Entertainment Computing, Social Transformation and the Quantum Field

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Abstract. The abstract should summaritinment computing is on its way getting an established academic discipline. The scope of entertainment computing is quite broad (see the scope of the international journal Entertainment Computing). One unifying idea in this diverse community of entertainment researchers and developers might be a normative position to enhance human living through social transformation. One possible option in this direction is a shared 'conscious' field. Several ideas about a new kind of field based on quantum effects are presented and discussed. Assuming that social transformation is based on a shared collective unconscious I propose designing entertainment technology for a new kind of user experience that can transform in a positive manner the individual unconscious and therefore the collective unconscious as well. Our ALICE project can be seen as a first attempt in this direction.

Keywords: culture, social responsibility, entertainment, computing, quantum field.

1 Introduction

The scope of the research and development arena 'entertainment computing' is quite broad[1]: computer, video, console and internet games; digital new media for entertainment; entertainment robots; entertainment technology, applications, application program interfaces, and entertainment system architectures; human factors of entertainment technology; impact of entertainment technology on users and society; integration of interaction and multimedia capabilities in entertainment systems; interactive television and broadcasting; methodologies, paradigms, tools, and software/hardware architectures for supporting entertainment applications; new genres of entertainment technology; simulation/gaming methodologies used in education, training, and research. A remaining question is how to bring this community together based on shared and hopefully unifying ideas? In Nakatsu, Rauterberg and Vorderer [20], Nakatsu, Rauterberg and Salem [19] and Rauterberg [27] we started to sketch the scene. I discussed in Rauterberg [25,26] the pros and cons of games and social behaviour worldwide: while in Western countries the discussion is focussing on violent game and media content, the discussion in Asia is on intensive game usage and the impact on the

[1] See at www.elsevier.com/locate/inca/717010.

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intellectual development of children. A lot is already discussed on the harmful and negative effects of entertainment technology on human behaviour; therefore we decided to focus primarily on the positive effects. In Rauterberg [25,26] a first overview over positive effects of entertainment technology on human behaviour is presented and discussed. The drawn recommendations can support developers and designers in entertainment industry. This paper tries to go a step further by including the idea of social transformation (Drucker [6]). Engeström [8] argues for the mediating effect of activities with and around artefacts. In the scope of his paper we can look at entertainment technology as an important mediating factor to influence social transformations.

2 How Can Social Transformation Be Achieved?

Van Loon [31] relates an analysis of risk arising from electronic media to that of a transformation in the societal organization of aesthetic experience. His central assumption is "that particular risks cannot be understood independently from the media by which they have been generated" (p. 166). The sets of connections electronic communications have made possible have amplified not only our capacity to transcend many of the physical limitations of spatio-temporal relations, but also fundamentally transformed the sense of being human. Van Loon argues that in the age of cybernetic reproduction it is no longer helpful or adequate to discuss risks in term of reality versus representation. The notion of 'virtual risks' could be used to discuss the relationships between science, politics, economics, law, the media and popular culture as part of one and the same complexity of connections. Van Loon argues that by following mechanical reproduction and extending it into the organic realm itself, informational reproduction implies a fundamentally new moment. The unity beneath the old dualism between humanism and technocracy needs to be exposed as unethical! We currently face the most critical virtual risks: the death of the human. He concludes: let us "cultivating a responsive sensibility to effect a disclosure of the transgressive implications of the mediation of technology (...) on subjective and biographic experiences" (p. 180).

Maton [16] proposes a multidisciplinary and multilevel framework for social transformation, encompassing the following foundational goals: (1) capacity-building, (2) group empowerment, (3) relational community-building, and (4) culture-challenge. He presents and discusses examples to illustrate the synergistic relationship among the four foundational goals, which is the core of the social transformation process. He concludes with three challenges to guide our efforts to build the new century: "(1) to move social transformation to the center of our consciousness as a field; (2) to articulate jointly with allied disciplines, organizations, and citizen groups an encompassing, multidisciplinary, and multilevel framework for social transformation; and (3) to do the above with heart, soul, and humility" (Maton [16] p.25).

In passing from history to nature, myth acts economically: it abolishes the complexity of human acts, it gives them the simplicity of essences, it does away

with all dialectics, with any going back on what is immediately visible, it organizes a world which is without contradiction because it is without depth, a world which is open and wallowing in the evident, it establishes a blissful clarity: things appear to mean something by themselves. If we think that the heterogeneous, polyvalent world is a separate structure in its own right, law is disruptable; i.e., the carnival can be held on the church steps. But if this is not the case, if the carnival and the church do not exist independently of each other, then the only way we can challenge the church is from within an alternative symbolic universe. We cannot choose the imaginary, the semiotic, the carnival as an alternative to the law. It is set up by the law precisely in its own ludic space, its area of imaginary alternative, but not as a symbolic alternative. So that, politically speaking, it is only the symbolic, a new symbolism, a new law that can challenge the existing dominant law.

According to Mulvey [18] are three different change processes: (1) order and disorder, (2) liminality, (3) festivals of the oppressed (e.g. carnival). I will focus on (2): Rituals guide an individual through the transitional moments of life, marking the disruption and difficulty of change and reintegration back into the ordered life of a community. There are rites of separation that initiate the process and put the person concerned into a state of privilege or crisis outside the norms of everyday existence. These are followed by transitional rites, during which the person is in a liminal relation to the world, in a no-man's-land, that may well be marked literally by a particular relationship to place ('transitional periods that require a certain autonomy'). These rites are followed by those of re- incorporation.

Liminal and trance are altered states of consciousness which individuals can enter through a variety of techniques, including hypnotism, drugs, sound (particularly music, percussive drumming etc.), sensory deprivation, physical hardships (eg. flagellation, starvation, exhaustion) and vigorous exercise (particularly dance). People can also use trance, particularly in the context of 'ritual' events, to learn new strategies of thinking or of relating to one another. There are different types of learning: for example 'conscious learning' is a transaction between consciousness, the environment and memory; and 'unconscious learning', which takes place with the addition of 'outer' and 'inner' ways of learning. These arise through the interaction of consciousness with transpersonal mass/collective consciousness (e.g. Jung's [13] "collective unconscious"). The feedback link between consciousness and unconsciousness gives rise to inner experiential learning or tuning-in to the dynamics of meta-systems transcending man and his immediate environment. It may be enhanced by various techniques, mostly developed in connection with Eastern philosophies (e.g. Jantsch and Waddington, Varela, Thompson and Rosch [12,32]). As the arguments concerning the attainment of liminal and trance states indicate, it is often an advantage to utilize the whole body in order to achieve them; consciousness is a function of the body as a whole neuronal and bio-chemical energy system. Consciousness involves both sensory feedback mechanisms and imaginative practices based in fields of signification which are culturally determined. Significant mental effects can be obtained when the entire physical organism is utilised.

There are several phenomena like psycho kinesis, telepathy, out-of-body experiences, unidentified flying objects, near death experience, time travel, etc. that are waiting for some explanations (Talbot [29]). Despite its apparent materiality, the universe looks like a kind of 4-D projection and is ultimately no more real than a hologram, a 4-D image projected in space and time. Using this holographic model Talbot [29] has developed a new description of reality. It encompasses not only reality as we know it, including hitherto unexplained phenomena of physics, but is capable of explaining such occurrences as telepathy, paranormal and out-of-the-body experiences, 'lucid' dreaming and even mystical and religious traditions such as cosmic unity and miraculous healings.

Mitchell [17] believes that all psychic phenomena involve nonlocal resonance between the brain and the quantum vacuum, and consequent access to holographic, nonlocal information. In his view, this hypothesis could explain not only psycho kinesis and extra sensorial perception, but also out-of-body and near-death experiences, visions and apparitions, and evidence usually cited in favor of a reincarnating soul. One has to admit that these theories are often seen as speculative and not yet part of main stream science.

3 A 'Conscious' Field and Quantum Physics

Turing used the concept 'machine' for describing mechanical processes and did not emphasize any distinction between a human 'worker-to-rule' and a physical system. If Turing was thinking about mental operations, it is unclear what he thought the brain was doing when it saw the truth in a manner that could not be modeled computably. Turing explained the principle that his universal machine could simulate any machine, if the behavior of these machines is in principle predictable by calculation, in contrast to the indeterminacy principle in quantum mechanics where such kind of predictions is even theoretically impossible. At the end of his life he came up with his 'Turing Paradox': that the standard principles of quantum mechanics imply that in the limit of continuous observation a quantum system cannot evolve. Turing's 'paradox (also know as the 'watched pot problem') in quantum measurement theory, is now called the *quantum Zeno effect* (Itano, Heinzen, Bollinger & Wineland [11]). This effect is relevant to the new technology of quantum 'interaction free measurement' (Hodges [9]). The quantum Zeno effect states that if we find a system in a particular quantum state, and repeatedly check whether it is still in that state, it will remain in that state. The watched quantum pot never boils (Vaidman [30]). This looks as if human actions -although indirectly- can have an influence on quantum states (Nelson et al [24]). Recent experimental evidence in physics suggests quantum non-locality occurring in [sub]conscious and unconscious brain function, and functional quantum processes in molecular biology are becoming more and more apparent. Moreover macroscopic quantum processes are being proposed as intrinsic features in cosmology, evolution and social interactions (Nelson [21,22,23]).

Quantum and vacuum physics shows that there is an *interconnecting layer* in nature, beyond the connectivity we are familiar with. Einstein claimed that no connection between particles can be achieved beyond light speed (the 'local' hypothesis); on the other side it seems to be possible to synchronize quantum states immediately (the 'non-local' hypothesis; see Aspect et al [2,3], Aspect [1]). Bohm [4] laid most of the theoretical foundations for the Einstein, Podolsky and Rosen [7] experiments performed by Aspect et al [2,3]. These experiments demonstrated that if two quantum systems interact and then move apart, their behavior is correlated in a way that cannot be explained in terms of signals traveling between them at or slower than the light speed. This phenomenon is known as *non-locality*, and is open to two main interpretations: (1) it involves unmediated, instantaneous action at a distance, or (2) it involves faster-than-light signaling. For if nonlocal connections are propagated not at infinite speeds but at speeds greater than that of light through a 'quantum ether' (a sub-quantum domain where current quantum theory and relativity theory break down) then the correlations predicted by quantum theory would disappear if measurements were made in periods shorter than those required for the transmission of quantum connections between particles. The alternative position is that information always takes time to travel from its source to another location, that information is stored at some para-physical level, and that we can access this information, or exchange information with other minds, if the necessary conditions of 'sympathetic resonance' exist (see also the 'morphic resonance' concept of Sheldrake [28]).

As for *precognition* one possible explanation is that it involves direct, 'non-local' access to the actual future. Alternatively, it may involve a new kind of perception (beyond the range of ordinary perception) of a probable future scenario that is beginning to take shape on the basis of current tendencies and intentions, in accordance with the traditional idea that coming events cast their shadows before them; such foreshadowing takes place deep in the implicate order which some mystical traditions would call the astral or Akashic realms (Laszlo [14]). We can assume that there eventually exists an interconnecting cosmic field at the foundation of reality that conserves and conveys information. This cosmic field looks like a possible candidate for our required 'supranatural' memory. Recent discoveries in the field of vacuum physics show that this Akashic field is real and has its equivalent in the zero-point field that underlies space itself. This field consists of a subtle 'sea of fluctuating energies' from which all things arise: atoms and galaxies, stars and planets, living beings, and even [un]consciousness. This zero-point Akashic-field is not only the original source of all things that arise in time and space; it is also the constant and enduring memory of the universe. It holds the record of all that ever happened in life, on Earth, and in the cosmos and relates it to all that is yet to happen.

4 Discussion and Conclusions

We started the cultural computing project ALICE as an interactive, entertaining experience (see Nakatsu, Rauterberg & Vorderer [20]) inspired from 'Alice

in Wonderland' (Carroll [5]). In the scope of this project interactive adventures are experiences provided by an augmented reality environment based on selected parts from Lewis Carroll's book 'Alice's Adventures in Wonderland'. The user assumes the role of Alice and explores this interactive narrative. ALICE is an exploration of interactive story-telling in augmented reality (Hu et al [10]). By exploiting the unique characteristics of augmented reality compared to established media such as film and interactive media, the project uses augmented reality as a new medium for edutainment and entertainment as a particular carrier for cultural transformations. Innovations include the refashioning of conventions used in film and interactive tools for the development of an augmented reality narrative, and the use of simple artificial virtual and real characters (avatar and robot respectively) to create an immersive interactive experience.

In ALICE real and virtual agents (i.e. rabbit and caterpillar robot, Cheshire cat) act as characters who lead the user through virtual and real locations, moral choices and emotional states. The narrative is a surreal quest, sometimes funny, sometimes disturbing. The character White Rabbit (representing the concept of time) introduces him and joins with the user in a series of absurdist challenges. ALICE is an educational journey towards the user's heart's desire, designed to provoke self-reflection on a number of other issues: bullying and trusting others; selfish- and selflessness; enjoying the moment or sublimating pleasure. The user is given the opportunity to occupy and experience any of these mental and emotional positions. ALICE can be used to give interesting examples of many of the basic concepts of adolescent psychology. Alice's experiences can be seen as symbolic depictions of important aspects of adolescent development, such as initiation, identity formation, and physical, cognitive, moral, and social development (Lough [15]). Alice's adventures are de- and reconstructive in nature and as such are directly challenging the strongly held belief of a linear, single track and sequential reality.

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