

EVENT_FIELDS: DESIGNING A VIRTUAL SPACE

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ABSTRACT

This paper detects the gap that exists between theory and practice in the design process of virtual spaces and investigates the possibility to design a virtual online space without interpreting the word *virtual* as the fake representation of the real. A different approach of the meaning of *virtual* is used, based on the works of contemporary philosophers, in order to understand the way information technology has altered the way we perceive reality. Several cases of existing virtual worlds, along with messenger engines, have been studied in order to extract conclusions for the most common design techniques used. As a result a test space has been constructed and called Event_Fields. A main conclusion of this research was that in order to participate in the shaping of a reality, the designers involved should be in complete understanding of their tools, therefore of the interface of the design process.

The name Event Fields was inspired by the title of the book "*Being and Event*" by Alain Badiou, the French mathematician and philosopher whose work on the virtual has provided the most inspiring phrase about perceiving multiplicities: "*What is not a being is not a **being***" (Badiou, 2005) ¹. The word "*fields*" express the ambition of including the studied notions in a complete entity with a perceivable nature, while the title predisposes the emergence of unexpected events in a virtual world.

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*“What is not **a** being is not a **being**”*

Alain Badiou

1. INTRODUCTION

In order to understand the gap that exists between theory and practice in the design process of contemporary virtual spaces, this paper studies the possibilities of designing an online virtual environment, suitable for communicating and exchanging ideas, founded on the notion of *virtual* as expressed by philosophers like Gilles Deleuze and Pierre Levy, in opposition to the most popular notion of *virtual* as the fake representation of something real. The research question I will attempt to answer through the development of this paper is ***how it would be (if) possible to design a virtual space, based in the conclusions deriving from the above interpretation.***

The demo name chosen for this testing space is Event_Fields. The fundamental ambition of the researcher is not only to indulge in the theoretical aspects of such a venture but to balance between theory and practice, between the virtual and the actual designing of it, as an inseparable whole.

2. METHODOLOGY

In order to answer the research question the following method was used:

In the first part I have studied how information technology has altered the way we perceive reality, along with what is the role of the notion of the *virtual* in that case and also the way traditional notions of space have been altered by the integration of information technology in contemporary design. Notions like *limits*, *adjacency* or *mutability* along with those of *texture* or *history* have been analyzed, to define those discrete elements that have been altered in meaning or in experience through the creation of spaces by bits and not by tactile, traditional materials.

The second step included the study of existing communication and interaction interfaces, including graphical and non graphical interfaces such as Network Games, Online Communities and Instant Messengers. The aim was to trace common characteristics or specific variants that govern the designing philosophy of those spaces. Through this part of the study and with the conclusions from the first part, I have attempted to clearly separate to what extent those spaces are *virtual* as *fake* and to what extent they are *virtual* as virtual have been defined by the philosophers. Although I used a small sample of the design techniques due to the plethora of digital spaces, it soon became evident that there are rules that can be easily distinguished

as the most common ones. This analysis has helped me to clarify which of those characteristics should be reevaluated in the design procedure of the Event_Fields.

The next step included the designing of the online digital space under the name of Event_Fields. Some of the characteristics of this space derived from the conclusions of the previous study and others from the nature of the programming procedure itself. The space enabled users that log in to have online conversations and to make publication in the form of text. A graphic environment existed providing the necessary interface and platform for the users' interactions. This environment was conceived as the real time representation of the actions that take place in the online space and as the field that provided the chance for the users to interact. The space was uploaded for a demo testing for 10 days and was accessed by 30 users in total. Some have sent a brief report regarding what they expected from the program and what they thought of the overall experience, while almost none was aware of the objectives of the research. The group consisted of architects, programmers and people from other disciplines.

Finally the outcomes from their comments and from the designing procedure have been discussed in the final part of this paper in order for the final conclusions to be extracted.

3. BACKGROUND AND LITERATURE REVIEW

The issue of the *virtual* as a term of philosophical analysis and creativity motive has been directly or indirectly explored by different authors. The main approaches that have been studied in this paper are those of Pierre Levy, through his interpretations and studies of the work of Gilles Deleuze. The texts from Antoine Picon, whose studies as an engineer, architect, and historian of science and art provided accurate information on the past and present of the *virtual*, have also been helpful to this task. The way that Henri Bergson approached *complexity* and the *virtual* have been explored by Gilles Deleuze and have provided an inspiring framework which helped the researcher to re-evaluate the extensions of *virtual* in the designing process. In addition the work of G. W. Leibniz, one of the most important mathematicians and philosophers of history, has been an immense influence on the contemporary way of design thinking.

Along with the above, of great help was the consultation of the experienced historical view of Manuel Castells: a studious mind that approaches complexity as a beneficiary state of multiple opportunities instead of trying to lower it to a countable quantity of discrete elements by indulging in a structuralistic technique. Juxtaposing examples from different societies and contradicting cultures has provided a prolific source of informations and inspiration, of the different notions that were studied in this paper.

In addition to the previous authors, numerous others with distinguished work and research on matters about the notions of virtual and information technology have been referenced and consulted like Dimitris Papalexopoulos, William Mitchell, Nicholas Negroponte, Derrick de Kerckhove, Malcom Mc Cullough and numerous others. Information about the history and the technical along with the conceptual foundations of internet have been extracted from the work of Janet Abbate while fundamental inspiration about the communication has been inspired by the texts of Ignasio Ramonet.

The necessary information relevant to the design procedures and the function of existing online virtual spaces has been gathered by the participation of the researcher in multiple online communities, chatting rooms, network games and virtual worlds throughout numerous years. From the everyday tools of necessary communication, such as real-time messengers, to the occasional entertainment realities of the online network games, those fundamentally interaction tools have provided the researcher with rich and multilateral information. Those tools have not been studied opposite of the tactile physical reality, or as being good or evil, but they have been considered as inner and impartible extensions of the human expression.

As stated above it was of immense importance to manage and study the proposed designed spaces and the theories governing them as a whole. This is multiplicity that doesn't exclude or include, but rather behaves as a continuous entity with different intensities and qualities, such that is impossible in result to subtract the one or another: a *rhizome*² (Deleuze & Guattari, 1988) rather than a *root*.

PART I

4. STUDYING THE WAY TRADITIONAL NOTIONS OF SPACE HAVE BEEN ALTERED THROUGH THE INTEGRATION OF INFORMATION TECHNOLOGY IN THE DESIGN PROCESS

“Since we cannot change reality, let us change the eyes which see reality.”

Nikos Kazantzakis

4.1 What is the *virtual*?

In his book *“Qu’est-ce que le virtuelle”* about the notion of virtual and virtuality, Pierre Levy (Levy, 1999)³, points out that the word *virtual* roots back to the Latin word *virtualis*, which comes from the word *virtus*, meaning power or force. The *virtual* tends to be activated without yet having achieved a final form of particularization. Thus the *virtual* is not opposed to the *real*, but is simply one way of *being*. In the common language the word *virtual* is used to define the absence of existence, while the word *real* is used to declare the presence here and now. This leads to the faulty conclusion that the *virtual* and the *virtuality* refer to something fake and, particularly in design, to something that only represents something else.

In addition it would be useful to distinguish the *virtual* from the *possible*; a difference first noticed by Gilles Deleuze in his book *“Différence et Répétition”*. According to Levy (Levy, 1999)⁴, the *possible* is already completely constructed, but waits to be realized. It will start to exist without changing from its predefined rules or its nature. In result the *possible* is the same as the *real* while the only thing missing is the *existence*. On the other hand the *virtual*, which is not static and pre-constructed like the *possible*. The virtual is in dialogue with the *actual*. The virtual, according to the author, must be perceived as *“the knot of tendencies or forces that accompanies a situation, event, object, or entity, and which invokes a process of resolution: actualization.”* (Levy, 1999)⁵ The example provided in order to understand the meaning of the notions is that of the seed and the tree. The seed seems to include the tree and it knows that the tree will grow, although the seed cannot predict the exact shape of the final tree. The final result will emerge from the constant interaction of the seed with the different factors that effect the growth of the tree, like the environmental conditions or the substances of the ground. Therefore the seed has to invent the tree, to produce it, with cooperation with the multiple circumstances. It becomes clear that the *virtual* creates and at the same time *is* the tree itself. Of

immense importance then is the act of *actualization* as the act of inventing a form by activating any different steps of the multiple nodes from a virtually complete network of nodes.

The same notions are dealt in Castells' way of approaching the notion of the virtual. In order to explain and study one of his most popular notions, that of the "*Space of Flows*" (Castells, 2000)⁶, he points out that the new space where a globalized elite works, along with the numerous networked realities of the internet, provide a ground of thinking that is different from that of the traditional tactile physical space. The establishment of those new spaces and the interactive logic that traverses them creates and supports a culture of "*real virtuality*". This is a culture that allows us to perceive reality as a constantly virtual procedure, a reality that seems, according to Castells, to have been always virtual, as the understanding of objects was never strictly limited to their semantic substance. This is a reality that carries a new form of space defined as the "*Space of Flows*". According to Castells the resulting space of flows is not a concrete and defined area of actions but the resulting space of interactions among users and their actions.

4.2 Information technology revolution and the transition from a worker to a creator

The above interpretation of the *virtual* is widely expressed in the way that Information Technology interconnects space, especially through the internet infrastructure, where manipulation of information leads to only ephemeral forms resulting from the interaction of users. In 1946 Sigfried Giedion described *time* as the fourth dimension of architecture along with those of the Cartesian coordinates. By the end of the previous century, information was added as the fifth dimension, transforming once again the way architects and users perceive and utilize the architectural creation. The different types of information are the information that coexist in the memory of architecture and directly effects design, the information from the environment (as standard external references), the information that is produced during the design and construction and the information that is created throughout the lifetime of the building. These all offer new possibilities for understanding and manipulating the attributes of space. (Schmitt, 1999)⁷

In his book "*The Rise of the Network Society*", Manuel Castells begins with a flashback and some analysis on the development of the technologies that led to the

emergence of an interconnected world and set the foundation for the support of a globalized reality. Through his analysis he presents the inventions of the first and second phases of the Industrial Revolution, from the discovery of steam engine that led to the replacement of working force with machines, to the revelation of electric power that provided the telegraph and telephone. Those historical changes led to the modern reality of the evolution of information technologies, where the storage and transmission of an immense volume of data is an everyday reality. It is obvious that all the previous revolutions, like the industrial revolution, had the manipulation of information as an internal component, in means of knowledge. But today the new ways of action and expression use information as a medium as opposed to simply as a tool. Information alone includes a countable value, the utilization of which can result in profit. While the industrial revolution offered the possibility to increase production and augmented the capabilities of the human body with the help of machines, the new technological revolution of information augmented the abilities of the human mind. Humans are not only mere pilots of the machines but they are the creators, as they can create, change and publish in multiple copies, without the mediation of a working class. By offering the necessary force to produce, distribute and communicate, this new reality penetrates every aspect of human activity, extending and augmenting the possibilities of the mind.

Below I have studied how information technology has augmented our perception of reality to a virtual one and has altered the way we perceive traditional notions of space:

4.3 Adjacency or physical space neighbors, while a virtual space is linked - The transition from the footnotes to Hypertext and back

Before the information technology revolution three discrete medium systems existed: the *text*, the *sound* and the *image*. Each was supported by and expressed a whole different technological platform. Information technology has resulted in the unity of all those systems into one, through the bits. One single medium, has allowed the transmission of those three different types of data with the speed of light through fiber optics. (Ramonet, 1999)⁸ One of the main characteristics of this reality is the interconnection of information on a unified and homogenized platform of transmitters and receivers. Thus the fundamental virtue for the development of this system is not based on its introversion but, to the contrary, on its extroversion: its realization as an open system which, as opposed to being immaterial and weak, is simultaneously

adaptive and flexible. This new reality does not try to impose itself with the definition of singularities, which as subjective countable units would lend it power, but draws strength from its own *open source* logic. In addition, the spread and interconnection of information exponentially increases its possibilities by offering the potential of access to remote users. The de-localization of information offers new hopes for participation, but also new odds of disclosure for specific social groups or even for whole countries.

A physical, tactile location, a defined part of the space has the ability to *neighbor with*, meaning the attribute to be *in the vicinity of* other physical locations. This quality is redefined in virtual spaces, as the meaning of vicinity or territorial proximity is transformed. A space suspended on the internet, being a website or a virtual environment is not neighboring with others spaces but it is *connected*, or better, *linked* with them. An immediate result is the absence of the influence of the surrounding environments as an influence of materially carried entities. Therefore a virtual site refers to other sites or is referred by them, a practice that elevates the relation among them to a relation of interconnecting and bi-including ideas that substitute the mechanical interchange of materials.

An example of this transformation is that of *text*. Text used to exist in specific locations such as books, magazines or newspapers. The medium was the paper, a solid entity that provided the reader a complete version of the text. Of course the creativity and the interpretation of the reader can provide different versions of the text, but at least one possible existence of the text was always in front of him. The digitization of the text provided the first necessary step for the virtualization of it. With the invention of the internet and the creation of the hypertext, the text enters a new era of multiple actualizations that take place according to what path the reader follows each time he reads a text. Being online, the hypertext includes links to other texts, expanding its possible different version to an enormous stage. Each time the reader follows a path of this interconnected network of information he actualizes and therefore synthesizes a different text. (Levy, 1999)⁹ Still this new possibility can be extended to an infinite ways of perceiving a text by including the ability to transform the medium through which we read. The traditional footnotes that referred to external sources and multiplied the actual length of the text or a book have been actualized in the form of the link in the hypertext providing the instantaneous connection with the referred quotations. Today a new revolution is taking place online, where the users with the use of *Annotation Software* like COHSE (Conceptual Open Hypermedia

Services Environment)¹⁰ are offered the ability to add annotations on each hypertext they read on the internet thus changing the actual medium of the text reading. This interaction completely alters the traditional way of reading and even the way of perceiving a webpage, as the mental processes the reader has to go through are altered or multiplied. This virtual expression of footnotes and hand written notes makes every published text on the net a personal version for each individual. The first published text is nothing but the seed waiting to take a shape from the interaction by different users.

4.4 History or from a subjective agreement of the reasoning of facts towards an objective recording of actions – Napoleon vs. Herodotus

“What is history but a fable agreed upon?”

Napoleon Bonaparte

An online space seems to lack historical past, in the form of cultural continuity or morphological consistency. From a housing locus to a public circus or building, space is respectively enriched with the memories or symbolic meanings of the past. The emotions that emerge from the sight of ideological emblems can also be generated by visiting a place that is intellectually charged with historical events, of local or global scale. According to the political structure of each society those memories are conserved in order to support specific ethnic interests and construct a collective memory of the locality, or are diminished to the point of the single naming relevance. It is evident that the ability of intervention on a physical place is proportional to the persistence of the history connected to this space. A virtual environment seems to be the result of the convergence of the intentions of the creator and the interaction of the users among them and between them and the available resources. Traces of actions have to be dispersed and a diagram of the users' actions has to be constructed to substitute the memory of the space.

Napoleon appears to have commented on history as a series of events that nations have agreed to consider as facts. This way of perceiving history as a subjective seasonal interpretation is in contrast with this of Herodotus, the ancient Greek historian, who by traveling the then known world was trying to record the objective facts of each location. Although his works contained a lot of stories that people in different places were narrating and apart from the fact that he was giving his own interpretation of some historical events, his motive was to record history as a

succession of objective events. This clumsy metaphorical comparison can characterize the way the events can be recorded today in an online space. The ability to store information as a linear documented succession of the users' actions provides us the new ability to review the past in an unprecedented way of objectivity. In addition today's surveillance systems offer the ability to observe at a realtime basis a desired location or person. As Gilles Deleuze (Deleuze, 1992)¹¹ points out, we are in a transitional period from the 18th and 19th centuries' societies of disciplines - as they have been historically located by Michel Foucault - to a society of control. In such a reality, prisons would be of no importance as the convicted ones could be monitored constantly in the outside world. The ability to record their actions and movements would affect their behavior in such a way as it doesn't escape from the predefined - by the state - as the accepted and legitimate one. This reality, apart from being a case of controlling people, represents the every day life of today's consumers, whose behavior and preferences are constantly recorded from discount plastic cards or from web browser *cookies*. Those statistics are used by companies for marketing purposes in order to offer targeted services to specific clients, in a constant effort to maximize their profit.

4.5 Mutability or a real-time adaptation to ad hoc actions - The influence of Leibniz in contemporary architectural thinking through the work of Gilles Deleuze

Even if the designing of a physical space can lead to a concrete, built form, the effect of social forces along with the interaction with the users usually alters this temporary result. Along with that it becomes obvious that in contemporary architectural practice the final outcome of the building is never the simple result of successive actions. The different interests that interact throughout the designing process result in the alteration of the initial or intermediate forms. In addition, even after the completion of the construction the different dynamics that act on it tend to destabilize and alter its structure. A virtual space, by being "*the representation of the structure of the information*" (Engeli, 2001)¹², has the ability to alter its form in real-time relation to the actions of the users.

Although the notion of continuous transformation and movement has already been posed by the modern movement those new abilities of information transform the architectural procedure from a procedure of successive actions leading to a final end to a procedure of continuous transformations. "*The beauty of the end*" (Picon, 2003)¹³

can no longer be a characteristic of spaces, because mutability is not only unavoidable but also exists as a fundamental component. In his article about architectural curvilinearity, Greg Lynn (Lynn, 1993)¹⁴ is descriptive about the historical past that has led to the contemporary thinking of form as a constant mutable condition, able to react to ad hoc actions. Since the 70s and until the late 90s architects were mainly concerned about the creation of heterogeneous, fragmented and controversial morphological systems. They were trying to encapsulate in a common logic the differences that occurred from multiple social, political and natural procedures. This has led to forms in which the differences among their components were discretely visible. It is obvious that continuity and homogeneity can only result from the attempts of Neo-classicism and Neo-modernism through the continuous reconstruction of a consistent architectural language or from identifying local consistencies resulting from indigenous natural resources, environmental elements and traditional techniques as in Regionalism. Both of the above approaches can only lead to a completely heterogeneous or homogeneous result.

The influence of the philosophical texts that have analyzed and interpreted the work of G. W. Leibniz, in relation to the incorporation of heterogeneities in a homogenous and inseparable unity, has inspired the hope that a morphological system able to unify all differences in a continuous and heterogeneous entity could exist. An important impact in that direction has been the work of Gilles Deleuze on the theories of G. W. Leibniz. In his article about Leibniz (Deleuze, 1993)¹⁵ he notes that Leibniz has tried to interpret the curvature of the universe according to the fluidity of matter, the flexibility of bodies and the *motivation* as a creativity mechanism. What Leibniz saw with this approach is not fixed concrete bodies of a specific structure, but bodies that, if divided to smaller bits, will eventually amount to *vortices* that constantly move. Leibniz believed that in order to discern the different particles of an organism you have to disaggregate it. What would characterize the ideal liquid would be the complete absence of cohesion, an attribute that can only be ascribed to a material that can be separated from a total. Through this interpretation it becomes clear that two particles from completely different materials can be inseparable, something that is observed from the forces that define the curvilinear movement of a body and from the intensity of those forces that affects the cohesion among its parts. For Deleuze, according to the above, a body has degrees of solidity and degrees of fluidity, being flexible, with its flexibility being defined by the external forces imposed on it. A flexible material can maintain the cohesion among its parts in such a way that they don't

separate into smaller particles but are allocated into smaller and smaller folds that always maintain a degree of continuity. By perceiving bodies as flexible, mutable entities, Leibniz was strongly opposed to Cartesianism. (Deleuze 1993)¹⁶

The spreading of personal computers and the new abilities of parametric design has led in 90's in the first attempts to include these theories about matter in architectural design. That new way of thinking tried to produce works that did not function either as self-inclusive systems of an architectural mastermind or as machines that could satisfy the different needs of the building program. It produced forms that are altered according to external or internal factors, attempting at the same time to maintain their continuity and homogeneity. The uniqueness of their identity is inquired through the multiplicity of connection of the space with interacting forces. Loyal to a Leibnizian ambition, architecture attempts to produce algorithms that show not only the eternal diversity of the world but at the same time its unity. (Pividval, 1990)¹⁷

4.6 *Limits* or from construction of borders to the management of access – The importance of ownership and copyright and the rival force of the Open Source

"I DO NOT OWN SNOW WHITE"

Pierre Huyghe¹⁸

One of the main characteristics of a physical location is usually its discernible limits. Those limits can be indirectly expressed by the adjacency of the space with another one, or by the specific concrete construction of material borders. Particular for the western societies and capitalist economies, limits are of great importance as they define the specific range in which the owner is able to exercise his rights of ownership. In the reality of a virtual space, the question imposed is what the limits are and how they are defined and managed by the user. In a virtual environment limits seem to be understood mostly as the procedures defining the interconnection rules with other locations through *firewalls*, rather than defining the movement freedom.

With the introduction of television, the audience was a passive receiver of information participating in a one-way action. With the development of cable television, the user could choose among multiple channels and subjects. The evolution of these systems is the digital television, where the user can demand specific programs which are broadcast only at his receiver. This reality has set the foundations for the transition

from passive, massive culture to an interactive, selective one. The interaction of the user with the object was established by the distribution of internet, where he can shape his own world. New virtual networked worlds have started to emerge, functioning parallel and ancillary to real ones. This space creates actions and at the same time is generated by the actions of the users. This new power of free distribution of ideas was established through an *open source* philosophy that presents a great opponent to the dominant traditional market structures. (Castells, 2000)¹⁹ The degree of access to these networked materials is what characterizes the ability of a society or an individual to communicate and exchange information. In the business world, which is probably the most well organized internet reality, it is practically impossible for new companies to survive if they do not offer their clients the ability to access their services from remote locations. Only very few sellers who offer unique and traditionally established products can still survive by providing their customers with their status-valued handworks.

As McCullough (McCullough, 2004)²⁰ accurately observes, in traditional societies the state of being inside or outside the city walls was certainly obvious. As discernible as it can be you were either in or out. Being interconnected by participating in the online world of the internet the ability to specify your own limits is not so concretely defined. Programs that manage the access replace the traditional borders. *Firewalls* manage the outgoing and incoming data from one point of the network to the other, but the average internet user is usually completely unaware of the processes that take place at his machine. In this reality where people try to define their privacy in an interconnected digital realm, the culture of *Open Source* seems to offer an alternative solution to this anxiety, by understating it as an opportunity and not as a danger.

4.7 *Texture* or a link between digital and physical – A transition from the architectural poetics of shadow and light to 3dsMax

A space existing in the physical world is constructed by materials and therefore consists of their attributes. In a virtual environment the use of materials in the translation of *texture* seems meaningless. Materials in the virtual space are the link between our previous apprehensions for the experience of spaces with the new practices of digital realms. Their use intends to import in the virtual space a reference to the physical world, helping the designer or the client to visualize the future final product and the user to connect the abstract environment he inhabits with concrete and measurable qualities. The way texture and materials are perceived in virtual

spaces is described as the way surfaces respond to light sources in the scene, assigning therefore a different color to each pixel of the object (McFarland and Polevoi, 2001)²¹. There is a transition from the traditional descriptions of lights and shadows that a volume of the building creates, to the integrations of those qualities in a space where natural forces do not apply.

PART II

5. STUDYING EXISTING NETWORKED REALMS AND TRACING UNDERLYING RULES THAT APPEAR TO GOVERN THEIR FUNCTIONAL AND DESIGN STRATEGIES

In order to specify to what extent the above theoretical background has affected the designing process and the functionality of virtual worlds, some case studies have been chosen and studied. Among those are the most common chatting programs, usually referred as *messengers* like IRC, MSN, AOL, Yahoo!, ICQ and Skype. Those programs have to be distinguished from those of internet communities and network realms because their function is based on the action of communicating through text exchange, providing also the ability to transfer files or more recently more and more convenient ways of exchange real-time video calls and sound. Those contemporary bit-telephones may not yet correspond to the idea of the "*holographic assistant*" conceived eleven years ago by Nicolas Negroponte (Negroponte, 1995)²², but for sure have altered the way people communicate and exchange information.

The above technology, by providing the necessary infrastructure for essential communication, has transformed the way people interact in order to socialize or entertain themselves. The first MUD (Multi-user Dungeon or Domain or Dimension)²³ can be traced far back as 1977, only ten years after the emergence of the internet in its primitive form. Lacking any graphical representation of the actions taking place, those *grand fathers* of the contemporary network games are still inhabited by thousands of users worldwide. Today, any game needs to have multiple users' capabilities in order to be competitive in the global market. With today's reality of MMORPGs (Massively Multiplayer Online Role-Playing Game) and with some of them surpassing the 6 million users worldwide (World of Warcraft)²⁴, it seems difficult any more to imagine games as software that is executed in a single machine.

Although modern graphic cards offer the capability for advanced mathematical calculations, the contemporary ability to use the computer in order to produce graphics was not always considered self-evident. During the 1970 it was considered a great luxury to use the valuable processing power of a computer in order to produce graphics. The memory consumption was so big - in comparison to the power needed for the processing of any other calculation tasks - that computers had to be devoted only to the single task of the image display. (Negroponte, 1995)²⁵ The dissertation thesis of Ivan Sutherland in the Technical Institution of Massachusetts in 1963 is considered by historians as the most important turning point for the future of

CAD (Computer Aided Design or Computer Aided Draft). In the paper he presented important thoughts that are considered valid until today, like *interaction* and *object oriented modeling* (Schmitt, 1999)²⁶. The transition from the DOS years to the windows-like interface of Windows 98 in personal computers at the second half of 1998, something that had been achieved years ago in Macintosh computers, announced the new époque for computer interfaces. Since then the majority of software today runs under a graphic environment (GUI) and even Linux, the only competitive operational system to Windows, would follow the same logic in recent years. Meanwhile, the introduction of the World Wide Web (WWW) and the *Hypertext Markup Language* (HTML) advanced the internet functionality to the same graphical reality.

From the above case studies the following characteristics have been traced:

5.1 Identity

The most basic characteristic of any online communication system is that in order to log in you have to choose an identity. In the case of instant messengers like MSN or AOL, this name is stored, providing you with an online *passport – identity*. In this way you create a network of contacts that subsequently include or exclude others. The limits of your space are defined by allowing or blocking other people to contact you. As a result, like with email addresses, people are not so willing to change their names; in contrast to chat rooms, like those accessed by IRC, where the user has the ability to change his name every time he logs in and practically chat incognito in any open chat room he wants. Anonymity in those places is considered a privilege, as one of the main practices of use is the seeking for partners. On the other hand in network games, the identity is of immense importance, as the users are very keen in creating their own fame, even if that fame only last the short period of time they participate in those worlds.

Obviously identity in a virtual world can be the result of free choice for any individual. According to his free will anyone can construct an artificial identity, in order to achieve a goal or satisfy his personal fantasies. In a continuously increasing demand for identification in the tactile physical reality, the ability to navigate through spaces with a constructed identity provides a haven for the users of the internet. As Kevin Robins (Robins, 2000)²⁷ points out, this freedom provides the ability for people to explore how their lives or personalities would have been if they had the power to

change them or if they had followed different paths in life. This identity can also arise from the interaction with other users, augmenting therefore the virtual dimension of someone's personality. This anonymity of course can last as long as the users don't commit criminal practices. The ability of system administrators and police to trace them through their IP (Internet Protocol), which provides a unique identity for every user, suggests that actions can only stay in obscurity if a behavior complies with the laws of the real society. Of course in the chaos of millions of users of the internet, such behaviors have to attract wide attention in order to be spotted, but the real life experience, where people have faced justice and occasionally been convicted shows that a virtual world can lead people to a concrete physical prison.

5.2 Simulated and non-simulated rules

Another characteristic therefore of those worlds is the inclusion or exclusion of specific rules. They have been built on the way societies have been built so far, where rules are introduced in order to define the common accepted behaviors and ethics. This is partially a result of the deterministic way programming and computers work, where the same actions will lead to the same result, excluding uncalculated events as being errors. The user's ability for actions is limited therefore to the predefined ones. It is the multiple results from the interaction among the users which gives birth to the emergence of multiple events, providing the infinite complexity of collective actions. From the pre-internet era with games where the user could only behave with a very limited perspective of choices, the complexity of events has been augmented by interconnecting users, making it almost impossible to individualize actions.

Those rules are susceptible to changes as the users can exercise pressure for alterations or complete elimination of them by contacting the administrators of the worlds. This direct collective influence of the users will stands opposed to the representative democracy of our days, where people must base their hopes on others in order to determine their own future. Without being a utopian world where the users can act as they wish and without being the contemporary society where the will of public can be ignored by politicians, those rules are far more flexible to alteration than physical ones. Any will can be expressed directly, instantly and augmented by a collective action, whereas today's voting system requires four to five years in order for the representatives to undergo public judgment.

5.3 Possible and excluded actions

Although the possibilities for actions can mathematically be perceived as limited, there is one characteristic of virtual realms that comes in unlimited extensions: *speech*. This fundamental characteristic for communication among users is the one that leads to a complexity that seems impossible to be subdivided into discrete elements. This layer of the unexpected and unforeseen creates a multiplicity far beyond the ability for subdivision. It seems that this is a fundamental reason why chatting engines provide more than enough interaction abilities than virtual realms where graphical interfaces represent the users outlook. As Deleuze approaches it (Deleuze, 1966)²⁸, Riemann had distinguished multiplicities between *discrete* and *continuous* ones. According to Deleuze, for Bergson the subdivision of the later ones could only lead to the variation of their metrical principles at each stage of subdivision. This way of perceiving a complex multiplicity emerging from the interaction of users seems to come in reality only by adding the uncertainty of the dialogue layer.

5.4 Graphic Environment - Reference System - Navigation System

A fundamental characteristic of virtual realms that include a graphical representation is the navigational system. If a graphical environment exists where the user can immerse himself there is the necessity for a navigational system and therefore the need for a reference system. As a result referral points exist, from the simplest ones to the creation of whole digital cities. In the plurality of virtual realms the users exist in a minimalistic digital representation of the real world or at least of a fantasy one based on the constructions of real worlds. There are cities, roads, landscape differentiations, all included in a complete map of data that positions everything in a spatial configuration. The real time adaptation of actions also requires a time reference, including, as a result, the *time* dimension in those worlds. By including time, space acquires the parameter of distance, another characteristic of real space. Of course in the networked fantasy worlds the diachronic wish of teleportation can become true, disrupting the notions of space and time. The more precise a reference system seems to be, and more close to the real world of signs and maps, the more the virtual space seems to obey to natural laws of the tactile world. It could be therefore argued that this realistic approach of the interface deprives those spaces of a virtual logic and lowers them to simplified representations of real spaces.

5.5 Socialization: Competition - Cooperation - Advancement

The main aspect and function of those spaces is the socialization of the participants. This includes different aspects of the physical life, such as competition, cooperation and advancement of the individual. Each of those aspects has different importance in different worlds. In some cases cooperation is excluded and in others it is the only way to progress or even survive. Although competition among individuals in network games is always a fact, in order to achieve personal advancement, the first thing users seem to do is to form alliances. It is also very common that in those groups a gradation of privileges exists, where some users have more power over the registration of the group, by being able to exclude or include others. This resembles the formation of syndicates in real life, where people seek power through the protection of their common interest. Having the support of others in order to improve your social status and increase your influence is an inner substance of capitalistic economies, where the ability to participate in more exclusive groups is considered a privilege.

PART III

6. DESIGNING THE EVENT_FIELDS

The name Event Fields was inspired by the title of the book “*Being and Event*” by Alain Badiou, the French mathematician and philosopher whose work on the virtual has provided the most inspiring phrase about perceiving multiplicities: “*What is not a being is not a **being***” (Badiou, 2005) ²⁹. The word “*fields*” express the ambition of including the studied notions in a complete entity with a perceivable nature, while the title predisposes the emergence of unexpected events in a virtual world.

6.1 Initial concept of the program

The main functionality of the virtual space was the ability to communicate with other users through text exchange and also publish text for other users to read. The initial concept of the program included the ability for the users to manipulate their own environment in order to adjust it to their own preferences. The notions that have been studied to the previous chapters of this thesis, such as *limits*, *history*, *mutability*, *texture* and *adjacency* were exposed to reconsideration, on the basis that they are expressed as extensions of a virtual reality. The *history* of the space should be constantly recorded in a log file, providing the ability of the instantaneous review of the past. The concept was to provide an objective view of the actions that have taken place in that space. *Mutability* was perceived as the ability of the space to be altered according to the real time actions of the users. It should therefore provide the users the ability to alter their interface and also generate unexpected events even for the programmer itself. *Adjacency* was conceived as the ability to refer to other places or to other users not by neighboring with them but through information exchange. Additionally, *limits* were thought to express the ability of the users to negotiate the access of others in their space. Finally *texture* was considered as the medium of expressing color differentiations among different places of the space.

6.2 Programming the Event_Fields

i. The programming language *Processing*³⁰ was used in order to construct the Event_Fields. Although *Processing* offers an easy platform in order to produce simple solid objects, the objects consume a lot of memory and therefore make the application very slow. In addition it was important to try to avoid primitive geometrical objects in an attempt to provide a more abstract representation of the ideas. In order to achieve that the initial shape was created in 3ds Max (img 1) and then exported to

an .obj file (img 2). An external library was used in order to import the shape in *Processing*, but after multiplying the object the program became so slow that it was almost impossible to use (img 3). The solution was included in the .obj file itself. By editing the file with an editor it became obvious that the file actually includes a series of coordinations (img 4). By excluding some of them in the reading process of drawing the object the file became manageable (code 1 & 2). Finally the initial shape was multiplied several times creating a five by five grid (img 5).

The attempt to include complex shapes in the environment required a lot of time and research. While the function of the program would have been achieved even by simple cubes, it was important to experiment with complex, but more importantly with more abstract, shapes as representations of a not yet concrete idea. It was initially attempted to place the objects in random positions, but an initial positioning of them on the grid was satisfying enough in order to advance to the next levels of the program.

ii. The next step that was considered necessary was to introduce the ability to navigate in the space and select one of the twenty five objects. It was considered interesting to try to avoid the typical navigation system of most graphical virtual worlds, where the users, in a realistic way, move into the space as if walking in a physical environment (img 6). If the same technique was to be used then reference points would be created and consequently a map of the space. In contrast the users observe the totality of the space from the outside, rotating the whole space around itself, being able to understand it as a whole at any given moment (code 3). Therefore the interface was handled as the way of examining an object on your hand, avoiding by that way the immersion in a Cartesian system of points and references. In order to identify the objects and select one of them, the program was tracing the position of the mouse pointer, comparing it to the projection of the points that constructed each shape (code 4). The realization that the 3d world that was represented was nothing but an illusion was interesting, as on the screen every shape has two dimensions and as a result the viewer always sees a projection of the object on a two dimensional plane (code 5).

This way of handling a space as an object-interface was fundamentally different from the plurality of the previously studied virtual worlds where immersion seemed as important as the place itself. Here the user could have an impression of the totality of the spaces without having to navigate through a representational map.

iii. When a user accessed the specified site he was randomly assigned one of the total twenty five points of the space (code 6). He was initially assigned a name as *anonymous_#* (code 7) but had the ability to change his name to one of his preference (code 8). This identity was not saved to the system, providing the user the possibility to log in each time with a different name. Identity therefore resembled more to the way it is dealt in chatting rooms than in network games, and it was perceived as an ephemeral declaration of each individual's will. That would allow the users to choose their identity according to their temporal attitude yet still anyone could operate in the space by being an *anonymous* one.

Although the initial ambition was to be able to interconnect with multiple users, finally because of programming difficulties, the users were able to participate only at one conversation at a time. At this point a fundamental characteristic emerged. The user was different from his space. A user owned a space but could move from space to space in order to participate in a dialogue or to see the publication of others. This introduced a feeling of movement from space to space rather than that of the function in instant messengers where someone is able to be linked to anyone and chat simultaneously. In the other hand the user had the ability to publish anything in HTML, and as a result to open an internet explorer in the explorer's window, therefore linking his space with anything published in the internet (img 8).

iv. When entering the site the user's space was turned into the color *red* and the space started to vibrate in order to indicate the position more clearly (img 8). For him he would always be red, or, when he published information, *dark red* (img 9). Anyone else who logged was light *blue* for the user (img 10), except if they published something so they would be assigned the color *green* (img 11). It became obvious that if the user was assigned the color green and he published something then it would be impossible to tell by looking the space where his space was situated. The lights assigned to the scene by default included a spot light projecting from 45 degrees. These characteristic created shadows on the objects, providing the only orientation attribute of the space (img 12). I have chosen to limit the lights only to this default one as more lights would eliminate the shadows, erasing any orientation feeling.

Although by moving the mouse pointer over a space the user could obtain information about the people participating in it (code 9), by this manual-like color scheme, *texture* became one of the fundamental tools of perception of the action

taking place in the space. Without any complex alterations of the shape, the space was understandable by all the users. An attribute what instantaneously connected the physical with the virtual world.

v. The user could perform two main actions. The first was to chat with others and the second was to publish text for others to see. Chatting was conceived as the most important and fundamental action in the space, as it would generate originally and by default unexpected dialogues. In order to chat with someone the person had to visit his space by pressing the left mouse button on it. In every space up to twenty five users could participate in a conversation. When two or more users existed simultaneously in the same space the shape started to sparkle (img 13) in order to be obvious to other users that in that particular space there is action taking place. It was initially attempted to be able to manage the access of different users but I chose to experiment with an open system, where anyone could visit anyone without limitation.

Limits at this point seemed to be obscure as a notion and difficult to perceive. They could be the access management of each space, the shape limits or the limitations in the navigation in the space.

vi. The actions of the users were constantly recorded in a log file (code 10), providing the ability to review the conversations and the published text at any given moment (img 14). A time and IP tag gave the exact time of the users' actions and their real position in the internet. Although this was happening in order to obtain an objective recording of the past, it soon became evident to me that a major factor that would provide me this ability was lacking: *the intention of what it was said*. Apparently the conclusions from the reading of the logs could only be another interpretation based on personal assumptions.

7. TESTING THE PROGRAM

From the use of the program, and from conversations with the users and their reports, interesting outcomes have emerged. A common observation was that the space looked too concrete. Most of the users were feeling confined because they couldn't move their space inside the global one and have asked for the ability to reposition their ground wherever they wanted. Without having previous knowledge of the objectives of this research the users felt the need for more mutability than provided. It was of importance to them to be able to choose the position of the place

than just have a place in the world. By being able to move their space the users seemed to be aware of a referential system that was resulting only from the existence of all the individual spaces. All the spaces had the same weight in means of position and there were no more important or less important reference points. Still this homogeneity seemed to include by default a perception of orientation.

The second most common comment was the inability of the users to manage the accessibility to their space. Most were surprised by the fact that anyone could gain access into their space and start a conversation. Surprisingly, this is the usual practice also in most instant messengers, where someone - if included in your *accepted list* - is able to talk to you, whether you reply or not. Now the users seemed to feel the limits of their privacy, because they were expressed in a graphical way. They asked me to include the ability to choose who could enter or not. This is expressed in chatting engines with the ability to block other users or to be invisible to them. It is interesting that the most popular instant messenger, MSN, has just included the ability of being invisible to other users and being able to talk to them, after almost ten years of existence.

Furthermore a lot of users wanted to see more events taking place. They were expecting their shapes to change according to the number of the people that were participating in a conversation or event and the ability to alter the shape of their space itself. They wanted the ability to personalize their space, in order to be different from the others. This individualization is common in virtual realms where people can choose an outlook from some predefined options. The ability to alter the shape by a *vertex picking* system, similar to the one of CAD programs like Maya, would provide a real unexpected event, where each one could specify a shape. This tool would offer an easy and understandable medium of participation in the final outcome of the whole form.

Most of the users have also suggested being able to keep their space even when they log off the system. The ephemeral participation was commented as interesting in means of temporal dialogues and publications but they would like to have the ability to own a space. Although the space was basically created for communicating and exchanging ideas, something that could happen under any temporary position, name or shape, the users were keen to owning a space, manipulating its attributes and altering its position.

Finally, an interesting outcome has been the complaints of the users that they were monitored by the administrator (me) and that they had the feeling that I was spying on them whatever they say or do. Although most of them were unaware of the fact that a log file exists, they have presumed that it does. It was interesting to see that although this is an everyday reality in every instant messenger, e-mail provider and virtual space, for the first time they were feeling that their privacy was in danger, because they knew who the administrator was. For most of them it was not important to be monitored by unknown people as they assumed that this could not compromise their privacy.

8. CONCLUSION - EPILOGUE

This research has attempted to identify the gap between the theory and the practice in the design process of virtual spaces. It studied the way that information technology has altered the way we perceive reality and how this new era of virtual reality offers new possibilities but also new reasons to be suspicious. Through the study of existing virtual worlds and chatting engines I tried to understand to what extent the theories of the *virtual* have affected their designing strategies. Finally in order to test those results I have designed my own virtual space and provided access to different users in order to experience it. From this essay interesting conclusions have emerged.

First it became evident from the reports of the users along with the conversations with them that most of the users require the ability to change their space. It seems whatever the final outcome of my designing process would be, the users - if provided the ability to comment on it - would express their preferences and possible alterations. This leads to the conclusion that in another test project it would be interesting to constantly change a virtual space according to the suggestions of the users. *“Every realization of the project would provide new information that could be included in the next designing process.”* (Papalexopoulos, 2004)³¹ This would introduce a new way of interaction design between the programmer or architect and the users of the space. The users demanded active participation, because they were aware of the possibility to alter the final product by participating in an interconnected reality of information exchange.

In addition, it became clear that the term *virtual reality* often refers to the fake representation of something real and this approach *“limits us from understanding the*

affect of information technology on designing process of new objects". (Papalexopoulos, 2004)³² The design process should be able to question any notion or value in order to redefine reality and produce objects of a new kind. In this designing process an open source logic that defuses knowledge to multiple locations in order to achieve a collective feedback provides new possibilities of creativity. In contrast to enclosed systems of knowledge where the power is attempted through the exclusion, this new force of collective intelligence and continuous transformation has the ability for innovation.

Apart from the above it was quite interesting to see the reaction of people to surveillance. Although their actions and messages are constantly recorded in a real time frequency while on the internet, the inability to identify the observer provides them with a feeling of security. It is considered that this recording would not affect their real lives, because the person that observes is a stranger. This feeling of security in a constantly monitored reality offers the certitude that someone will face justice only if he acts in a criminal way or in general in a way that is not considered to be predicted. The power of defining what is considered to be predicted, or not, falls on the administrators of the systems who by controlling the information flow, obtain an unsurpassed power over the users. New ways of preserving privacy should be invented.

Finally and most important, another notion seemed to obtain immense importance in this attempt to bridge the gap between theory and practice, that of the *tool*. By understanding the interface of each tool – specifically in programming - the user has the privilege not only to alter the way he uses it, but also change the tool itself. The programming knowledge limitations have kept me from transforming my instantaneous thoughts to reality - or virtual reality - preventing me from realizing my imagination. This limitation is also apparent to the users of the program, while most of them are not programmers and can only use it for the predefined functions. The Open Source programs where programmers publish the source code offer the possibility for the users to create their own outcomes, but still in order to do so, programming knowledge is necessary. It came as surprise to realize that for the average user and for architects with limited programming knowledge, virtual worlds are more concrete and difficult to alter than a physical tactile wall. While in physical life the inhabitant of a space can use a hammer in order to demolish a building in a virtual world he lacks the force analogous to the hammer. Nevertheless the virtual worlds and in general digital entities are considered and mentioned as flexible and

mutable. This seems to reflect the wish of the users to participate in the shaping of their world but in order to achieve that they have to be provided the ability to understand and even alter the interface of the new tools.-

THE END

“A year here and he still dreamed of cyberspace, hope fading nightly. All the speed he took, all the turns he'd taken and the corners he'd cut in Night City, and still he'd see the matrix in his sleep, bright lattices of logic unfolding across that colorless void...The Sprawl was a long strange way home over the Pacific now, and he was no console man, no cyberspace cowboy. Just another hustler, trying to make it through. But the dreams came on in the Japanese night like livewire voodoo, and he'd cry for it, cry in his sleep, and wake alone in the dark, curled in his capsule in some coffin hotel, his hands clawed into the bedslab, temperfoam bunched between his fingers, trying to reach the console that wasn't there.

William Gibson, *Neuromancer*, 1984

USERS' REPORTS

Yiannis Orfanos (Architect)

The experience of EVENT_FIELDS can provide a series of useful conclusions about virtual world and the integration of spatial qualities within. First of all the advanced and challenging technical aspect of this project shows that the architect has an important role in managing the creation of virtual environments and mostly in designing “machines” that trigger unpredictable experiences for users.

By using EF one gets connected with a specific place in the virtual space. So the attention of the user doesn't limit itself only to the names of other users but is much affected by the specific location of users in space. It is remarkable that in spite of widespread Instant Messengers the participation in conversation is filtered through spatial perception criteria.

EF gives an impression of being between private and public space, as anyone has each one area but at the same time the content of her or his space can be exposed to any other user. This characteristic reveals a constant negotiation in user's mind in order to understand a diagrammatically abstract space and simultaneously exploit the operational potential.

The possibility of publishing texts is very important as user sets up his identity and that fact has a significant impact for him and the others during conversations.

Angela Kouveli (Architect)

Achievements

1- method : combine the logic of on line chat rooms (that are represented as 2d windows-papers) and on line games (that try to imitate real space sceneries) seemed as a great opportunity to design a platform that is based more in notions and tendencies of the subject with(in) a physical space, rather than design an environment similar to physical.

2 - open : the brilliant idea is that it is not only a field where two or more singularities can interact, but a field of events where one can move from one bubble to the other, publish from his own position – red reference and at the same time be aware of others actions taking place around him.

3 - Graphics: Designing identical bubbles with the single reference, the red user, creates a map of self and surrounding actions (since these bubbles are transformed only when events happen). The movement of whole model and not just of each bubble is based upon this exact logic of acknowledge oneself only as part of the group. Great!

Missing:

1 - Limits-access: Being able to pass from ones room to another seems ok, when I could have the option to manage access or simply to call for “do not disturb” conversation with preferable agents either by locking room, or blocking users.

2 - History: the formula is actually a map of on line actions, though a diagram that shows the change of states from being on conversation to being simply in inertia, or the succession of room-bubbles that one followed would seem more interesting for any kind of observations or mind games, rather than just saving conversations as msn, Skype etc. do.

3 - Time: simultaneity of the Event_Fields program running together with other programs on the same computer was not evident. This means that except from the graphical way that windows use to represent a program that is open in parallel with another, sound provides also as an extra parameter to know when multiple actions are taking place e.g. Someone is calling, writing, or sending a file....Event_Fields make some noise please... I cannot hear u!!!

Michael Georgiou (Architect)

The idea of virtual spaces has just begun to emerge. Most examples represent imitations of the real world rather than fully exploit the hidden potential of the virtual dimension. Virtual spaces currently lack identity and the sense of emergence. I believe that the current work highlights several crucial points for the further development of virtual spaces.

By eliminating or partially blocking basic features of a common virtual environment, attempts to reestablish a connection between the user and the virtual. Features that we have been using in common chat engines are seen in a completely different scope.

The spatial character of this work is more than evident. Even the positioning of the bubbles in space (spaces in space) proposes a completely different approach.

Furthermore you are not represented as an avatar but as a *sprit* moving from space to space (bubble to bubble). You are invisible in a sense, but what makes you distinguishable is not your image (visual presence) but your actions.

This work attempts to reconcile space and place.

Marios Panayides (Programmer)

The representation of a chat room in the Event_Fields is immediately understood. Just by reading the short instruction page I could use the program and understand the metaphor. It was very interesting to see that some users during our interaction played hide-and seek in the different rooms, showing the ease of use and that the virtual world is easy to explore and feel comfortable interacting.

The basic concepts used in conventional chat-rooms are used here as well. One improvement is to be able to personalize each person's room. Additionally, a user should be able to restrict access to his/her virtual room. Following that, there should be some public rooms where no-one can restrict access to. In these public rooms, a theme could be used. For example, a virtual restaurant, coffee house or a music room with specialized themes and both visual and audio cues.

The most important thing for me when starting the Event_Fields virtual world, is that I could understand the concept easily and was able to use it without the reading thoroughly the instructions.

Nagia Tritaki (Architect)

I found Event_Fields really interesting and innovating as a web environment for chatting as well as really easy to use. I liked that I could have my own space, I felt familiar. At first, I was troubled that I couldn't be involved in more than one discussions, it seems like a direct transfer from the physical to the digital-virtual world something that I wouldn't agree on. On the other hand it is fun looking around for finding somebody.....

In general, it seems it has no limit of privacy (it is like entering in a room without knocking the door), so I wouldn't choose it in the case of chatting with a friend but if

we imagine a virtual forum, this “no privacy” situation would work perfectly as well as the given space for publishing work.

I would prefer to have the possibility to personalize my bubble (the beating like a heart...is as real as impressive) and by doing that, I would discover a really good reason for the zoom in-out and rotate actions.

Finally it would be useful if I was informed if I have visitors in my bubble when the window is down.

Dimos Lappas (Architect)

Congratulations for your project. I really enjoyed using it! I find very clever the idea of the spatial representation of a chat room. It would be very interesting if in the future you could develop even more that idea giving the sense that someone is moving inside a world of interconnected chat rooms, trying to find the one that is the most appropriate for him. Also it would be very interesting if any room could keep a history of the users that occupied it in the past, and especially of the text that had been published in it, in the same way that we write a text in the walls of a real room.

Natalia Giaouri (Architect)

The challenge of exploring a virtual space where you can chat with other people was impelling. While reading the instructions and without having seen the interface, I found the idea of Event Fields intriguing. However, the implementation is even more promising. The interaction between visual and speech properties has already been explored in many chatting engines but what seems pioneering here is the user’s “sense of a place” in the virtual space. The notion of belonging, by occupying a bubble from the cluster, and transferring, by entering someone else’s space, are being successfully captivated because of their direct visual impact. A suggestion for future research could be the users’ possibility of personalizing their space by choosing their own different shape or by adding photos, videos etc.

Olga Tzioti (Architect)

It is interesting the spatial interaction between individuals with the idea of the bubble. The bubble becomes your own space and the bubbles make the visual

representation of this space, which has to be intruded in order to have a chat. However it would be more fun if the bubble could be reserved, i.e. the next time you log in you can use your space (bubble) and see what people might have published in it (messages). Also it would be interesting to see a chat for more than two users in one bubble.

Also why not publishing texts in a more "public way" like for people to see out of the bubbles?

Instead of having the names of the users written aside, maybe you could find another way of representing the number of users of each bubble visually. Since the visual representation of the cyber chat is well presented. Finally, there is one negative thing in the space. You kind of feel like you are in Big Brother where the inspirer of the space can spy on you anytime you log in.

Przemyslaw Jaworski (Architect)

I think that it would be much cooler, if you would leave some kind of marks after each person that logged in. Because normally when I log in and there is no one there, I don't really know for example when the last time someone else logged in was and then I don't have any information about peak times, when do people really get in. Imagine transparent texts floating above the bubble saying names of people that have been inside, even when they are not there anymore...and slowly fading away through hours, until they fade out completely (for example after one day). People would know then, that somebody was there before, and that would encourage them to check it more often.

That's the biggest problem with online communities, that you don't know when you meet people, and that sometimes room is empty or maybe some graphs of activity, numbers of people per day, what times, etc.

Penny Papargyropoulou (Architect)

Ok, I think it's a great idea, in that it has a visual representation of the conversations taking place, so you have a more spatial perception of the event... I really liked it when I was in a space, chatting and I could see at the same time spaces being used (sparkling!). As far as the improvements you could do in order to personalize it, i.e. to be able to publish photos, to have your own photo appearing when chatting, to be

able to block users etc (whatever msn does) I think you know better than I do what could be done. I would possibly like to see more interaction with the spatial representation, for example a clustering of the occupied spaces or the ones where more people have entered, something like that...

And one more thing! As far as I can see it, when your EVENT_FIELDS are going to have millions of users your visual representation will be of a huge network, with millions of bubbles, where there will be a clustering of some kind, creating "event cities" and "event_neighbourhoods" or even smaller systems of spaces... (That's how I have imagined it, sorry about that...) In any case, in order to be able to navigate and start from a space where you can locate your friends, you should probably start from a specific point and thus the space you occupy should not be selected randomly, but you should be able to have your own space, as a starting point, every time you enter.

COMMUNICATION PROTOCOL AMONG THE USERS

To handle the communication between different users, I have implemented a client-server model between each user's Processing applet and a centralized server written in Java. The server and its client communicate through TCP/IP. The Processing applets present the users with their own view of the chat rooms, and let them manipulate both their view (rotate, zoom, switch cameras) and functionality (select user to talk to, publish messages, speak in public chat). Whenever a user action affects other applets, a message is sent to the Java server who handles all the synchronization and inter-applet communication issues. Each applet may receive such messages from the Java server in an asynchronous way.

Although the entire chat rooms functionality is implemented by the Processing applet and the Java server, only a small part of the GUI is displayed by the applet itself while DHTML with CSS is used for the rest. The Processing applet and the DHTML code communicate through Javascript code, which allows the applet to call Javascript functions (code 11) of its container page and the container page to call Java methods of any applet it contains (code 12). So the entire communication schema between each user's webpage and the centralized server is the following:

HTML ←--- Javascript ---→ Processing Applet ←--- TCP/IP ---→ Java Server

The communication between the applets and the Java server is performed through the exchange of simple text messages. Each side receives the messages asynchronously and handles them its own way. The communication protocol that I defined is the following:

Client sends / Server receives

NAME *name*

The client sends this command to the server to request a name change. Since all clients begin with an initial, anonymous identity (e.g. anonymous_1), they send this command to the server to personalize their name. If the requested name is valid, the server will reply with its own NAME message, otherwise it will respond with a WARN message notifying the client of the problem (see below). Invalid names include reserved keywords such as 'empty' and 'null', as well as names already used by

other users of the system. A client may change its name only once; subsequent NAME requests are silently ignored. (code 13)

JOIN *x z*

The client sends this command to join the ongoing chat in another user's area. If this area is available, the server places the user in the specified area and notifies every client of the change through the ROOM message (see below). (code 14)

SAY *message*

The client sends this command to broadcast a message in its current area. When the server receives it, it sends a similar SAY message to all clients currently in the same area as the user. (code 15)

POST *message*

The client sends this command to publish a message in its personal area. The server notifies the clients of all areas with published message through the ROOM message. (code 16)

READ *x z*

The client sends this command to read the published message of the specified (*x, z*) area. If such a message exists, the server responds with a BOARD message (see below). (code 17)

CLEAR

The client sends this command to clear the published message in its personal area. The server notifies the clients of this change through the ROOM message. (code 18)

Server sends / Client receives:

ID *name x z*

This is the first message a client receives after connecting to the server. It gives the client an initial name (*anonymous_xxx*) and its (*x, z*) id. The server assigns the (*x, z*) id randomly, giving each connected client a different id. The initial name is always *anonymous_xxx*, with *xxx* being the connection number of each client. So the first client will be *anonymous_1*, the second one *anonymous_2* etc. (code 19)

NAME *name*

The server sends this message in response to a client's NAME message, to let the client know that the name was changed successfully. (code 20)

SAY *who message*

The server sends this message to all users currently in the room of a user who broadcasted message (using chat). The 'who' argument is the name of the user who spoke the message. Once the client receives this message, it redirects it to the appropriate HTML layer by calling the suitable Javascript code. (code 21)

BOARD *x z message*

The server sends this message in response to a READ message. It informs the client of the published message of the (x, z) area. (code 22)

WARN message

The server sends this message whenever an error occurs. Once the client receives it, it uses Javascript code to create a popup window that informs the user of the problem. (code 23)

ROOM *x z board_id null* or

ROOM *x z board_id owner_name empty* or

ROOM *x z board_id owner_name user1_name user2_name ...*

The server sends this command to inform the clients about the status of the specified (x, z) area. For simplicity reasons, the server sends its clients a ROOM message for every area whenever a change in any of them occurs.

The first form of this message (with the **null** keyword argument) notifies the clients that the specified room is currently unreserved. Future connections will take one of the unreserved rooms. In this case the board_id argument will naturally be -1.

The second form of this message (with the **empty** keyword argument) notifies the clients that the specified room is owned by owner_name but it's currently empty (i.e. the owner is chatting in another room)

The last form of this message lets the clients know all the users chatting in the specified room, as well as the room's owner.

The 'board_id' argument is an integer number that identifies the published message of this room. If board_id is -1, there is no published message in this room. Each new message that is published in any room received a new board_id number, in an incremental way (the first published message will have a board_id of 0; the second will be 1 etc). The clients keep track of the board_id of each room, and when they change they inform the users that a new message has been published.

INDEX

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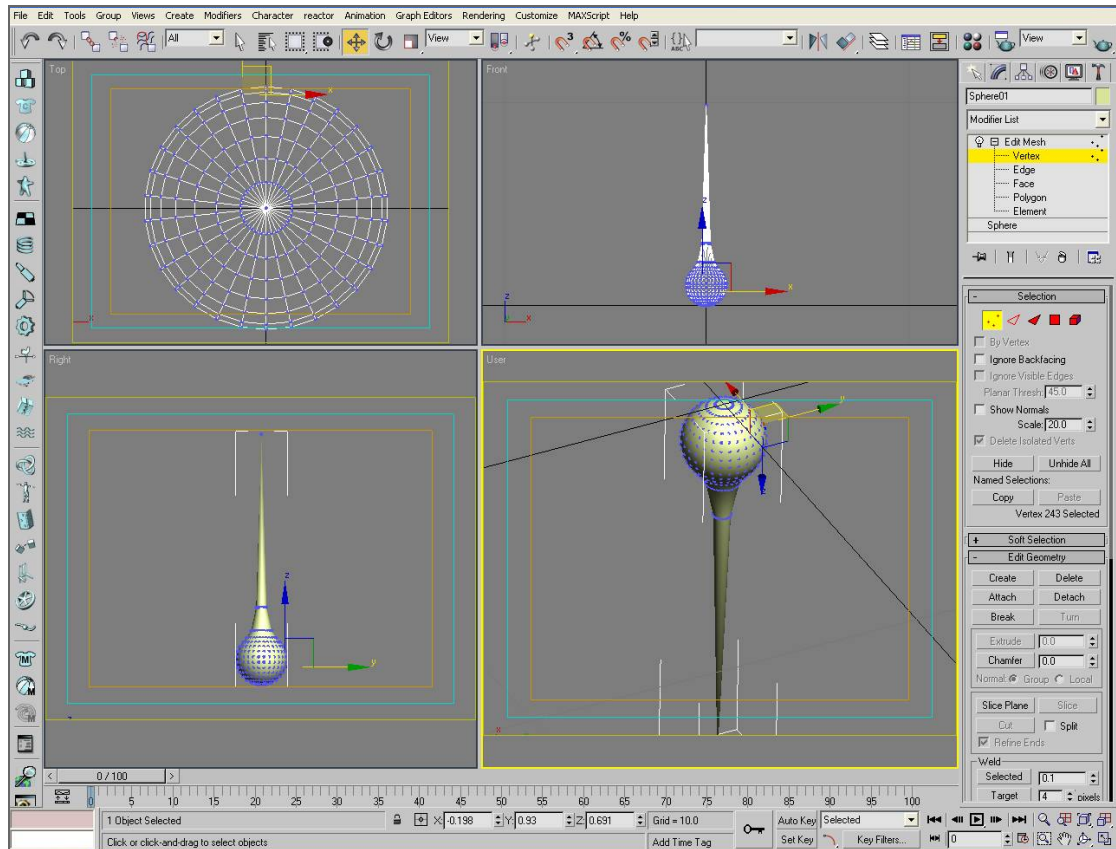
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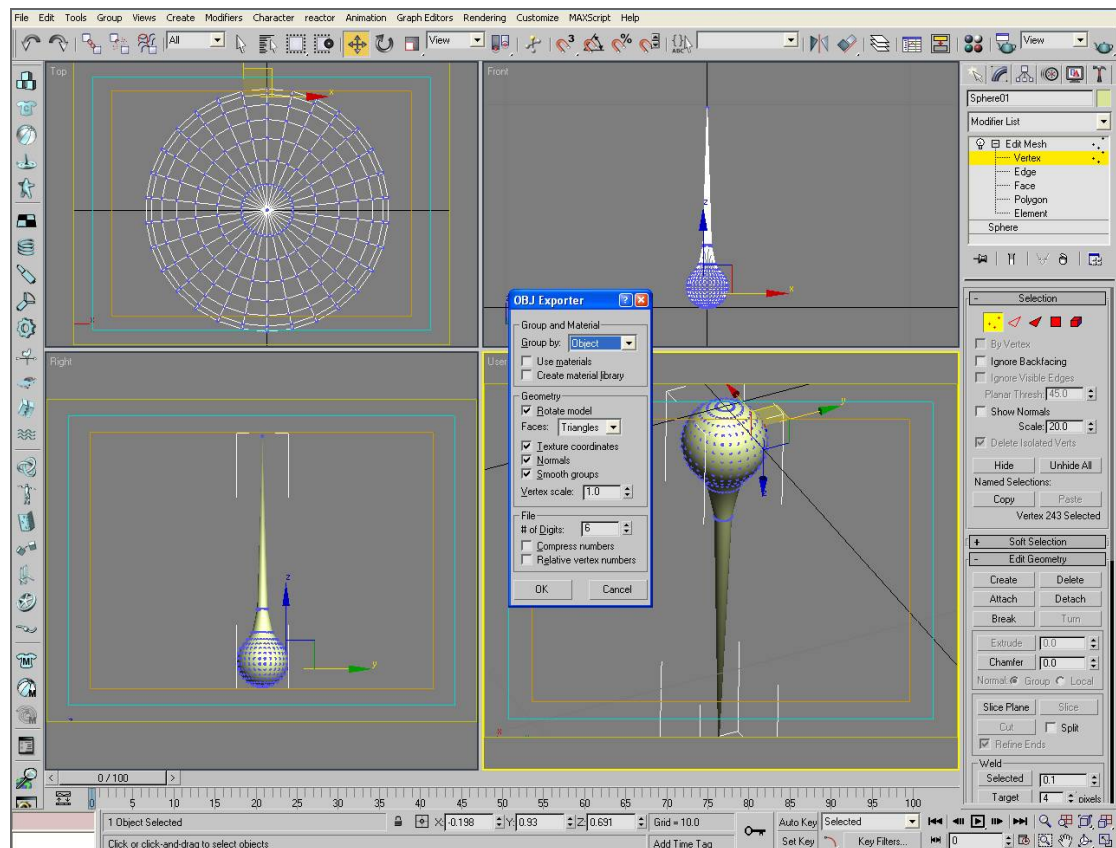
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IMAGES

img 1



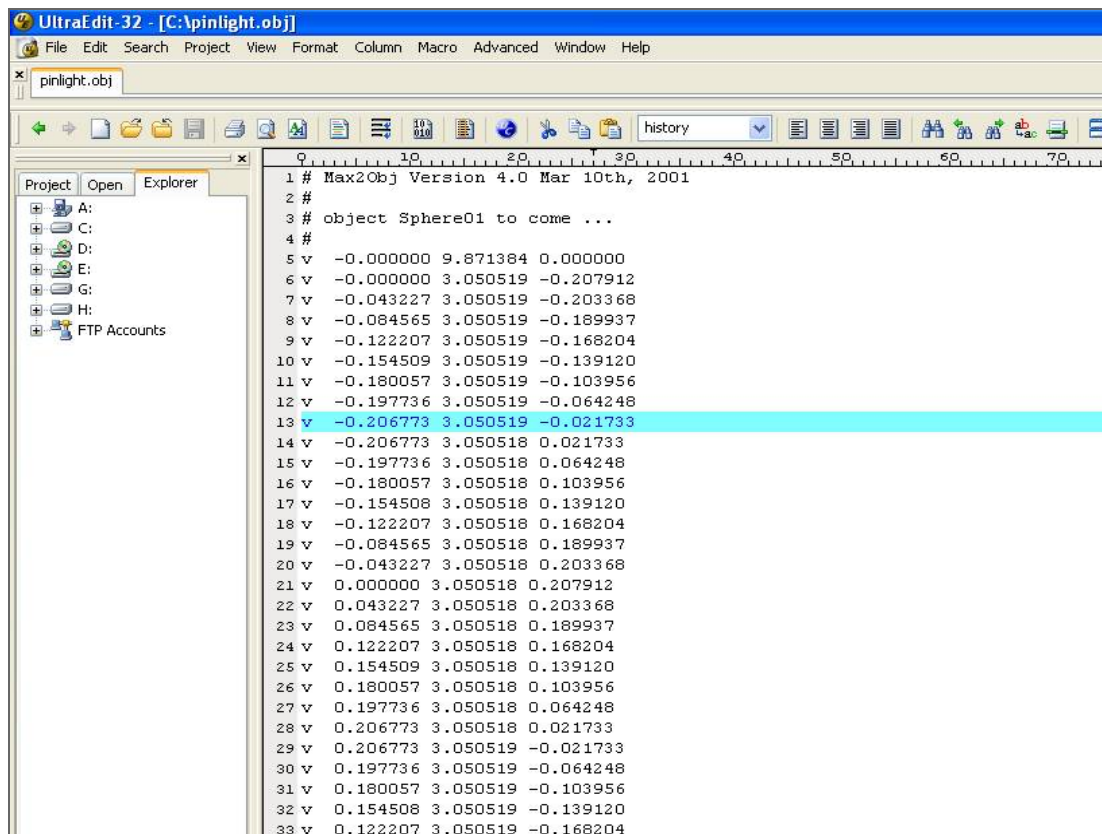
img 2



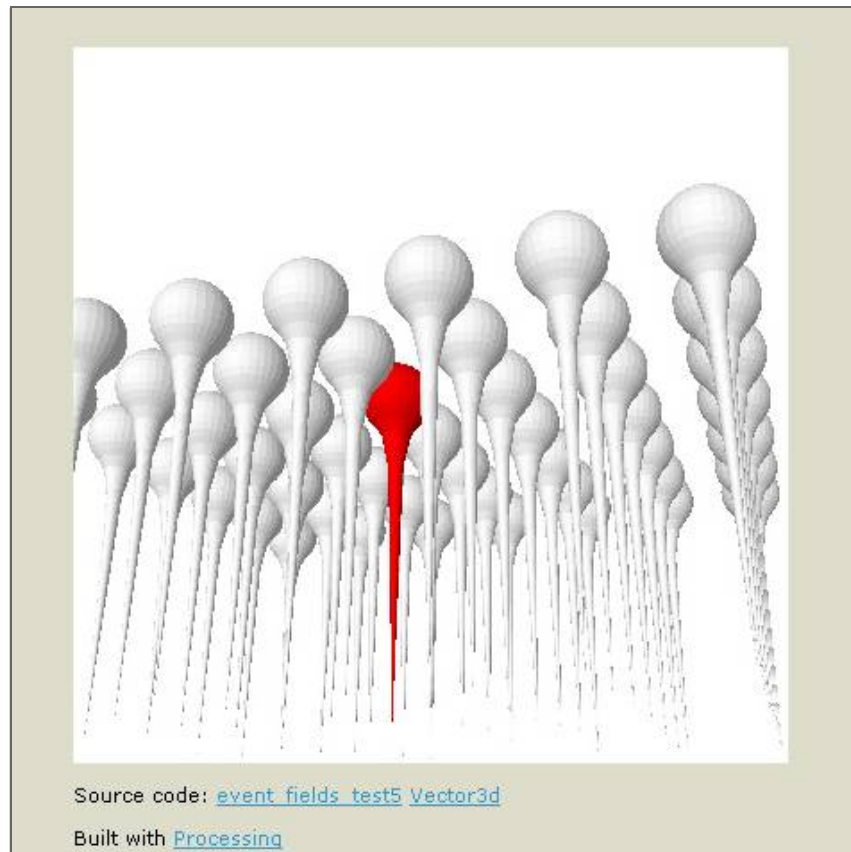
img 3



img 4



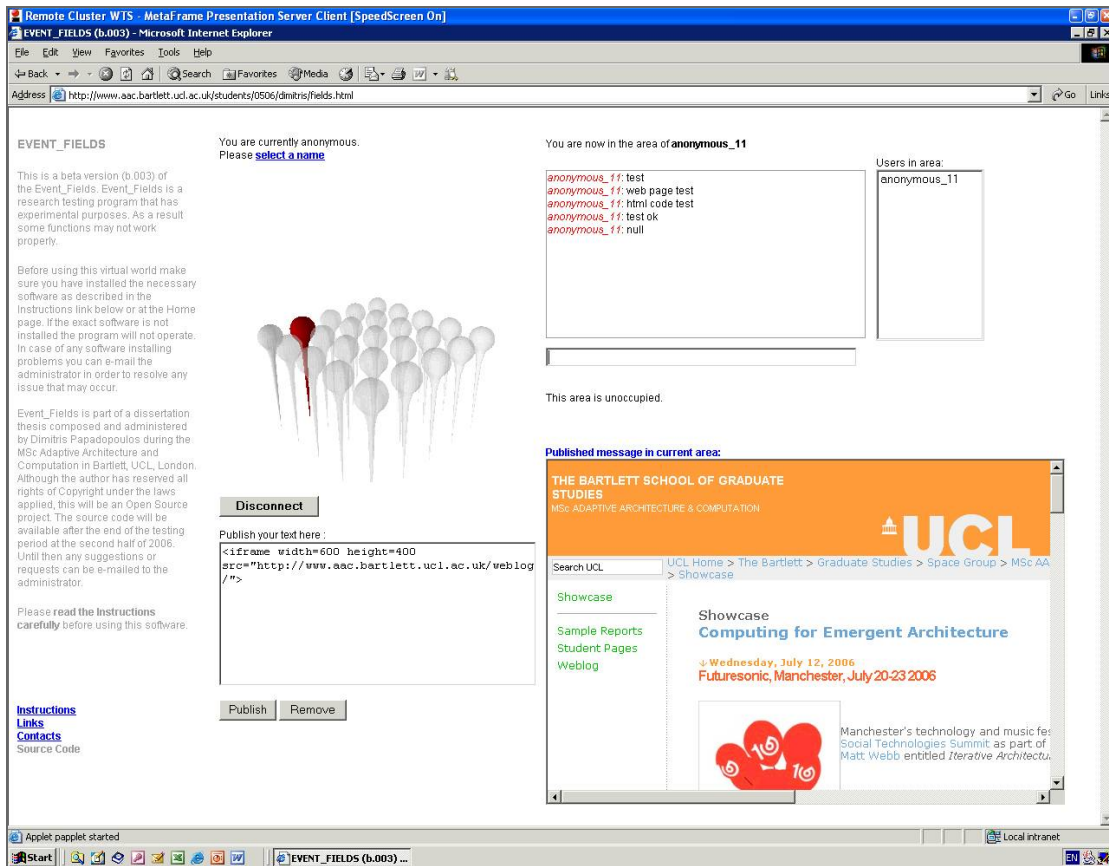
img 5



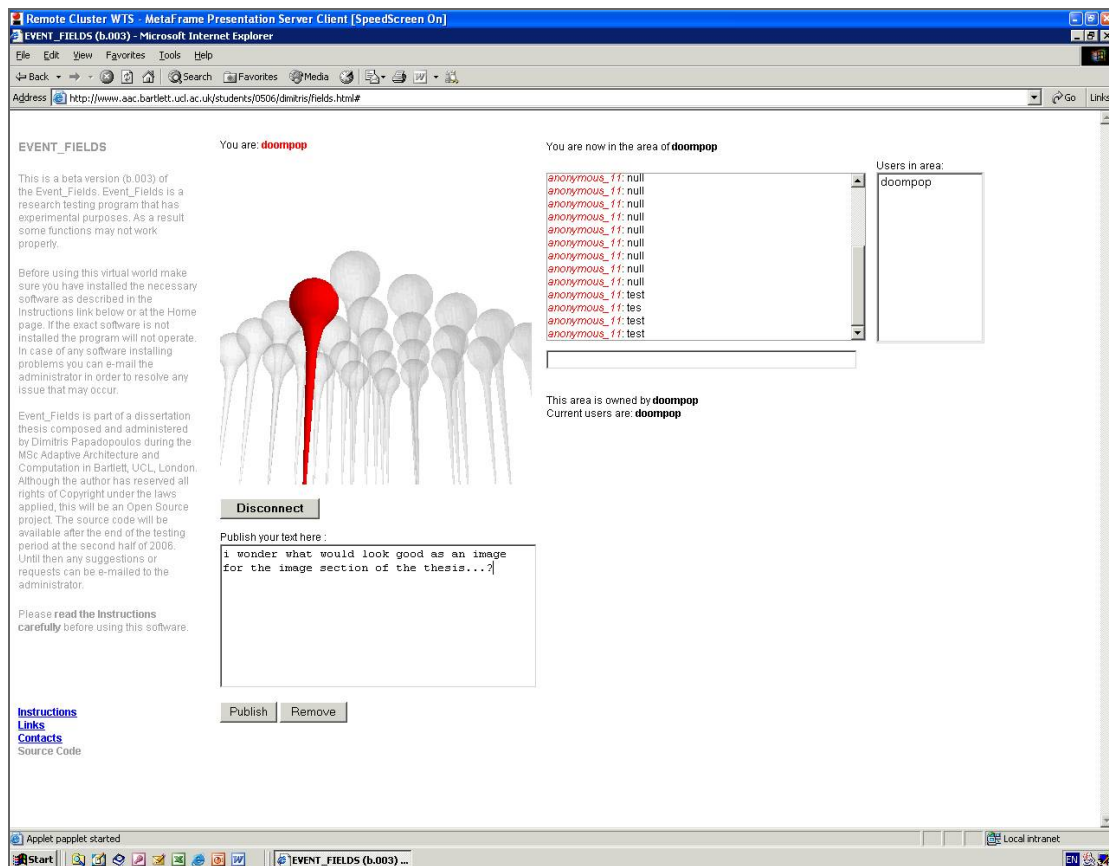
img 6



img 7



img 8



img 9

Remote Cluster WTS - MetaFrame Presentation Server Client [SpeedScreen On]
EVENT_FIELDS (b.003) - Microsoft Internet Explorer
Address http://www.aac.bartlett.ucl.ac.uk/students/0506/dimitris/fields.html#

EVENT_FIELDS

You are: **doompop**

You are now in the area of **doompop**

This is a beta version (b.003) of the Event_Fields. Event_Fields is a research testing program that has experimental purposes. As a result some functions may not work properly.

Before using this virtual world make sure you have installed the necessary software as described in the Instructions link below or at the Home page. If the exact software is not installed the program will not operate. In case of any software installing problems you can e-mail the administrator in order to resolve any issue that may occur.

Event_Fields is part of a dissertation thesis composed and administered by Dimitris Papadopoulos during the MSc Adaptive Architecture and Computation in Bartlett, UCL, London. Although the author has reserved all rights of Copyright under the laws applied, this will be an Open Source project. The source code will be available after the end of the testing period at the second half of 2006. Until then any suggestions or requests can be e-mailed to the administrator.

Please read the Instructions carefully before using this software.

[Instructions](#)
[Links](#)
[Contacts](#)
Source Code

Disconnect

Publish your text here:

was situated. The lights assigned to the scene by default included a spot light projecting from 45 degrees. These characteristic created shadows on the objects, providing the only orientation attribute of the space (img 10). I have chosen to limit the lights only to this default one as more lights were lighting up the shadows, erasing any orientation feeling.

Users in area:
doompop

This area is unoccupied.

Published message in current area:
When entering the site the user's space was turning into the color red and the space started to vibrate in order to indicate the position more clearly (img 8). For him he would always be red or when he published information dark red (img 9). Anyone else who logged was light blue for the user (img 10), except if they published something so they would be assigned the color green (img 11). It became obvious that if the user was assigned the color green and he published something then it would be impossible to tell by looking the space where his space was situated. The lights assigned to the scene by default included a spot light projecting from 45 degrees. These characteristic created shadows on the objects, providing the only orientation attribute of the space (img 12). I have chosen to limit the lights only to this default one as more lights were lighting up the shadows, erasing any orientation feeling.

Publish Remove

Applet papplet started
Start [EVENT_FIELDS (b.003) ... Local intranet

img 10

Remote Cluster WTS - MetaFrame Presentation Server Client [SpeedScreen On]
EVENT_FIELDS (b.003) - Microsoft Internet Explorer
Address http://www.aac.bartlett.ucl.ac.uk/students/0506/dimitris/fields.html#

EVENT_FIELDS

You are: **dimitris**

You are now in the area of **angela**

This is a beta version (b.003) of the Event_Fields. Event_Fields is a research testing program that has experimental purposes. As a result some functions may not work properly.

Before using this virtual world make sure you have installed the necessary software as described in the Instructions link below or at the Home page. If the exact software is not installed the program will not operate. In case of any software installing problems you can e-mail the administrator in order to resolve any issue that may occur.

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Please read the Instructions carefully before using this software.

[Instructions](#)
[Links](#)
[Contacts](#)
Source Code

Disconnect

Publish your text here:

Hello everybody this is the first official release of Event_Fields!

To be classified as a planet an object has to orbit the sun, have sufficient mass for its own gravity to make it roughly spherical and it must clear the neighbourhood around its orbit. It is the third criterion that is being targeted by those who would see Pluto reinstated as a

Users in area:
angela
dimitris
Amy

This area is unoccupied.

Publish Remove

Applet papplet started
Start [EVENT_FIELDS (b.003) ... Local intranet

img 11

Remote Cluster WTS - MetaFrame Presentation Server Client [SpeedScreen On]
EVENT_FIELDS (b.003) - Microsoft Internet Explorer
Address http://www.aac.bartlett.ucl.ac.uk/students/0506/dimitris/fields.html#

EVENT_FIELDS

You are: **bubblewatcher**

You are now in the area of **anonymous_6**

Users in area:
anonymous_6
bubblewatcher

This area is owned by **xenofon**
It is currently empty

Disconnect

Publish your text here:
bubble watcher is watching you

Publish Remove

Instructions
Links
Contacts
Source Code

Applet papplet started

img 12

Remote Cluster WTS - MetaFrame Presentation Server Client [SpeedScreen On]
EVENT_FIELDS (b.003) - Microsoft Internet Explorer
Address http://www.aac.bartlett.ucl.ac.uk/students/0506/dimitris/#

EVENT_FIELDS

You are: **dimitris**

You are now in the area of **dimitris**

Users in area:
dimitris
Amy

This area is unoccupied.

Published message in current area:
The issue of the virtual as a term of philosophical analysis and creativity motive has been directly or indirectly explored by different authors. The main approaches that will be studied here is those of Pierre Levy, through his interpretations and studies of the work of Gilles Deleuze and Michel Serres. Levy's interpretation of the notion of the virtual as studied in his book *Le Qu'Est-ce que le virtuelle?* is the one that fundamentally transcends this paper's venture. Apart from clearly defining the notion of virtuality as a different state of being from this of being actual, he offers multiple examples that help to realize the implications of a new way of perceiving reality as a virtual reality. Helpful in this task will be the texts from Antoine Picon whose studies as an engineer, architect, and historian of science and art provide accurate and discernible information on the past and present of virtual and virtuality.

Henri Bergson, being a mathematician, philosopher and humanitarian, during transitional years between the 19th and 20th century, is considered as one of the most important influences considering studies about time. The ways that his approaches about complexity and the virtual have been explored by Deleuze provide an inspiring framework which helps the researcher to re-evaluate the extensions of virtual in the designing process. In addition the work of Leibniz, one of the most famous mathematicians and philosophers of history, will be argued in the paper as being of immense influence on the contemporary way of design thinking through the work of Gilles Deleuze.

Along with the above, of great help will be the consultation of the experienced historical view of Manuel Castells and Manuel De Landa, two studious minds who try in their works and approaches to deal with complexity as a beneficiary state of multiple opportunities instead of trying to lower it to a countable quantity of discreet elements by indulging in an Anglo-Saxon structuralistic technique. Those two, by being able to juxtapose examples from different societies and contradictory cultures, provide a prolific source of informations and inspirations, considering the different notions that are studied in this paper.

design have been consulted from the webpage of the Postgraduate Course on Architecture and Information Technology of the School of Architecture at the National Technical University of Athens, by the title "Interaction Design" (<http://www.ntua.gr/archtech/interaction-design/inter-arch.htm>) coordinated by the professor Dimitris Papalexopoulos.

Disconnect

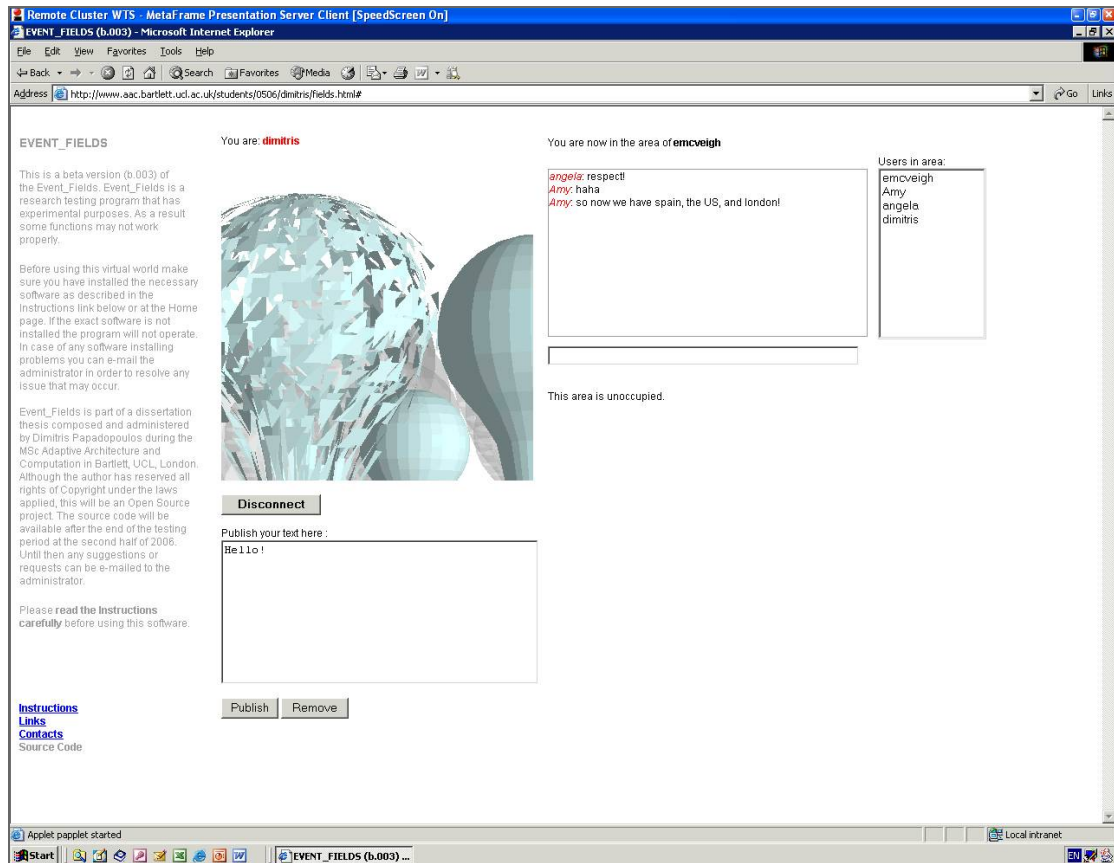
Publish your text here:
design have been consulted from the webpage of the Postgraduate Course on Architecture and Information Technology of the School of Architecture at the National Technical University of Athens, by the title "Interaction Design" (<http://www.ntua.gr/archtech/interaction-design/inter-arch.htm>) coordinated by the professor Dimitris Papalexopoulos.

Publish Remove

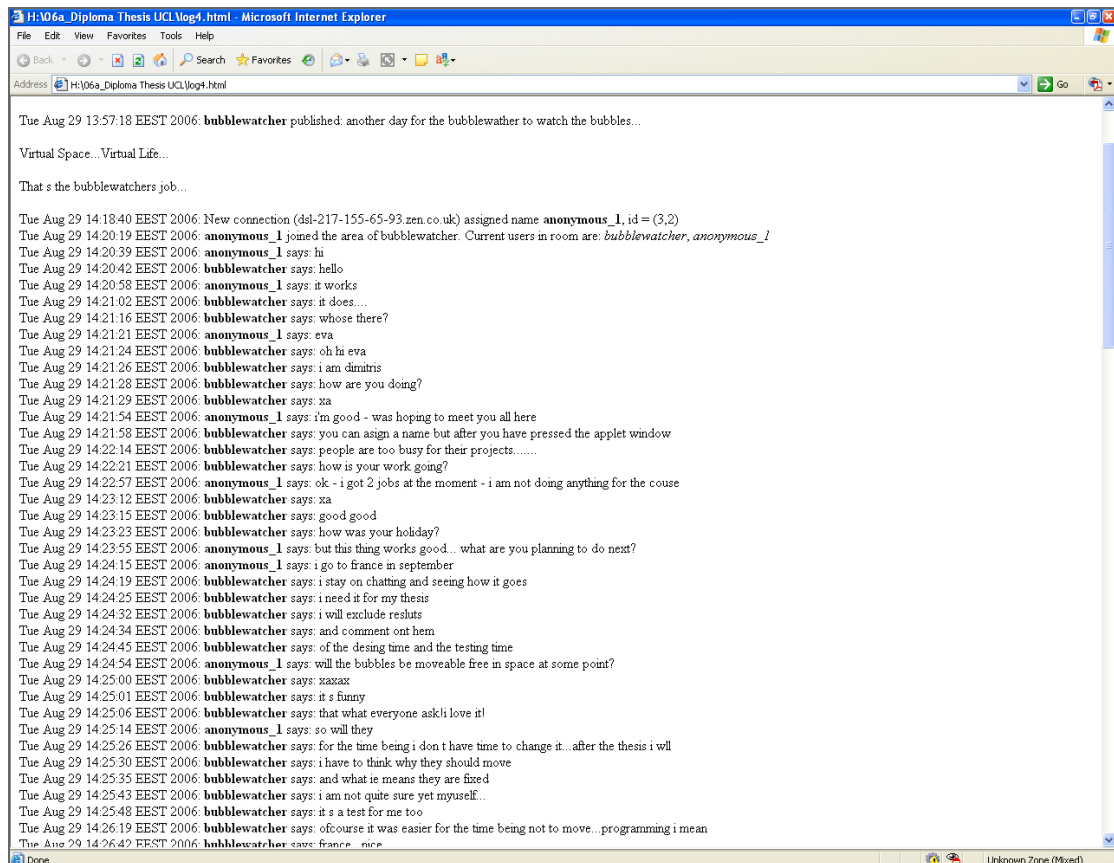
<<<HOME

Applet papplet started

img 13



img 14



CODE SNAPS

code 1

```
...
for ( line = 1 ; ; line++ )
{
    str = r.readLine();
    if ( str == null ) break;
    str = str.trim();
    if ( str.length() == 0 || str.startsWith( "#" ) ) continue;

    // Read vectors
    if ( str.startsWith( "v " ) ) {
        data = str.split( " " );
        points = new Vector3d( scale * float( data[2] ), scale * float( data[ 3 ] ), scale * float( data[ 4 ] ) );
        v_coords.add( points );
        continue;
    }

    // Read lines
    if ( str.startsWith( "f " ) ) {
        data = str.split( " " );
        links = new int[ 3 ];
        for ( int i = 0; i < 3; i++ )
        {
            tmp = data[ i+1 ].split( "/" );
            links[ i ] = int( tmp[ 0 ] );
        }
        v_links.add( links );
        continue;
    }
}
...
```

code 2

```
...
if ( standalone ) {
    model_file = "C:\\pinlight.obj";
}
else {
    model_file = getParameter( "modelFile" );
    if ( model_file == null ) model_file = "pinlight.obj";
}
xReadModel( model_file, v_coords, v_links, 1 );
connectToServer();
}
...
```

code 3

```
...
avoid mouseDragged() {
    if (mousePressed && mouseButton == RIGHT){
        cam0.arc(radians(mouseY - pmouseY));
        cam0.circle(radians(mouseX - pmouseX));
    }
    if (mousePressed && mouseButton == CENTER){
        cam0.zoom(radians(mouseY - pmouseY) / 2.0);
    }
}
}
...
```

code 4

```
...
void mouseMoved() {
    for ( int x = 0; x < x_max; x++ ) {
        for ( int z = 0; z < z_max; z++ ) {
            Polygon p = xGetModelPolygon( v_coords, x - x_max / 2, z - z_max / 2, 0, 10 );
            if ( p.inside( mouseX, mouseY ) ) {
                boolean fredraw = false;
                if ( sel_x != x || sel_z != z )
                {
                    fredraw = true;
                    sel_x = x; sel_z = z;
                    redraw();
                }
            }
        }
    }
}
...
```

code 5

```
...
Vector3d (float x, float y, float z) {
    this.x = x;
    this.y = y;
    this.z = z;
}

Vector3d project () {
    return new Vector3d(screenX(x,y,z),screenY(x,y,z), screenZ(x,y,z) );
}
...
```

code 6

```
...
// Give the new user a unique id
Id id = getNewUserId( client );
User user = users[ id.x ][ id.z ];
Room room = rooms[ id.x ][ id.z ];
...
```

code 7

```
...
// Create an anonymous user name
user.name = "anonymous_" + connectionsCount;
user.hasSetName = false;
connectionsCount++;
...
```

code 8

```
...
void setName( String name )
{
    win = JSObject.getWindow( applet );
    Object[] obj = new Object[ 1 ];
    obj[ 0 ] = name;
    win.call( "setName", obj );
}
...
```

code 9

```
...
void informAboutRoom( Room room )
{
    win = JSObject.getWindow( applet );
    Object[] obj = new Object[ 1 ];
    String msg;

    if ( room == null ) {
        msg = "This area is unoccupied.";
    }
    else {
        msg = "This area is owned by <b>" + room.owner + "</b><br>";
        if ( room.users.isEmpty() ) {
            msg += "It is currently empty";
        }
        else {
            msg += "Current users are: ";
            for ( int i = 0; i < room.users.size(); i++ ) {
                msg += "<b>" + (String)room.users.get( i ) + "</b>, ";
            }
            msg = msg.substring( 0, msg.length() - 2 );
        }
    }

    obj[ 0 ] = msg;
    win.call( "informAboutRoom", obj );
}
...
```

code 10

```
...
public void log( String msg )
{
    String now = new Date().toString();
    msg = now + ": " + msg + "<br>\n";
    if ( logFile == null ) {
        System.out.println( msg );
        return;
    }
    try {
        logFile.write( msg );
        logFile.flush();
    }
    catch ( Exception e ) { logFile = null; }
}
...
```

code 11

```
...
import netscape.javascript.JSObject;
JSObject win = JSObject.getWindow( this );
Object params[] = new Object[] { param1, param2, ... };
win.call( 'functionname', params );
...
```

code 12

```
...  
<applet id="papplet" name="papplet" code="event_fields_1"  
archive="event_fields_1.jar">  
...
```

code 13

```
...  
if ( cmd.equalsIgnoreCase( "NAME" ) )  
    {  
        cmdName( user, str, tok );  
        return;  
    }  
...
```

code 14

```
...  
if ( cmd.equalsIgnoreCase( "JOIN" ) )  
    {  
        cmdJoinArea( user, str, tok );  
        return;  
    }  
....
```

code 15

```
...  
if ( cmd.equalsIgnoreCase( "SAY" ) )  
    {  
        cmdSay( user, str, tok );  
        return;  
    }  
....
```

code 16

```
...  
if ( cmd.equalsIgnoreCase( "POST" ) )  
    {  
        cmdPost( user, str, tok );  
        return;  
    }  
...
```

code 17

```
...  
if ( cmd.equalsIgnoreCase( "READ" ) )  
    {  
        cmdRead( user, str, tok );  
        return;  
    }  
...
```

code 18

```
...
if ( cmd.equalsIgnoreCase( "CLEAR" ) )
    {
        cmdClear( user, str, tok );
        return;
    }
....
```

code 19

```
...
if ( cmd.equalsIgnoreCase( "ID" ) && tok.countTokens() >= 2 )
    {
        myname = tok.nextToken();
        x = int( tok.nextToken() );
        z = int( tok.nextToken() );

        myroom = new Room( x, z );
        myroom.users.add( myname );
        rooms[ x ][ z ] = myroom;
        current_room = myroom;

        System.out.println( "I AM: " + x + ", " + z );
        return;
    }
...
```

code 20

```
...
if ( cmd.equalsIgnoreCase( "NAME" ) && tok.countTokens() >= 1 )
    {
        System.out.println( "Got name" );

        // Remove old name from current room's contents
        myroom.users.remove( myname );

        // Change my name, and update room's contents
        myname = tok.nextToken();
        myroom.users.add( myname );
        myroom.owner = myname;

        if ( USE_APPLET ) js.setUserName( myname );
        return;
    }
...
```

code 21

```
...
if ( cmd.equalsIgnoreCase( "SAY" ) )
    {
        String who = tok.nextToken();
        String what = tok.nextToken( "" );
        println( who + ": " + what );
        if ( USE_APPLET ) js.say( who, what );
        return;
    }
...
```


code 22

```
...
if ( cmd.equalsIgnoreCase( "BOARD" ) )
{
    x = int( tok.nextToken() );
    z = int( tok.nextToken() );
    int bid = int( tok.nextToken() );
    msg = tok.nextToken( "" );
    println( "Read message: " + msg );
    if ( rooms[ x ][ z ] == null ) return;
    rooms[ x ][ z ].boardId = bid;
    rooms[ x ][ z ].board = msg;
    if ( rooms[ x ][ z ] == current_room && USE_APPLET ) js.showPublishedData( msg );
    return;
}
...
```

code 23

```
...
if ( cmd.equalsIgnoreCase( "WARN" ) )
{
    msg = tok.nextToken( "" );
    System.out.println( "Warn: " + msg );
    if ( USE_APPLET ) js.warn( msg );
    return;
}
...
```

(London, September 15 2006)