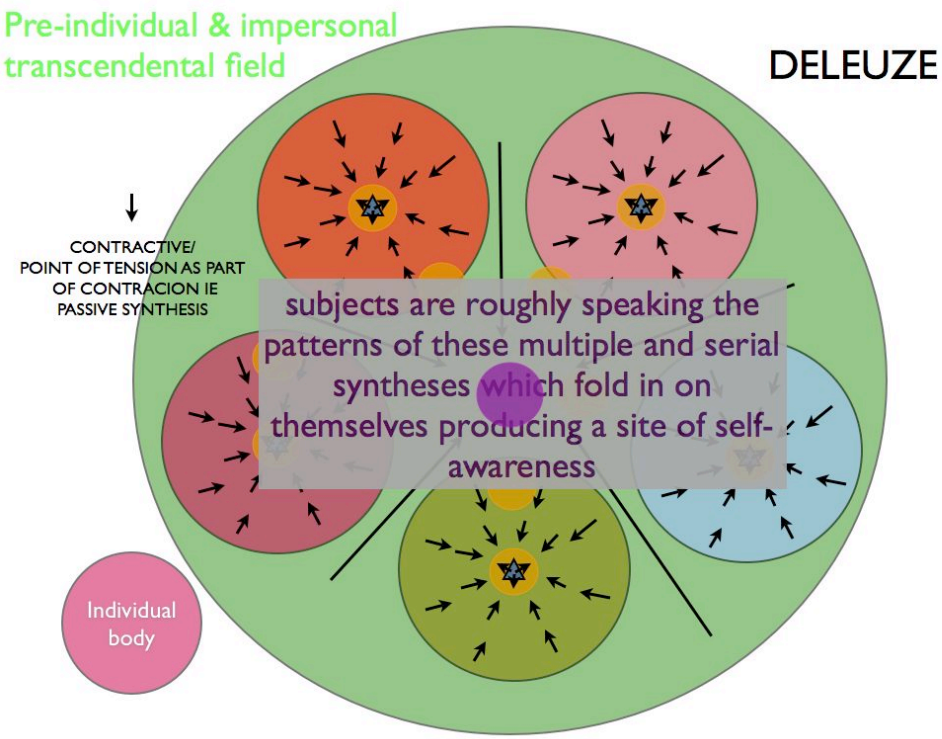

Fig.3 - Visualisation of Deleuze on consciousness and the subject. Source: author.

While working with the students, questions regarding identity, presence and reality often popped up during the various discussions, and especially after their initial exploration of the Second Life environment. The students asked what the constituents of the self were; also, during my literature review, I repeatedly come across the terms person, self, agent and subject. While we intuitively understand that they serve to demarcate a distinction between that which is related to ”oneself” and that which is conceived to be related to ”others” or to the world outside ourselves, these terms are used interchangeably and ambiguously, perhaps because there is at the current time no single unified notion of our inner lives (Lakoff and Johnson, 2005).

When George Lakoff and Mark Johnson outlined the general structure for their metaphorical conception of the self, they gave shape to models that help us understand various experiences that are consequences of our living in social contexts with the kinds of brains and bodies that we have (Lakoff and Johnson, 2005). Lakoff and Johnson’s analysis showed that this metaphoric system is based on a conception of the individual or person as twofold; they showed that the individual can be conceptualised in terms of different metaphors for various relationships between one ”subject” and one or more ”selves” at a time (Lakoff and Johnson, 2005). Based on their findings a person or individual can be seen as a metaphorical conceptualisation of a subject. And or a self. The subject being person-like (a person, object or location), has both temporary and enduring components. In Lakoff and Johnson´s model it has a metaphorical existence independent of the self i.e. parts of the person in question not picked up by the subject; a body or bodies, social roles, past states and or actions (Lakoff & Johnson, 2005).

George Lakoff and Andrew Johnson have continued their work by refining their formulation of system of metaphorical conceptions of our internal self (Lakoff and Johnson, 2005). These metaphorical conceptions are all special cases of their general subject-self metaphor in which the subject is visualised as a mapping of a source domain onto a target domain. Their models for conceptualising our inner selves account for or cover five kinds (at least) of experiences; The conception for each special case (kind of experience) is a narrowing down of the source domain and a augmentation of the target domain of the general subject-self metaphor.

At first glance, Lakoff and Johnson´s metaphors seem to ”make sense” since they are based on research on how we normally conceptualise our inner lives. The general subject-self metaphor - as well as the special cases and conceptualisation highlighted - seem to indicate some kind of fluidity in relationships between persons and bodies, and that in its turn would allow for the different kinds of immersion our research questions refer to.

If one conceptualises the first person-subjective mental experience as the subject and the lived, enacted body as the self, then according to the subject-self general metaphor and its special cases, we can indeed become other people, share bodies with others, experience their enacted engagement with the world and augment our subjective mental experiences in order to accommodate their first-hand subjective mental experience of the world.

There are two dual metaphors for self control (or agency). In both control is indicated by the subject and the self being in the same place: they are being in possession of the self and being located where the self is (Lakoff and Johnson, 2005). The question of what constitutes a place and when things are together is not altogether clear: is close proximity sufficient, do the subject and the self have to be in contact? Or do they need to be mapped onto each other in different planes or dimensions? Furthermore, any credible statement about the results of this investigation into the research questions would require an in-depth discussion

about conceptions of the relationship between the self and the other, a discussion which is beyond the scope of this thesis. Also, the possibility of augmentation of the subject by the self has not been explored in detail, and this discussion may be necessary to narrow down further the research questions into specific questions that can be investigated independently (Ritchey, 2005).

Hence the findings from course seem to support embodiment theory's model of our metaphorical conception of relations between various subjects and selves.

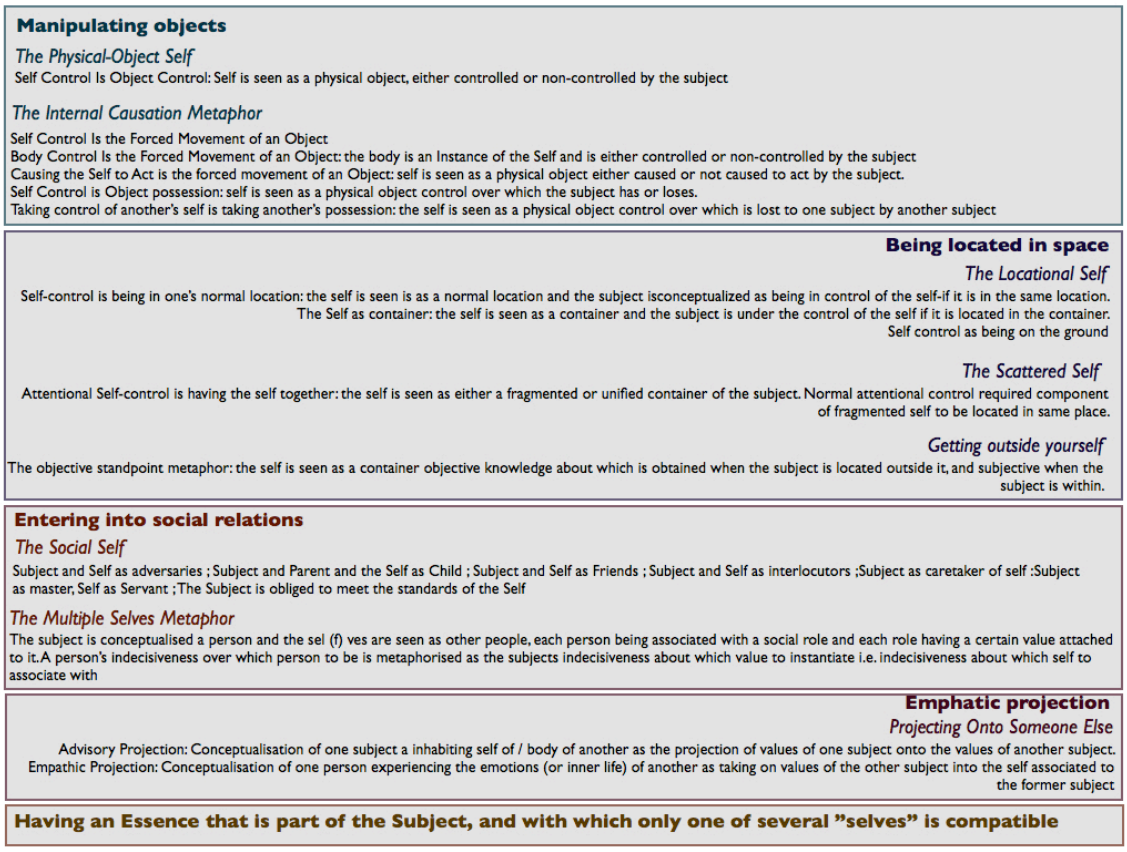

Fig 4. Summary of Lakoff & Johnson´s General Subject-Self Metaphor. Source: author.

Findings from the course: simultaneous multiple immersions is possible

One of the aims of module 2 was to immerse students in a responsive physical environment containing various elements perceived as "real" and/or "virtual". We had no access to a highly advanced virtual reality equipment to create an immersive virtual reality environment so I decided any missing technology would have to be substituted by creative ways of stimulating the students imagination. Students were introduced to, and allowed to experiment with, Bertrand Gondouin´s responsive video software, "Scramble"[9]. The exposure to many examples of what could be done with this technology, and the possibility to test new interfaces hands on, gave rise to questions about what new things can be done with technology in general. Specific questions include whether the brain´s biology is augmented by

[9] Information about Scramble software: http://www.bertrandgondouin.net/post/Scramble

new experiences and whether this could be used to augment our perception of reality and not just to suspend our disbelief in a artificially generated environment. Several of the students blog submissions from the day of the exercise brought up topics or questions related to making personal subjective experiences accessible to others. Another prominent topic was that of having multiple simultaneous experiences of the the same context in the form of intensive discussions about lucid dreaming and techniques employed by surrealist artists:

> *”To re-create dreams / sensations of dreams, visualize. Physical and material meets virtuality. What happens in the meeting between the realms? Matti Kallioinen - "The beautiful robot". Feelings and virtuality small. You'll get used to these synthetic tastes. Visualizing dreams, transfer and sharing in virtual worlds on the web.”*

> *”Talk about dreams. Dreams and the state between dream and reality. When you are in a dream and talking to someone who is awake, then you are in two worlds simultaneously. But what is real?”*

Simultaneous multiple immersions in the literature

The case for Mental Imagery

For simultaneous multiple immersion to be possible, a necessary - but nor sufficient - condition is that immersion in a first person perspective other than the default one is possible. In other words, simultaneous multiple immersion is dependent on the possibility to share mental imagery.

Mental imagery (MI) are the processes that enable us to combine memories and cognitive abilities, visualise action-alternatives that have not yet occurred, investigate memories of people and places and analyse problems with the method of visual rotation. The English language supplies a range of idiomatic ways of referring to visual mental imagery:” visualising”, “seeing in the mind's eye”, “having a picture in one's head”. The use of the terms “imagery” and “visualise” implies that the processes and sensations involved are limited to the visual modality. I have placed emphasis on the visual aspects of mental imagery, due to time constraints, but the processes described are not solely relevant to visual experience.

The research on mental imagery has undergone a significant change during the last three decades, due to developments in the fields of cognitive neuroscience. Imaging techniques like magnetic resonance imaging (MRI), positron emission tomography (PET), and functional magnetic resonance imaging (FMRI) have made MI one of the most dynamic fields of neuroscience, alongside human-computer interaction (HCI), which to a large extent deals with the same problems: visualising abstract matter (Kosslyn et al., 2006).

Paivio showed that humans more easily could recall visual than non-visual material (Paivio, 1986). Segal et al. demonstrated that mental imagery is closely connected to the perceptual modality: imagery to vision, for instance (Segal, 1972). Shephard et al. proved that images act as surrogate objects during reasoning (Shephard, 1978). The difficulties in characterising the way images are represented and processed have set the stage for the last ten years of research.

Representations and Perspectives

The use of the term "representation" in a HCI context is often based on our being on the outside of a system, and the purpose is to allow us to understand how the system works; the frame of reference of the representation being the domain. This kind of intentionality in approach and terminology, pre-empts referentially transparent contexts, although allowance is made for representations themselves as having referentially opaque contexts (Janlert, 2006)[10]. In other words representations are considered to be "about" something else, and how they are related to that something else is as diverse and personal as are our identities, dreams and aspirations. How they are about this something else is in this kind of literature of less importance. In the case at hand, the visual data presented does not have a directedness to objects, seeing as the representation is that "something else" in and of itself.

In the case of generation of knowledge based on the cognition of data in the visual modality it is more relevant to examine the possibility of the references themselves having referentially transparent contexts. Perhaps making use of the neuro-physiological functional dynamics and peculiarities of cognition that give rise to object recognition in the visual modality can do this. This is where one lands head-on into an ongoing debate in psychology; the discussion regarding the relation between perception and mental imagery, at the centre of which lies the question of whether imagery uses the same "neural machinery" as does perception (Janlert, 2006).

The Mechanisms of Mental Imagery

Many hypotheses concerning the organisation of semantic knowledge can be conceptualised as either organisation by category membership, or on the basis of object properties. "A category-based hypothesis proposes that semantic knowledge is organised according to our categories of the world [...]a property-based hypothesis is that semantic knowledge is organised according to the objects properties. These properties may be visual or functional" (Gazzaniga et al., 2002).

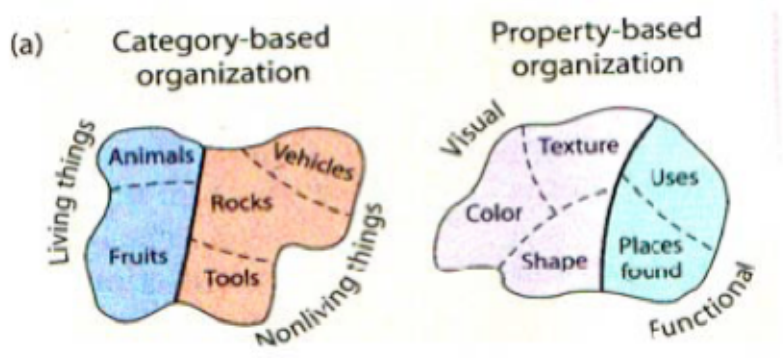

Fig. 5 - Category-based and property-based organisation models (Gazzaniga et al., 2002).

[10] Available information —
preparatory note for a theory of information space Abstract PDF Lars-Erik Janlert

Alternatively: "The frame problem: freedom or stability? With pictures we can have both"
Source Ablex Theoretical Issues In Cognitive Science Series archive
The robot's dilemma revisited: the frame problem in artificial intelligence book contents
Pages: 35 - 48 Year of Publication: 1996 ISBN:1-56750-143-5 Author Lars-Erik Janlert

For example, there may be distinct representational systems for living and non-living things (category-based), and that descriptions of non-living things are more likely to entail kinaesthetic and motor representations (object-property based) are versions of these views. Martha Farah and Jay McClelland used a study, based on a series of computer simulations, to contrast these two ways of conceptualising the organisation of semantic memory:

> *"The architecture of their model involved a simple connectionist network, designed to simulate performance when people are asked to associate names for objects with visual representations of the objects. As with standard connectionist networks, information was distributed across a number of processing units. The set of units corresponded to peripheral input systems, divided into a verbal and visual system. Each of these was composed of twenty-four input units. The visual representation of an object involved a unique pattern of activation across the twenty-four visual units. Similarly, the name of an object involved a unique pattern of activation across the twenty-four verbal units. In the simulations, the model was presented with twenty unique patterns representing twenty unique objects, half of them living objects and the other half non-living… (The model was trained to link the verbal and visual representations of this set of twenty objects) Note that the verbal and visual units were not directly linked but can only interact by way of their connections with the semantic system." (Gazzaniga et al., 2002)*

Based on the study outlined above, Farah and McClelland also proposed an alternative connectionist model of a property-based semantic system in which activation for any object (percept- to perception mapping) is in fact an unique pattern involving two disparate peripheral input systems and a third semantic system linking them:

> *"The initial activation for each object is represented by a unique pattern of activation in two input systems and the semantic system…the final activation would be determined by the initial pattern and the connection weights between the units. There are no connections between the two input systems." (Gazzaniga et al., 2002)*

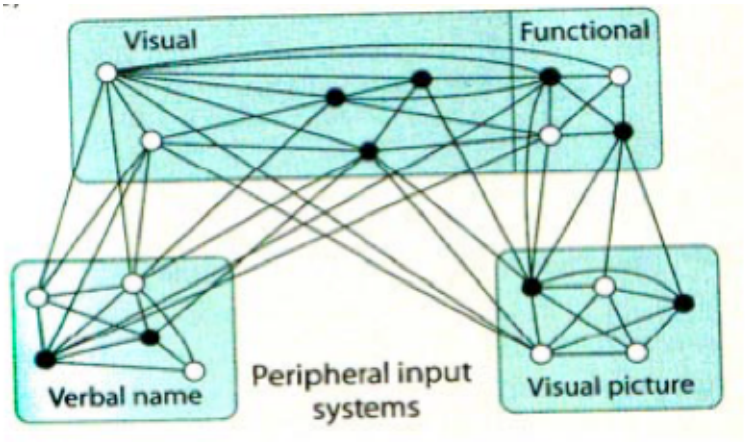

Fig. 6 - Farah and MClellands´s connectionist model. A property-based semantic system. (Gazzaniga et. al, 2002)

Paivo proposes that the human mind operates with two distinct classes of mental representation (or "codes"), verbal representations and mental images, and that human memory thus comprises two functionally independent systems or stores, verbal memory and image memory. Imagery potentates recall of verbal material because when a word evokes an associated image (either spontaneously, or through deliberate effort) two separate but linked memory traces are laid down, one in each of the memory stores. The laboratory evidence favouring the theory goes well beyond the original context of verbal learning experiments, however. For example, it is claimed that it finds experimental support in studies of memory for pictures (Richardson, 1980) and in chronometric studies of mental comparisons of sizes, distances and other dimensions of variation. Perhaps the most direct experimental support comes from work on the so-called selective interference effect, which occurs when a person tries simultaneously to do two mental tasks both of which call for manipulation of representations from the same code (i.e., two verbal tasks, or two imagery/visual-spatial tasks). In such circumstances, experimental subjects perform measurably more poorly (i.e., slower and/or with more errors) than they do when attempting either task together with one that calls upon the other code (i.e., a verbal and a simultaneous imagery/visual-spatial task) (De Beni & Moè, 2003).

Provided one interprets the imagery code primarily as a system for the representation of shape and spatial and spatial-temporal relationships (rather than as specialised for encoding purely visual properties such as colour or brightness) these results find a very natural interpretation in dual coding terms: two tasks that use the same code interfere strongly with one another because they call upon the same representational and processing resources. (Paivio, 1986)

Thus, by the mid 1970s a very different form of common coding theory had become prevalent. Computationally oriented psychologists began to think of memories as being stored as what they called "propositional representations", or just "propositions". The idea that thinking is computation-or formal manipulations of representations- is one of the pillars of cognitive science as was described by Hobbes:

> *"When a man reasoneth, he does nothing else but conceives a sum total, from addition of parcels; or conceives a remainder; from subtraction of one sum from another…These operations are not incident to numbers only…the geometricians teach the same in lines…the logicians teach the same in consequence of words…" (Hobbes, 1651 reprinted 1998)*

This suggests that cognitive processes dealing with visual data relevant to generating knowledge follow this linear progression. Object recognition, for example, does involve linking features to form a coherent whole, and may involve hierarchical representations in which each successive stage adds more complexity. Features such as lines can be combined into edges, corners and intersections, which in turn are grouped into parts, and the parts into objects." The brain, however, operates by parallel distributed processing (Rumelhart et al., 1986).

It is arguable that the modern, computational and "propositional," common coding view of memory is more theoretically parsimonious than dual coding theory, and certainly it coheres more readily with the broadly computational conception to the mind that remains dominant in cognitive science. Its supporters, however, insist that dual coding theory has the advantage of being able to account for a broad range of empirical evidence.

The Dynamics of Mental Imagery

There is a vast body of research describing the dynamics of visual perception. How mental images are created is as of yet very much open to debate:

> *"Is there more than one method whereby people can generate visual mental images? Participants generated images after learning patterns in two ways. In one condition they memorized descriptions of how segments are arranged to form patterns; in another, they memorized segments and mentally amalgamated them into patterns. In both conditions, identical stimuli cued them to form images while brain activation was monitored using PET. Comparison of the two imagery conditions revealed different activation between hemispheres when images were formed from stored verbal descriptions. Thus, images can be generated in at least two ways" (Kosslyn at al., 2005).*

Regardless of how many ways there is in which mental images are created; it is possible to deconstruct imaging into various sub-processes such as image generation, image inspection and image transformation (Kosslyn et al., 1995).

Image Generation

Image generation can be defined as the process of creating an image on the basis of stored information. These processes must access information stored in long-term memory and create a temporary short-term memory representation, which for visual images produces experience of ´seeing with the mind's eye´:

> *"Logically, images can arise in only two ways: First, sensory input can be retained (over the course of a few seconds, not simply a fraction of a second): second, information stored in long-term memory can be activated. Most imagery appears to arise when information in long-term memory is activated. Indeed, many images are novel combinations of objects or characteristics that were encoded at different times and places. For example, most people can visualize their favorite politician riding a donkey, and report whether he or she could see over the top of the animal's head-even though such a scene was never witnessed (Kosslyn et al., 2004).*

There is evidence that the spatial relations among parts of a scene are stored separately from the parts themselves. Also, Kosslyn distinguishes between categorical and co-ordinate spatial relation representations; categorical spatial relations representations specify an equivalence class such as ´connected to´, ´left of ´2 or´above´. It is useful to encode such general spatial relations as part of a description of a shape when precise spatial relations among parts can vary, but the general category of relations (connected to) remains constant (Kosslyn et al., 1995) . For example, the categorical relations between fingers and palm remain constant despite contortions of the hand.

Image Inspection

Image inspection can generally be defined as the processes involved in interpreting patterns in images. The overall process of generating images is constrained in part by the nature of information that is used to form the images. People typically look at several portions of an object when examining it, which implies that separate representations of parts and characteristics of objects are encoded. If a visual mental image is later to be formed, the stored parts and characteristics must be

properly amalgamated (Kosslyn et al., 2005)). Several studies have demonstrated similarities in how images and percepts are processed, amongst which the tasks developed by Roger Shephard of Stanford University to explore the dynamics of mental processing, are quite illustrative:

> *"In one task, subjects view a grid of twenty-five squares that contains either a block-letter or one that they are to imagine as a designated letter. The display is then turned off, and after a short delay the grid reappears, containing a dot in one of the squares. The subjects must decide if the dot falls on or off the previously seen (Figure 5) or imagined letter (Figure 6)." Subjects are in other words either presented a letter or have to imagine one, on a grid, and judge (in the latter case, inspect) whether a presented probe dot is on or off the seen or imagined letter. (See Figure 6). Responses are slower when the dot is near the edge of the letter and importantly, the effect is as strong in both cases i.e. the responses in the imagery [2] conditions are comparable to those when the image is an external projection." (Gazzaniga, et al. 2002)*

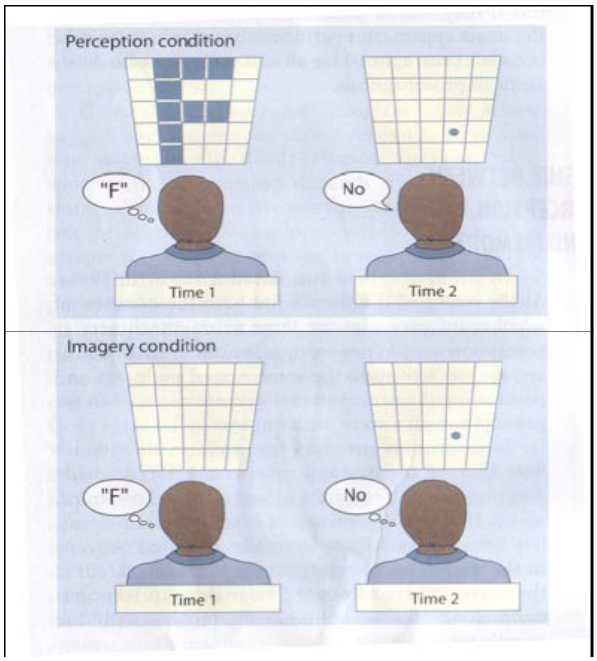

Fig. 7 - Perception and mental imagery (Gazzaniga et al., 2002).

So is it possible to share mental images?

There is evidence that mental imagery uses much of the same mechanisms as does visual perception, so to some extent, in a sense you "see" with your "eyes" the images that appear in your "mind". Does this imply that if another person where to inhabit your body, they would be able to see what you do? Can we experience what someone else is experiencing? Can we share or transfer subjective experiences? Based on reviewing cognitive neuroscience research over the past 20 years, I have not identified any obvious reasons why this wouldn´t be possible.

Is it possible to be immersed in subjective experience while maintaining reflective distance? Art vs virtual reality

While a considerable research effort has been directed towards generating and refining different aspects of immersive virtual reality, or VR (Bowman and McMahan, 2007), much of this attention has been focused on refining use of indirect light and sound effects to make the ”image” appear as the source of the real: ”In the case of virtual realities, the creator's intention is an artificial world that renders the image space a totality or at least fills the observer's entire field of vision”. In these environments the user/observer is integrated in a 360 degree space where there is unity of time and place, and is hermetically sealed off from external sensory (to some extent) impressions (Grau, 2003). Hence in VR contexts, the term ”immersion” is used when referring to the objective level of sensory fidelity a VR system provides, and depends only on the system’s rendering software and display technology. Although it is objective and measurable, it is often used interchangeably with the term ”presence” or the user’s subjective psychological response to a VR system (Bowman and McMahan, 2007). In short, the term ”immersive” in VR has been used to denote how these artificially generated environments affect perception and, to some extent, cognition.

Within art contexts, there is a clear demarcation between the real and the illusion, the illusion sometimes being constrained by a discernible frame of some sort, often symbolically staged and laden with intent or meaning, intentionally or otherwise (Grau, 2003). While contemporary computer-generated art operates within the fields of illusion and immersion, immersion in art has a different purpose:

> *”Immersion can be a mentally active process; in the majority of cases, however, both in older and contemporary art history, immersion is mental absorption in order to initiate a process, a transition. Characteristics are a diminished critical distance and emotional involvement. Aesthetic experience that requires distance or room for reflection tends to be subverted by immersive strategies”*
>
> *”As a rule, virtual realities that are primarily experienced visually seal off the observer hermetically from external visual impressions, appeal directly through the use of three dimensional objects, expand the perspective of real space into illusion space, observe scale and color correspondence, and, like the panorama, use indirect light effects to make the image appear as the source of the real. In the case of virtual realities, the creator's intention is an artificial world that renders the image space a totality or at least fills the observer's entire field of vision. Unlike, for example, a cycle of paintings representing a temporal sequence of successive images, these images integrate the observer in a 360° space of illusion, or immersion, where there is unity of time and place. Image media can also be described in terms of how they intervene in perception, how they perception and cognition; in this respect virtual immersive spaces must be classed as extreme variants of image media, which, because they represent a totality, offer an alternative reality. On the one hand, they meet the demands of the media-makers for a symbolic form of an all-embracing image experience, which admits no contradictions or alternatives, and on the other hand, they offer the observers—again because of their totality— the option of sensual and awareness-altering fusion with the image medium. This represents a huge difference to, for example, non-hermetic «trompe-l'oeil» illusionistic painting where it is easy to recognize the medium utilized, or to images and image spaces constrained by a frame, such as theatre, to a certain degree the*

diorama, and particularly television. Within the limits or framework of their form, these image media symbolically stage the aspect of difference. They leave the observer outside and are thus not suitable for presenting virtual realities in a way that deceives and overwhelms the senses. ” (Grau, 2003)

To summarise:

- There is a correlation between presence and immersion and that a more immersive environment can lead to higher level of presence.
- Affectivity is tied to the tactile-kinaesthetic body: emotion and motion are dynamically congruent..
- Presence and gaze (first person perspective) are intricately linked with immersion, both at diegetic and non-diegetic levels. .
- Various accounts of the self have and do coexist
- Even a cursory Google-search will reveal a keen interest in agency in immersive experience contexts.

Despite this, most of the studies and research I reviewed seemed to assume that the role of technology in the contexts relevant to this thesis has been to investigate how to offer us experiences in novel worlds. Is it not time to ask if and how technology can offer novel experiences in and of selves in a world?

Findings from the course: enactment leads to immersion

Next I suggested that we simulate a Second Life interaction by enacting it: that we ”play Second Life” and that each student would enact their Second Life avatar, in a real-life physical environment. All the students responded positively to the suggestion, springing into activity without needing further instruction. It was interesting to observe their communication with one another in helping one another to make masks and other ”props”: they all seemed to interpret the instructions the same way as have similar ideas on how to go about the exercise. Watching them perform the exercise in the most crowded space on the Konstfack Campus, during the lunch-hour rush, I was struck by how completely engaged they seemed to be in their game; after a few minutes it was as they were completely unaware of their surroundings and anyone not ”playing” with them. I myself was deeply engaged in watching them, and when the activity finally stopped (because the camera battery gave out) I was surprised to see that this had been going on for well over 30 minutes. Up until this point the students had been sparse in their comments in spite of my repeated requests to be descriptive in their daily blogs and documented material. The volume of submitted material increased significantly after the exercise. Two students remarked during a later discussion that they had been engaged in this exercise a way they had not experienced since childhood, with several of the other students nodding their heads in agreement.

The students in Masters and Slaves repeated their avatars’ movements in an attempt to adopt their identities, which was oddly circular since their avatars were designed based on the students themselves. There was no suspension of disbelief, and yet there was total engagement. The Second Life enactment in the course, in a way, challenges the whole idea behind virtual reality: students knew what was real and what wasn’t, but still had new experiences.

One student remarked that while he knew what was and wasn´t real during the Second Life enactment he was completely "present in the situation". He contrasted this experience with examples of suspension of disbelief in daily life where he would convince himself that he would manage to do something in an unrealistically small amount of time: "you know that this isn't the case but you convince yourself anyhow."

Students reported a definite difference between the physical experience of playing Second Life and using the Second Life environment in the traditional sense. The enacted scene felt more "real", and students felt a very real sense of constriction or limitation on which actions were possible, which in turn affected their behaviour. They remarked on not thinking about anything outside the game. Also, they remarked on how when they actually tried to get their avatars to dodge or get around obstacles in Second Life, they found that they did the required movement with their physical bodies just before doing it in Second Life.

This exercise gave rise to a multitude of observations concerned with relationships between imagination, behaviour and inner experiences such as reality sense and presence. All students seemed to agree with one student´s observation that their "becoming their avatar" had one main consequence; the experienced sense of constriction on which actions were "possible" affected their behaviour and interaction with one another

Enactment as a gateway to immersion in the literature

We know that immersion and presence are linked. We know that being in a self involves immersion. And we need a mechanism to transcend immersions, and that this mechanism would have to have something to do with embodied action. The findings from the course indicate that suspension of disbelief through illusion is not necessary for achieving immersion or engagement. They also indicate that the degree of immersion is not a function of how realistic the simulation is. What is the link between sense of body and immersion? Is it possible that we can change immersion by augmenting or changing sense of body? Can we change our sense of body by acting differently? Can we change our sense of body through communication with others? Can we subjectively become someone by enacting them?

Body talk: discussing the body

When discussing the body and communication it is important to distinguish between talk about the body, talk of the body and talk from the body. To talk about the body is to discuss the body as a cultural object. The other two refer to discussing the body as a phenomenological realm of subjective experience and as dynamically embodied action in semantically rich spaces. This discussion includes understanding of *techniques du corps* or "ways in which from society [people] know how to use their bodies". In this sense body movement is seen as the dynamically embodied signifying practice of a human agent.

Taking body movement or behaviour to be a dynamically embodied signifying practice of a human agent implies that acting is employment of an embodied intentionality to act that is embedded in inter-subjective practices. These embodied signifying acts generate large amounts of embodied knowledge systemised in different ways. These acts are also constitutive of human subjectivity and of human inter-subjective domains. Dualistic accounts of discursive and practical consciousness have proved to be unhelpful in understanding the range and

complexity of human action. The current position is that dynamically embodied signifying acts are the dialogical, inter-subjective means by which persons, social institutions, and cultural knowledge are socially constructed, historically transmitted, and revised and so become constitutive of culture and self. In a sense, what you do is what you are. Is it not reasonable to ask if what you can influence who you become by through what you do?

> *"Our bodily experience of movement is not a particular case of knowledge; it provides us with a way of access to the world and the object" (Loke et al., 2007)*

Further, movement is considered to be a constituent of perception, and thus movements cannot be considered incidental to action. The recognition that facilitation or containment of certain actions implicitly directs user behaviour has led to an awareness that the structure in physical interaction systems lies as much in the physical actions that the users perform, as in the software. There is evidence suggesting that distinctions between emotional states or expression may be made on the basis of differences in movement. Giddens (1984) pointed out that the next major problem for social theory is how to connect saying with doing, a problem which may be succeeded by another problem, that of connecting doing or acting with being (loke et al., 2007).

Up until the 1980s our historical attempts towards investigating embodied action were dominated by the observationist perspective on action. After that date which agentic perspective became prevalent instead. The agentic perspective paved the way for research on deixis, indexicality, performativity, spacial orientation and spacial contexts, semasiology, as well as kinemic and kinetic movement patterns. One cannot help wonder whether exploration of action signs as embodied corporeal memory accessed by transcendence of the individual ego is going to come next (Loke et al., 2007).

On mask and movement: the lived body and the self

Neuroscience tells us that there is no separation between self input and world input: although they are received and processed initially by separate neural orders, the resultant blending in the mind implies that the consciousness of self and consciousness of the world are contents of one and the same object of consciousness

As enlightening as Antonio Damasio's account of human consciousness and subjectivity may be, its usefulness as a basis for experimental work and novel insights on interaction or interface design is being challenged. As Julie Reiser (2007) points out, his interpretation does not get around Plato´s problem of literary representation. How do we get around using symbolic representation or verbal discourse in designing systems for human-human communication and interaction?

A similar question is addressed by Einat Bar-On Cohen as he analysis karate, a Japanese martial art originating from the island of Ikawa and modernised into its current form during the 18th century:

> *"Karate is a culturally transmitted practice without any text, discourse or verbal exegesis between and among teachers and students. The meaning of the teacher´s words, the ways in which an exercise is carried out, and ultimately karate itself, emerge from within an individual´s body. But how can the body, perceived and operated as it is from within, be culturally transmitted? How can internal somatic experiences originate from without? How can the words and body of one*

person be embodied in another? And how can adults learn foreign (for Westerners, at least) and intricate ways of using, understanding and constituting their bodies through non-verbal, non-symbolic and non-dualistic means? More generally, how is the body objectified, and what are its relations with words, specifically with those words I call ´somatic codes´- words hanging, so to speak, on somatic experience?" (Bar-On Cohen, 2006)

Cohen describes *Kime*, a Japanese term currently with no English equivalent, as a tactile-kinesthetic entity that in spite of being entirely embodied, can only be operated and recognised inter-subjectively. He shows how somatic non-dual understanding comes to form a world of meaning directly through the moving body which, even while interacting with and contributing towards the shaping of its immediate environment, continuously "shapes itself within itself." Cohen claims that somatic codes are words used for concise communication between teachers and students, that are meaningless at first, and gradually loaded with significance. He proposes that the meaning of these words, somatic codes, shift as the student's understanding of them is modified through somatic experience, as they supposedly verbalise interior body dynamics. Moreover, he proposes that somatic codes designate ambiguous things and notions and "are both on and within the "horizon-of-being" and exemplifies this in his description of the term *kime*: "*Kime*, as an example of a somatic code, is not located in any certain part of the body; it emerges from a place un-recognisable by the person who is that body. It emergence depends on interaction, and it is also a tool of interaction, a social instrument that can be put to use inter-subjectively" (Bar-On Cohen, 2006).

Philosophers Suzanne Langer and Maxine Sheets-Johnstone have drawn attention to the relevance of exploring non-discursive modes of bodily knowledge (Langer, 1953), stating that it is their somatic potentialitites that turn into sources of agency and communication, and that these potentialities are made of kinesthetics and intimately related to bodily movement:

"(To) have meaning is not necessarily to refer and neither is it necessarily to have a verbal label. Movement-animation can be in and of itself meaningful" (Sheets-Johnstone,1999)

Damasio conceptualises of our subjective self as evolving as a result of weaving an autobiographical narrative based on the experiences of the world via one particular body, and that who we become is directly related to what we do (including how we do it) (Reiser, 2007). If we consider that the so called ego can be conceptualised as being a precipitate of the body´s way of being in the world, then perhaps the interface can be conceptualised as something which offers us new potentialities of perception, the purpose of this being to giving rise to or mediate experiences of change in our bodies, and in our subject-selves. Bar-On Cohen argues that it is insufficient to see the body as being made up of what it learns to do, and that our becoming someone or something else, requires more of us to indulge in discursive ways of making sense of immersion and "sense of self" (Bar-On Cohen, 2006).

On being and acting: the self and agency

The metaphorical conception of our inner lives presented earlier, allows for the existence of subjects independent of sel(f)ves. This understanding of our inner lives, may allow us to entertain the thought of the subject as having or being in control of many selves or and or vice-versa. One of the most salient points that came out of the work with my students was how they described their experiences of "becoming" their avatars as a result of restricting their physical movement patterns so that they would adhere to the ones laid out for the avatars in Second

Life. As I have already remarked, the students commented that there was a definite difference in the physical experience of playing Second Life and using the Second Life environment in the traditional sense. They stated that it felt more ”real” when they enacted the scene, that they experienced a real sense of constriction or limitation on which actions were possible, and that these restrictions affected their behaviour. One of the students commented that clothes definitely affect how one behaves, perhaps in a manner comparable to the concept of mask in improvisation theatre. They remarked on not thinking about anything outside the game while engaged. Also, they remarked on how when they actually tried to get their avatars to dodge or get around obstacles in Second Life, they found that they did the required movement with their physical bodies just before pressing the key or combination of keys that would make their avatars perform the right movement in Second Life.

Phenomenologists would place high value of actor description of their first-hand subjective mental experience, of how they ”became ”the character. However one must take into account that the creation strategies which they employ may be shaped by artistic conventions within the educational and professional contexts in which they work and the influence of which they may not be aware: ”Striving to create lifelike portrayals, actors draw heavily on culturally available images and end up reproducing existing typifications and cultural mores” (Bandelj, 2003). My students were not professional actors, and the people or subjects they were acting was based on a introduction to something new to them…they only had first hand subjective experience of it.

Investigating acting in the context of agency, is in a sense an attempt to understand the relation between visualisation and simulation of the ”self ” while bearing in mind that this practice of creation should be understood as an interplay between structuring conditions for acting and actors’ individual capacities to act, imagine, and evaluate. Acting can be understood as a social ceremony requiring an audience (White, 1992). We know that this social ceremony involves the construction of a reality between performers and receivers, a construction enabled because subjective typifications are shared between the participants in this ceremony (Berger and Luckmann, 1967). This involvement requires participants to have purposive, evaluative and intuitive agentic capacities (Emirbayer and Mische, 1998) . But how are these agentic capacities related to ” the self”? To ask this question is to ask how humans ” exist as themselves”. It is to have an interest in understanding what it is that makes humans human. Emirbayer and Mische understand agency as a ”chordial triad” with ”an iterational or habitual aspect,…projective capacity to imagine alternative posibilities,… [and] a practical-evaluative capacity to contextualize past habits and future projects within the contingencies of the moment” (Emirbayer and Mische, 1998). Danish thinker Soren Kierkegaard thought that for human existence, ”truth is subjectivity” rather than objectivity:

> *”For Soren Kierkegaard, and for the existential thinkers who came after him (including Sartre) , human beings have a specific manner of existing: in their existing they are aware of themselves as existing, human beings are not simply there, but know that they are, which make their ”being-there” something they have to realize actively. Their existence is not something simply given but something they have to shape themselves” (Verbeek, 2006).*

Even Deleuze and Guattari’s account of the self involve inter-agentic awareness, which is an inherent quality of acting in a performative sense (Deleuze and Guattari, 2005). The findings from the course, supported by the literature reviewed, indicate that acting in the performative sense, and being in the agentic sense are closely linked; that is, who you “act” and who you “are” are related to one another.

Let us now examine this connection further...

On acting and being: agency as narrativity

The possibility of one individual becoming another pre-supposes that the self is something that is constructed based on our human experiences of being in the world throughout our lifetimes and not something that we either have or don't have. Although those experiences may have different consequences and results in the different person or individual in the making, experiencing them, there are common patterns in various experiences:

> *"All subjective experiences are quantifiable only by the person experiencing them (Schuemie, et al., 2001). But, since almost all experiences arise from the interaction between a man and his environment there are common patterns in various experiences (Dewey, 1934). The investigation of these patterns in restricted environments such as 3D, interactive virtual environments (VEs), is likely to expand knowledge concerning both subjective experiences and interactive VEs." (Takatalo et al., 2007)*

Above I presented the case that there is a link between performative acting and agency or self. The question of how one becomes oneself brings us to the problem of representative experience versus first-person subjective mental experience: is it possible to avoid replacing the actual subjective mental event with some kind of representational construct? It all depends on how one conceives of or conceptualises our so-called inner lives, of how one describes a person´s constitution as a subject. There is some evidence that this is a narrative process, that who we are is in some way related to which autobiographical story we are enacting...

In "The Autobiography of Consciousness and the New Cognitive Existentialism" Julie Reiser draws parallels between personal autobiography as a literary genre and Jean-Paul Sartre and Antonio Damasio's descriptions of the person´s constitution as a subject. While the former supposedly reveals the qualitative experience of what it is like to be one particular self, the latter works on the premises that consciousness is entirely empty and entirely subjective respectively: i.e. while the literary autobiography claims to reveal the subjective mental experience of what it is like to be "someone else", Damasio and to some extent Sartre argue that this is not possible, as Sartre and Damasio conceptualize the human person as a narrative story continuously in the making (Reiser, 2007).

While our common-sense would describe a subject who experiences the world, the existentialist (as in fact Sartre was) speaks of a subject created through an experiencing of the world. This is a significant contrast to the normative notion that the subject's experience in the world is generated by consciousness or subjectivity. Sartre - as Damasio's theoretical progenitor - conceived experience as generative of consciousness or subjectivity, as a by-product of a narrative condition. Sartre's version of existentialism thus " bespeaks a version of subjectivity that is created retrospectively through the specter of a perpetually non-present self that is, nevertheless, represented as being present to its own consciousness" (Reiser, 2007). Reiser puts forth that both Sartre and Damasio advocate a bifurcated model of consciousness which views the fundamental level of consciousness (the "core" level in Damasio and the "unreflected" level in Sartre) as a bodily encounter with the world, and the secondary level (the "extended" level in Damasio and the" reflective" level in Sartre) as a self-aware order of secondary representation. Reiser finds that in Both Damasio´s and Sartre's accounts "consciousness emerges, in post facto fashion, from the transformation of subjectless bodily experience into

secondary, self-aware representation" (Reiser, 2007).

So it would seem that cognitive science and literary autobiography - and indeed any attempts to understand the subjective that either aim to do so objectively or attempt to reconstruct it through a third person perspective - are bound to fail, as they transform the object of study into something other than what it is: mental experience is bound by the first person perspective by definition and is therefore only understood from within it. In his book *The feeling of what happens: body and emotion in the making of consciousness*, Damasio claims that the person is created by its own fine-tuning of itself into retrospective conscious subjectivity by creating a bodily-based, autobiographical record of its experiences with the world. This subjectivity, or extended consciousness, is the human organism's ability to construct a coherent narrative about itself from the experiences encoded by the core-self: as generated by the core consciousness. The core consciousness is in turn a homeostatically maintained state throughout a person life span: while it is stable, it generates individual instances of the core self continuously, each instance possibly varying from the others in response to encountered stimuli (Reiser, 2007).

> *"I propose that we become conscious when the [human] organism's representation devices exhibit a specific kind of wordless knowledge—the knowledge that the organism's own state has been changed by an object—and when such knowledge occurs along with the salient representation of an object. The sense of self in the act of knowing an object is an infusion of new knowledge, continuously created within the brain as long as 'objects,' actually present or recalled, interact with the organism and cause it to change." (Damasio, 2000)*

The extended consciousness, besides encompassing the higher cognitive processes, functions and autobiographical memories, is the human organism's ability to synthesise the different instances of the core self as coded by the homeostatic representation it generates into a coherent narrative. Damasio argues that subjectivity or consciousness is a product of an organism's retrospective autobiographical representation of its experiences in the world, and that in extension we become what we do .

Reiser points out that while Damasio makes it clear that he views the body as being the source of this narrativity (and of material for it) or consciousness, Sartre characterises his own version of reflected consciousness as the effect of a story-making process, or narrativity, that seeks a body to mediate its existence in the world:

> *"Not only does he conceive himself to be the "precipitate of language", Sartre characterizes himself as a book which is concurrently inscribed into existence through the process of the writing he, himself, performs. His physical corpus is needed only insofar as it mediates his writing's existence in the world: to tell the autobiography of Jean-Paul Sartre is; ultimately, only to tell the autobiography of "the words" he has written and the temporary material body they effect. In effect, Sartre's autobiography is not so much the autobiography of the famous existentialist philosopher as it is the autobiography of his writing's instantiated and embodied subject" (Reiser, 2007) .*

Earlier on in the paper I have asked whether it is possible to augment the metaphorical subject through the self. If one adheres to Damasio's conception of consciousness, the answer seems to be positive. Recall that Masters and Slaves students claimed that moving like the characters they were portraying turned them into the characters themselves, and helped them to achieve immersion into an

augmented reality; augment or constrain the body's movements to resemble another and you have another self or body. Living and moving like someone else is likely to give rise to certain emotions and if feedback is coming in to the person enacting the other person, the person enacting the emotions is likely to experience something comparable to the emotions experiences by the subject of enactment.

On acting and being: on agency and performativity

There is a distinction between the terms being, acting and pretending that is almost tangible but difficult to verbalise when discussing immersion in or becoming someone else: it has something to do with authenticity and illusion. It is difficult to know what others are or are not experiencing based on their external behaviour and whether one´s own emotional expressions are being correctly interpreted[11]. Consider for a moment that one could at ay one time experience several contradictory emotions simultaneously, how would one know which ones one is genuinely experiencing? There is after all evidence that posed emotional expressions represent an approximation to really felt emotional expressions (Zuckerman et al., 2006; Wallbott, 1990).

Would it suffice to look at one´s reflection in the mirror, would access to ones external behaviour and appearance suffice in helping us to make the distinction? While views of relationships between behaviour, bodily expression and emotion are continuously changing, and in spite of differences in how actors or encoders will interpret the emotion labels they are given to describe an emotional states, there is evidence that body movements and postures are specific for certain emotions (Walbott, 1998).

While previous research claimed that only information about the quantity - not the quality or specificity - of emotions could be judged by bodily expression (Ekman and Friesen, 1974), it was found that emotion-specific differences between movements are largely independent from differences between different actors particular movement and posture habits in a 1998 study of Actors and actresses portrayals of a series of 16 emotional states in various scenarios (Walbott, 1998). So there is some evidence that how we feel is related to our bodily behaviour.

Further, we know that bodily expression is in some way related to personal identity in that identity can be expressed through "qualitative body movement": demeanor, character, bearing, persona, gait, cadence and gesture[12]. In a paper about the "fashioned self", Candy (2006) proposes that to dress oneself can be seen as the acts of carrying and using personal artifacts in close proximity to the body as expressions of sociality and identity . Here she argues that kinesthetic interaction between the body and everyday clothing objects can create styles of movement that affect emotions of self (and vice versa) and subsequently the assessments of identity made by spectators. She presents several examples of the affecting relationship between demeanor and artefacts that cover, adorn or augment the body and that entail choreographic patterns for public performance:

"As a version of trousers, denim jeans are strongly implicated in stance

[11] While the clear distinction between internal and external emotional expression and behaviours is not necessarily inherent in the definition of emotion or affect, I have chosen to do so in this context in order to narrow down the discussion. Also, in making the point about perceived correct expression and interpretation of the subjects emotions, I am referring to the directionality and intentionality inherent to emotional experiences: they seem to always be about and or directed towards something or someone and a rough assumption (and some reading on affective interaction) that the outcome of successful affective interaction with others would ıe others to recognise this and to react "appropriately".

and movement as they clothe the supporting, propelling limbs that join us to the ground. The classic jeans demeanor (Eco felt his jeans 'imposed' a demeanour) is manifested through the hanging or hooking of hands on to and into the pockets, or through the belt loops, which by providing resting opportunities for the hands, help to relax the shoulders and upper body. There are a number of nuanced versions of gait depending on the jeans' cut and which can relate to specific fashion cultures. Jeans' stance gives off an air of easy readiness, where casual refers to a style of clothing but also to the postural schema of its wearers, particularly in comparison to the stricter forms of body control of the past". (Candy, 2006)

Things, humans included, can be seen as bundles of possibilities for action. While Gibson is concerned with affordances or *perceivable* possibilities for action in agents, in this section I examined the feasibility of using the properties of things to give rise to different metaphysical experiences, in and through the lived body. Based on the empirical results of the course, and backed by literature review, I have paid particular attention to that which would allow us to appropriate and modify ourselves, or perhaps to "experience other selves". I have chosen to term this *internal interface design*. We know that agency, the body and performativity are intimately related. What is the link between sense of body and immersion: is it possible that we can change immersion, or selves, by augmenting our sense of body? The literature reviewed in this section suggests that this may be possible, however that this is not possible to understand through stringently scientific research. If we are to change our sense of body through communication, that communication must be in the body and of the body: a non-verbal, non-discursive one.

4. Discussion

The three findings of the course - namely, that immersion augments who we are and our perception of the world; that sharing mental imagery and even simultaneous multiple immersion are possible; and that enactment leads to immersion - have been found to be consistent, or at least not incompatible, with the literature. In particular, they seem to be consistent with embodiment theory. We now turn to a discussion of the implication of accepting these findings, and putting them into an embodiment perspective, for interface design.

Our metaphorical conception of our inner lives allows for the existence of subjects independent of sel(f)ves: a subject being person-like a person, object or location and having both temporary and enduring (the person's unchanging "essence") components and with a metaphorical existence independent of the sel(f)ves (part of the person in question not included in the term "subject", this may consist of a body or bodies, social roles, past states and/or actions) .

Lakoff and Johnson's conceptualisation of our inner lives, does to some extent allow us to entertain the thought of the subject as having or being in control of many selves. One can question the underlying assumption here: that one can understand the world based on our understanding of how we understand ourselves. We use this kind of recursive proof in mathematics and physics, estimating or predetermining the truth in order to get at the truth, and neuroscience tells us that there is no separation between self input and world input: although they are received and processed initially by separate neural orders, the resultant blending in the mind implies that the consciousness of self and consciousness of the world are contents of one and the same object of consciousness (Lakoff and Johnson, 1999).

The idea of a self inhabited - or controlled - by several subjects is intriguing, and there is some support for the feasibility of the self as being possessed by an external force. If our subjects can be projected into and out of various selves, would that not change the definition, and indeed purpose of the interface and of interaction design? In the introduction I presented the interface as being "commonly conceptualised as an embodiment or representation that allows two or more entities to interact with each other and exchange information under certain conditions and constraints." The common visualisation of this understanding of the interface as of a layer, sandwiched between two autonomous entities, each separate from the world outside itself by a clear demarcation. I then claimed that if the expectations of information exchange between entities changes, then so does the definition of the interface. If the boundaries between what is of the self and what is not changes, then perhaps it is not unreasonable to infer that this would affect expectations of information exchange between on and other selves, or others? And if these selves are housed in the same physical body, then again perhaps it is not unreasonable to entertain the possibility that this would change expectations of information exchange between "people". This in turn, would bear consequences on the practice of interaction design, and in extension on the "definition" and "purpose" of the interface.

In a sense, our external appearance, what we place on our bodies and the ways in which they move is the facility which mediates our communication with other agents; hence agents must be anyone who can see/take part of these changes in our movements, gestures and attributes. One of the most salient points that came out of the work with my students was how they experienced "becoming" their avatars on some level as a result of restricting their physical movement patterns so

that they would adhere to the ones laid out for the avatars in Second Life. Of course, it is difficult to argue the universality of such a statement, due to the matter in which this study was conducted, and perhaps the issue of establishing the universality of statements is not entirely significant in this context but rather the object of future research. One could argue that the creation strategies employed by the students as well as the communication of their first-hand mental subjective experience may have been shaped by prevalent social and artistic conventions. However, this is offset by the fact that the course was their (with the exception of one student not involved in the enactment) first exposure to the avatars they were enacting (or becoming). I have taken a phenomenologist stance in this matter in taking student descriptions of their experiences as evidence that these experiences did indeed occur in the manner in which the students described them. While this approach is quite useful in understanding the relationships between technology and how we behave in the world, it is not entirely uncontroversial as the Heideggerian phenomenological tradition of the philosophy of technology is notoriously techno-phobic and conceives of techno-science as a kind of interpretation of reality, missing techno-science´s potential for change or augmentation of reality :

> *" As the Belgian philosopher of technology Gilbert Hottois observed, the phenomenological tradition of the philosophy of technology to which Heidegger belonged is technophobic. It failed to notice the unique and radically new character of modern science and technology-, which he characterizes as "techno science"- and tried instead to shoehorn them into existing conceptual frameworks. The phenomenological tradition, or at least the work in the philosophy of technology that takes its cue from Heidegger, conceives of techno science as a particular kind of interpretation of reality, and fails to see its operativity, which makes it transcend the realm of interpretation (Hottois 1996a). The technosciences are more than interpretations of reality: they act, even encroach upon reality. We fail to understand technology adequately if we only characterize it in terms of interpretation, for this reduces it to the domain of the symbolic, which is what it precisely transcends. This is not to say that approaches such as Heidegger's should be considered entirely obsolete. On the contrary, Heidegger and Jaspers have drawn attention to an important dimension of technology; namely the, the relation between technology and the way in which human beings interpret and engage their world. That perspective, however, can be filled much better by seeking a closer contact with technology itself, which is precisely what becomes possible via an analysis of technology in terms of concrete artifacts" (Verbeek; 2005).*

Lakoff and Johnson's proof that the mind is embodied comes in the following form. A neural model of a perceptual or motor mechanism is constructed, and that same mechanism is used for conceptual tasks of two sorts: (1) learning the structure of a semantic field of lexical items so as to get the relationships among the lexical items correct and (2) performing abstract inferences. If the neural model of the perceptual or motor mechanism is altered, does it follow that the mechanism for the conceptual tasks is similarly altered? Could it be that the models for spatial-relations concepts, concepts of bodily movement and concepts indicating the structure of action or events would be affected, changing our conception of the self and of agency? It does not seem altogether far-fetched, as it is through the embodied experience of the world that these models are constructed in the first place .

The old definition of the interface as something that mediates human to human communication assumes the existence of one agency in one human, or at least that there is some sort of clear distinction between agents. In a way, we act as an external agent when assessing our character in the mirror, and while we are

performing/acting we are simultaneously assessing ourselves from a critical distance. So if we can achieve multiple simultaneous immersion, i.e. if we can be several agents sharing in a body, then could the role of the interface be likened to one of a mirror that is opaque and transparent depending on the context and situation? In relationships, our engagement in projects where the immersion involved limited illusion and a lot of reflecting the results lasted for much longer. If the viewer of a film knows it is a documentary, for example, and he knows it deals with real people, the immersion lasts longer, he ends up being more empathetic and involved with them. Perhaps then the role of the interface is one that facilitates this immersion and engagement in a manner that allows for more profound insights, facilitating a transcendence of our boundaries by aiding the self to house more than one agent. If the mind indeed is embodied, if the contents of mind are crucially shaped or given inferential content by the body, perhaps it is by shaping the body, by influencing how the body functions that one can shape the mind (Lakoff and Johnson, 1999).

As we considered acting, we have encountered a special kind of split perspective, or simultaneous double immersion: the actor, and indeed the spectator himself, are engaged in and experiencing a scene on two different levels, the immediate and the critical. Do they occur simultaneously? Can you at once be totally engaged while maintaining a critical distance necessary for reflection? German playwright Bertold Brecht developed a theory of drama which reflected his views regarding total immersion: he argued Aristotelian theatre keeps audience immersed without giving them a chance to take step back and critically think about what is happening on stage. He created several techniques called A-effects to remind audience that what was going on was a representation and to force them to think (Frasca, 2001). Another example is that of the Brazilian dramaturgist Augusto Boal who created "theatre of the oppressed" techniques. They aim to foster critical thinking and to break down the actor/spectator dichotomy by creating the "spect-actor", a new category that integrates both by giving them active participation in the play" (Frasca, 2001).

At this stage it is unclear to me if, and in that case which, contradicting metaphors can coexist and the manner in which they can do so. Further, I feel it is difficult to argue for any point without first having established how to deal with the contradictions and paradoxes that arise as a result of my ambiguity over the universal relevance of different kinds of metaphors: I am unsure as to how much weight to place on them as the basis of a critical discussion of the research questions. If one follows the line suggested by Lakoff and Johnson, the proponents of embodiment theory, in that our understanding of ourselves are based on views of our inner lives that are largely hidden from us, and internally inconsistent and incompatible with the lessons learned in cognitive science (Lakoff and Johnson, 1999), then we need to establish how to deal with contradictions and paradoxes in reflecting on and discussing them. These findings suggest that the tenets of western philosophy and rules of inference cannot be assumed to hold true in this discussion and that open ended investigation of specific phenomenon or observation is the only way of attaining any kind of working knowledge and clarity in this context.

If the self is indeed any object, body or place and if our subjective selves are a result of our embodied experience in any one or more selves; if communication and a sense of community or belonging, if a wealth of experiences and if learning and understanding are indeed fundamental to our leading engaging lives; then maybe the ultimate function of the interface is to act as a vehicle, something that helps us transcend the temporary self into other.

5. Conclusions

We know that immersion and presence are linked. We know that being in a self involves immersion. We need a mechanism to transcend immersions, and this mechanism would have to have something to do with embodied action. We know that presence and immersion are necessary ingredients. The findings from the course indicate that suspension of disbelief through illusion is not necessary for achieving immersion or engagement. The findings from the course also indicate that immersion is not a function of realistic simulation. Also two strategies to achieve immersion were identified: simulation, metaphor we can classify Platforms for interaction on metaphor vs simulation axis and further classified on single purpose (close-ended) vs general purpose (open-ended).

Analysis of student reactions to exposure to the Second Life environment - as well as to enactment of Second Life in a physical space - say our bodies influence what we become and who we are. These empirical results of the course, observations backed by literature research, seem to support embodiment theory. In exploring the link between sense of body and immersion I examined the students observation that it is possible that we can change immersion by augmenting our sense of body: Can we change our sense of body by acting differently? Can we change our sense of body through communication with others? Can we subjectively become someone else, i.e. adopt someone else's gaze, by enacting them? The course and the experiences of actors who "can't get out of the role" loosely suggest we indeed can or at least that these ideas are worth investigating. I think an interesting and engaging way of researching this further could be to do so by developing and or implementing models for different kinds of performative enactment as part of the mechanism of "inner interface" for mediating inter-self and or inter-subject transcendence. That is, to do experimental work in which the interface is framed as a vehicle for self-transcendence.

If embodiment theory is right it would follow that metaphor is better strategy than simulation for interaction and interface design work. Why? because metaphor simulates one aspect very well and the rest is not as important. The Designer focuses on aspects they are mainly interested in and not on creating a total interface ecosystem. Users are free to reinvent this platform any way they like; free enough so that users are not tempted to overrule it, to break free. By the same reasoning that follows from embodiment theory, you are respecting user and allowing them to adopt on use pattern in opting for open-endedness.

My conclusion is that interaction design should be concerned with the design of more democratic interfaces, or interfaces that allow for various relationships between multiple selves. These interfaces can be conceptualised as vehicles for inter-self and inter-subject transcendence and or interfaces that allow the user to change "gaze" or first person perspective. This conclusion is based on discussions on gaze, perspective and communication in immersive experiences, and is backed by extensive analysis of neuroscience research on mental imagery. I propose that these "internal" interfaces, should place higher emphasis on metaphors than on simulations as frameworks for designing engaging interfaces. Using metaphors allows for open-ended interface development processes as opposed to simulations that seal in the user in a preconceived role or perspective[13] (See Fig.8 below). This conclusion is based on observations of student reactions to, and evaluations of, the exposure to the Linden Labs Second Life platform as opposed to an exercise of physical enactment of Second Life.

Fig. 8 Examples of open & close ended interface design based on simulation & metaphor-frameworks.

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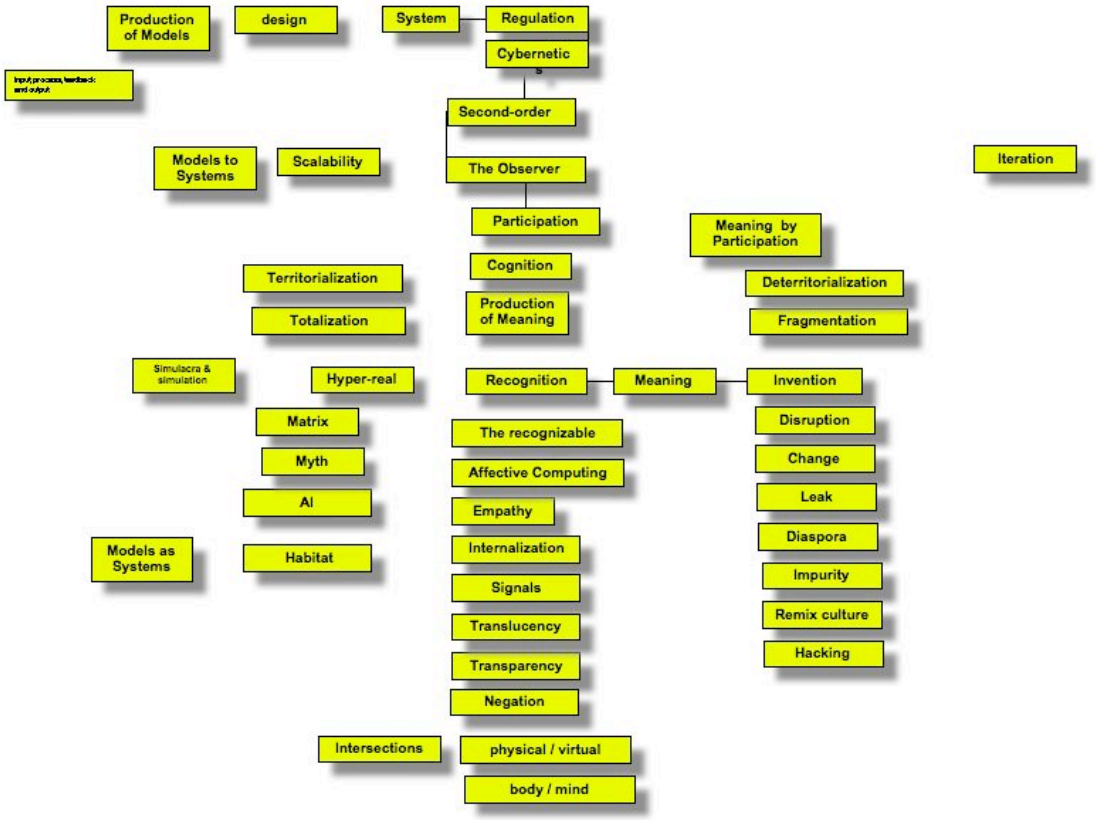
Appendix A - The Masters and Slaves Course

Context

Following several informal conversations regarding my research interests, Professor Ronald Jones approached me in April 2007 with a request to design a four-week Interdisciplinary studios course to be taught in October of the same year at Konstfack. Interdisciplinary Studios are part of the foundations education offered by the Department of Interdisciplinary Studies at Konstfack, University College of Arts, Crafts and Design. The goal of the Interdisciplinary Studios is to realise complex and innovative projects while maintaining a high level of artistic ambition. The studios are dedicated to broad themes that are relevant across disciplines and that challenge students creatively and intellectually. The studio aims to encourage critical thinking and decision making in complex and unpredictable situations in the students, requiring them to be creatively entrepreneurial an innovative in their use of technologies and artistic practices in strategic collaborations.

Background

For personal reasons, I was interested in eating disorders, and was looking at the relationship that anorectics entertain with their bodies: they seem to be trying to style themselves as masters, and their own bodies as their slaves. In fact, the body-as-slave theme seemed not to be restricted to anorectics; on the contrary, it would surface in different cultural loci, like a thread woven into cyberculture. Cyberfeminist thinkers would maintain that constantly trying to enslave their own bodies is the normal state for most women (Sanz and Burkitt, 2001); interest in cyborgs and BDSM sexual aesthetics is quite pervasive on the Net. These reflections were influenced by a course in neuropsychology I had recently attended at the Karolinska Institute in Stockholm, as well as my interests in culture and art of the Afro-Jewish diaspora in post WW1 Europe, second-order cybernetics and cyber-feminism.



By contrast, embodiment theory maintains that the distinction between the self and the body is spurious. The body has an enormous influence on determining who we become: it should not be thought as separate from the self, and therefore it can't be enslaved by the self.
Course Materials & Resources

The course was intended to expose the students to different situations, each having a different take on what ”immersion” implies. In accordance to Rosenheads's prescriptions, an ideal situation would have required the students to spend the entire three weeks in the studio. For obvious practical reasons, however, that was not possible and we were required to use two separate rooms, the studio and a computer laboratory. Both course design and course implementation placed heavy emphasis on group interaction as an important part of generating insight. Again, this is consistent with Rosenhead's recommendation to “function through group interaction and iteration rather than back office calculations” (Ritchey, 2005).

Course structure

The course was divided into three modules, each module differing from the others in approach and content. The themes were kept broad, and that implied that they would require myself and the students to integrate multiple definitions and uses of concepts. Students were expected to reflect upon the theme-related topics introduced during lectures, presentations and discussions, as well as in the work they produced during workshops, and in their final project-presentations. The general idea was to use a physical space, a studio provided by Konstfack, as a multi-modal semantic web in the making, a sort of media-wikipedia resource that

was not restricted to visual or auditory entries (Figure 100), wherein one could visualise and document reflections on abstract concepts in ways that would make them accessible to others. A lot of emphasis was placed on the students extensively documenting their reflections and work, and students were required to submit blogs and photo-documentation twice daily: once before they began the days work, and the other to be submitted before leaving the studio for the day. This insistence on documentation is consistent with Rosenhead's recommendation to "Facilitate a graphical – i.e. visual - representation for the systematic, group exploration of a solution space" (Ritchey, 2005).

Fig.10 - A multi-modal media-wikipedia resource in a physical space. Source: Screenshot from episode of Heroes.

The three modules were spread out over the duration of the course and not taught in any specific chronological order; I selected each day's activities from any of the three module-components based on the course progress and student response. The module descriptions below are based on documentation and notes composed either during or immediately after (within 24 hours) the activities had taken place. The course was attended by eight undergraduate students, three male and five female, all aged around 22-30, each one a major in one of the following subjects: glass and ceramics, graphic design, free arts, textile design, fashion design. With the exception of one student none had previously attended university prior to having enrolled at Konstfack; none had previously been exposed to Second Life.

Module 1

In this module students manipulated a virtual object not present in the same location as their own bodies. I initiated this module by giving the students an assignment in which they were expected to select a few words from a selection presented to them, and to visualise and document their reflections on how they were related with no restrictions as to use of method or media. On the next day we discussed the assignment in a documented meeting. Next, the students were introduced to the cultural and historical developments within Second Life, a

platform for massively multiplayer 3d interaction developed and run by American company Linden Labs; next, they were taught the basic technical skills of navigating, interacting and building in Second Life. The students were then left alone to explore the environment by themselves; the ensuing discussion shed light on interesting observations and questions to be investigated. Later the students were introduced to the technical and aesthetic developments of interactive video in a historical context. Group and independent meetings were held with the students to discuss their individual final project, and students were then given three days to refine their ideas before submitting a written description of what they intended to do.

Module 2

In this module students manipulated objects present in the same location as their own bodies surrounded by a responsive environment perceived to be virtual. We had no access to a highly advanced VR equipment to create an immersive virtual environment. What we did have was two walls on which images could be projected, Scramble software[1] augmented for use in conjunction with a Nintendo Wii console and an electronic dance mat.

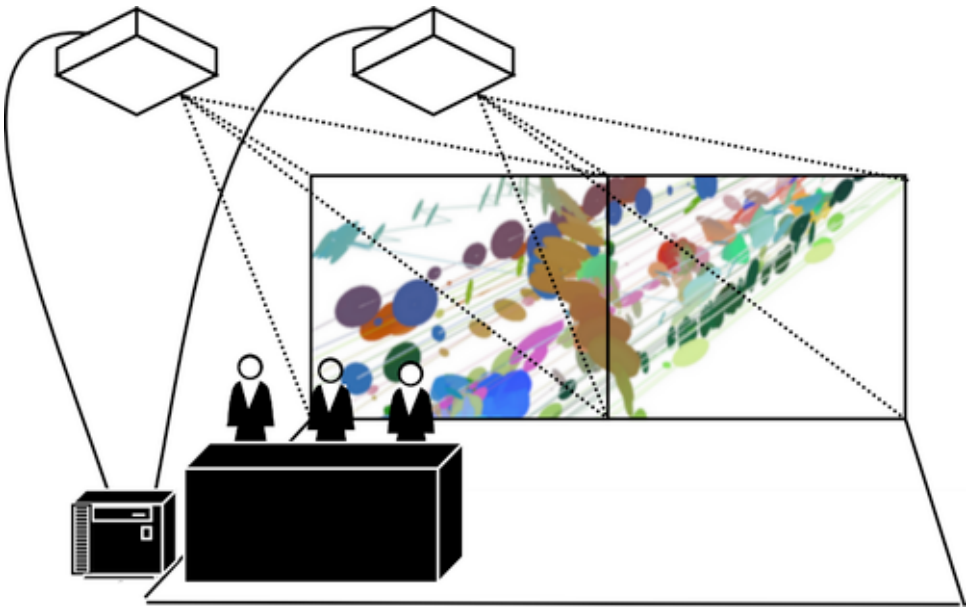


Fig. 11 - The setup for Bertrand Gonduin's "augmented Scramble" lecture in Module 2. Source: Bertrand Gondouin.

Next, I decided to try to replace immersion in a responsive virtual environment with a real-life enactment of a Second Life interaction session. I suggested that we ”play Second Life” and that students ”be” their Second Life avatars, while moving within a real-life physical environment. The idea was that we could imagine making experiences in a world in which things happened, often in response to our actions, but of which we were not part; those experiences would form the basis for subsequent discussion. We would therefore be in a kind of disconnected state similar to what is often experienced while dreaming: the people and objects around you respond to what you are doing, and yet you know that it is just a dream and they are not “real”. The event was documented, and two discussions ensued; one prior to and the other after our having reviewed the documented materials (video and photo documentation). In a peculiar way, people who did not participate in the course ended up becoming in some sense another resource for Module 2; these would move around the Konstfack venues engaging in all kinds of activities with each other, thereby providing a source of potential distraction to the students

engaged in Master and Slaves.

Module 3

In the first part[2] of this module students manipulated physical objects present in the same physical location as their bodies in the form of robotics workshops as well as workshops in which they used the recourses offered in Module 2 as media or materials.
In the second part the students worked on individual projects where they mixed and integrated elements from all three modules. Also they were given written assignments, which served two purposes: compensate for the students not having consistently followed the documentation requirements (see observations and discussion below); and help them gather and reflect upon insights gained from the course for future reference.

Appendix B- Interdisciplinary Studios at Konstfack

Interdisciplinary Studios are a part of the foundations education offered by the Department of Interdisciplinary Studies (IS) which has been designed to establish the "artistic ground" upon which Konstfack students may confidently build their future education. At the Department of Interdisciplinary Studies we assume a broad definition of art, craft, design, and media, informed by history, criticism, theory and the Liberal Arts and Sciences. Students and faculty work across disciplines here uncovering or creating relevant and innovative connections between art, design, craft, history, techniques, theory, and media. Students work individually and in groups with IS faculty as well as with distinguished visiting designers, crafts persons, researchers, artists, scholars and critics. The primary goal of every Interdisciplinary Studio is to realize complex and innovative projects while maintaining a high level of artistic ambition. These studios are designed to be creatively and intellectually engaging, broadly relevant, interdisciplinary, and comprehensive.

Interdisciplinary Studios are dedicated to themes rather than single disciples. Students learn to be creatively entrepreneurial and innovative by working collaboratively on themes that are relevant across disciplines. Working across disciplines they learn to make decisions in complex and unpredictable situations. Students develop an understanding of creativity, systematic knowledge, and critical awareness of new insights at the forefront of disciplines, fields of study, and in professional practice. They develop the ability to think critically while interpreting themes across disciplines.

In Interdisciplinary Studios students learn to be flexible anticipating innovation, rather than solve problems. What is the difference between artistic innovation and problem solving? Problem-solving works within a given paradigm to create new solutions to known problems. Artistic innovation risks working with the existent but unknown in order to discover opportunities for hybrid innovations that could not have been predicted in advance. Problem solving simply accepts the parameters of a problem given by society or a culture. The goal is then to work within those parameters until a solution to the problem is reached. Innovation works by a different, more entrepreneurial logic where, through creative and critical thinking, rigorous analysis, and risking failure, opportunities are discovered that can be exploited and transformed into innovations. Innovation is different from the Modernist idea of newness on the tabula rasa – innovation works incrementally, building on what is known, but is also capable of setting off a cascade of effects – creative, social, political – that over time have the potential to create significant change. Interdisciplinary Studios create circumstances in which those students who successfully manage risk create innovations. Finally, in Interdisciplinary Studios students learn to communicate the story of their risk taking and innovations clearly and effectively to academic and professional audiences.

In Interdisciplinary Studios students look for the unanticipated potential in new forms of collaboration, and while being open to allied disciplines, they may use new technologies and traditional artistic practices in strategic collaborations. Interdisciplinary Studios demand both innovation and plausibility, creativity, and a high degree of technical resolution.

Teaching Interdisciplinary Studios is teaching risk management in the creative disciplines.

1. Be entrepreneurial and innovative rather than solve problems

2. Make Interdisciplinary Studios a place where students can fail while learning to manage risk in order to achieve innovation.

3. Develop critical and creative knowledge from an artistic point of view and from pure and applied research.

4. At the core of every Interdisciplinary Studio should be essential, even traditional art and design knowledge (i.e. form follows function) but it should be approached from the oblique, so that the knowledge cannot be anticipated, but reveals itself to the students in unexpected ways (Read the article on Ronald Burk's theory of creativity).

5. Teach with a creative and interdisciplinary approach, encourage critical thinking and provide historical contexts

6. Teach competence in studio techniques.

7. This is a team effort; maintain a high degree of coordination between your curriculum and the other Interdisciplinary Studios faculty.

8. Have high expectations: innovation, plausibility, creativity and a high degree of technical resolution.

Nine Rules of Risk Management in the Creative Disciplines

1. There is no creative return without risk.

2. Be Transparent, risks should be fully understood by the students.

3. Seek Experience. Risk is managed and measured by people not models.

4. Know what you don't know, have students question every assumption they make.

5. Communicate. Explain that you expect students to take risk in order to manage it;they can fail in Interdisciplinary Studios and still succeed.

6. Diversify; multiple risks will produce a consistent creativity.

7. Show Discipline. With your teaching as with the student's work: a consistent and
rigorous approach with high expectations will beat a constantly changing strategy.

8. Use Common Sense. It is better to be approximately right that to be precisely wrong.

9. Creative return is only half the equation; decisions are made only by considering the risk and return of the creative possibilities.

Interdisciplinary Studios is a refinement and enhancement of the earlier IS course Open Studios. Rebuilding Open Studios as Interdisciplinary Studios is based on the success of Open Studios, but especially its failures, mindful that we learn more from failure than success. However, one of the success stories of Open Studios was the diversity of themes undertaken. A list of some of the most relevant and sophisticated themes are listed here. While complete descriptions cannot appear here, listing the titles is meant to convey a sense of the multiplicity of themes possible within Interdisciplinary Studios.

- Sound Design
- Design for Extreme Environments
- Sustainability (Partner: Myrorna)
- Hospitality and Hostility

  Indigenous Craft
- Alternative Spaces Video Activism
- Design and Miniaturization; Nanotechnology
- Drawing - Unorganised Form
- Drawing by Designing Software
- Illusions and Hoaxes
- Stealth, Speed and Pattern
- Nomadic Craft
- Robotics + Captology
- Homemade
- Sound Design and Urban Space
- The End of Me: The Copy, Virus, Sample, Clone
- Playing with Evil

Appendix C - Masters and slaves- Course outline

Institutionen för Interdisciplinära studier Kurskod

Masters and Slaves

Kursen är på grundnivå :4,5 högskolepoäng

1. Fastställande: Kursplanen för kursen Masters and Slaves, 4,5 högskolepoäng är fastställd av KU-nämnden vid Konstfack 2007-xx-xx. Kursplanen gäller från och med höstterminen 2007.

2. Valbar: Kursen är valbar.

3. Obligatorisk kurs: Kursen är inte obligatorisk.

4. Förkunskapskrav: Antagen till utbildningsprogram vid Konstfack.

5. Lärandemål: Efter avslutad kurs ska studenten ha:

Fördjupade kunskaper kring olika begrepp och föreställningar rörande kroppslighet och ägande:
*Insikt om samspel mellan formgivning och kroppslighetsbegrepp i olika miljöer
*Fördjupade kunskaper om kroppslighetens roll i förhållande till identitet och integritet
*Förmåga att kritiskt reflektera om samspel mellan kroppslighet och kommunikation i virtuella miljöer

6. Innehåll: Virtualitet och Kroppslighetsbegreppet

Olika föreställningar om och attityder kring kroppslighet har utan tvekan påverkat utvecklingar inom diverse fält där man intresserar sig för människan och hennes beteende. Vad kroppslighet infattar och innebar är långt ifrån fastställt. Vi vet dock att det pågår ett ständigt samspel mellan tanke och kropp; de kan inte betraktas som helt skilda enheter. I kursen ges en belysning av kroppslighet som ett skiftande begrepp som påverkar och påverkas av tekniska utvecklingar och deras tillämpningar. Dessutom diskuteras ägande och integritetsfrågor i förhållande till olika tolkningar av kroppslighetsbegreppet. Förutom att öka förståelsen for vikten av kroppslighet i kommunikation syftar kursen att utveckla färdigheter i formgivning för och i icke-förkroppsligade miljöer. Att kritiskt identifiera och reflektera kring relevanta frågeställningar och ställningstaganden om kroppslighet i olika sammanhang samt skapa verk utifrån dessa reflektioner.

Kursen består av föreläsningar, workshops samt projektarbete, individuell handledning och besök på aktuella utställningar.

7. Litteratur: Textkompendium delas ut vid kursstart.

Former för bedömning: Kursen examineras i projektform utifrån projektens mål och innehåll.

9. Betyg: I kursen används betygsgraderna Godkänt (G) och Underkänt (U).

Kursutvärdering: Kursvärdering ska utgå från kursens mål och innehåll. Kursutvärdering ska ingå i kursens planering och schemaläggas. Kursen ska utvärderas i anslutning till kursavslutningen. Utvärderingen ska vara skriftlig, individuell och anonym.

Appendix D -The course syllabus

Embodiment & experience in real & imaginary worlds

Open Studio Course, Konstfack Department of Interdisciplinary Studies

Nadia El-Imam, 2007

"...Förhoppningsvis har jag fel, men det känns som att vi befinner oss i en science fiction bok där folk endast vagt kommer ihåg hur det var att känna smak…"

Lisa Carver

Course Background:

As we spend more and more of our time socialising and conducting the business of our everyday lives Online, we see the rise of economies of the virtual; over the past eight years alone, Real-money trade of virtual property ('RMT') has burgeoned into a 2 Bn USD market. With the emerging visibility of new relationships and communities we see the emergence of new forms of ownership related to the accumulation of meta-data; these can be seen as attempts to obtain outwardly extending, all- encompassing ownership of information as opposed ownership of content, or enclosures of information. In order to identify and meet the challenges these developments pose to our lives in general and work in particular, we need to understand human experience in these environments. Exploring relationships between embodiment and enclosure as related to ownership is a central concern, obliging us to revisit what we know about how and what it is that distinguishes between how we function in bodied and disembodied contexts.

Motivating questions include:

What does it mean to own somebody, anybody...a body?

What does it mean to be owned?

What is it in our being that affords ownership; what is it in our bodies?

Where do we end, if at all, and where does what is outside ourselves begin?

Are the answers to the above questions any different in disembodied environments?

Course Description:

We are de-constructing idea of ownership as related to embodiment and the boundaries of integrity or "the state of being whole". This obliges us to revisit what we know about how and what it is that distinguishes between how we function in bodied and disembodied environments. With its central concern with the implications of "post human" experience and embodiment, the course finds its natural home and setting in Second Life (SL), the Linden Labs online platform, and students are expected to participate in related seminars and lectures . Students are also expected to make presentations that explore and relate the different aspects of

implementation using the Second Life platform with ones they make in a designated physical space.

Assignments:

The seminars will be based on presentations and discussions of selected reading materials. Films, guest lectures and exposure to theatre/dance performances will compliment course-work at the school.

There will be a project in which you will be expected to materialise understanding of or reflections upon course topics. This project will be composed of a set of assignments, mostly based on work-shops, which will be discussed before the following assignment/ presentation begins. An example of a workshop task may be designing a brand of artefacts for a Second Life Furry and for the Furry´s real-life equivalent. Materials will consist of a combination of media depending on the student´s disciplinary background and choice of task. The reading material will be selected chapters from books and magazines (in Swedish when available) provided as photocopies in order to complement the workshops and the presentations.

Provisional Schedule:

Week1

Course introduction- topics, reading materials & evaluation criteria

Seminars & Guest lectures

Workshop presentation: Exoticism and the other-Patterning Fetishism

Week2

Workshop-presentation: Aesthetics of Punishment

Seminars: discussion of Group presentations

Studio production initiated

Week3

Workshop-presentation: Dreaming the Escape

Studio production

Mid Review

Week4

Workshop-presentation: Building Defences and Breaking Barriers

Presentations

Students pick one of the presented projects and produce work that is in response to it.

Presentation of critique in form of projects

1. The Scramble software was introduced into Masters and Slaves during Bertrand Gonduin's guest lecture is a kind of Magic Lantern into which you can upload any kind of picture and animate it – the students fed Scramble with their own drawings, videos or photos – or started drawing from scratch in a 3D space. Scramble has its roots in film history. One of its animation effects is a remake of the Zoetrope, a pre-cinema technology. Inspired by Orson Welles, Gonduin also created a soft/deep focus effect that simulates the depth of field of the traditional camera.

2. The module is here ordered into two parts conceptually, not chronologically. Individual students projects evolved throughout the duration of the course.

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