Parallel Session D
Digital-Media & Information Technology for Creative Communities

LIFeSCAPE

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ABSTRACT

A map is a "way of opening up space through information". Imagine leaving digital traces on that space while wearing a video recording device enhanced by sensors. This work presents a conceptual design project, Lifescape, and the theoretical approaches around it within the context of digital media and creative societies. The points of departure are a technology that provides automatic segmentation and classi?cation of video data supplemented by sensors, and an online network to share this video data with other people. In this paper we shall introduce our theoretical approaches to interface design of Lifescape system, which connects the actuality and virtuality of the user's and society's lives.
*   **Keywords:** social computing, online networks, data visualization, persuasion, surveillance, wearable computing*

INTRODUCTION

A map is a *"way of opening up space through information"*. Imagine leaving digital traces on that space while wearing a video recording device enhanced by sensors. How can this video archive, segmented by contextual sensor data, be visualized on an online social network? How can this layered information be fused and create new dimensions between actual and virtual?

First, the location and movement of the people in a space are engraved on the geographical map. Second, these paths are segmented - similarly as the video material - and colorized revealing what activities took place. Here it is essential to remove geographical information in order to highlight the abstracted map of activity. Third, nests of personal networks are situated either distant or near to each other revealing relations among users in a space and their activities.

The city is an enormously dynamic mechanism, which incorporates variable patterns of movement, occupation, and density. The network functions like a living organism within the city and "recreates" maps by unfolding on geographical representations, reforming locations, activities and human connections.

Tackling these issues, a conceptual design project, Lifescape, residing in a development phase will be outlined in this paper. It tells the story behind a concept introducing an up to now non-existent technology for sharing, searching and tagging video content, mapped on non physical space, within an online virtual community. The main goal will be the integration of engineering research and the design of an interface framework for possible use in future social computing projects.

CONTEXT

Marshall McLuhan, in 1962 used the term "global village"[1] to describe that by eliminating partly the values of time and space mass media will affect communication and interaction among humans on a global scale. With such a statement one can say that he predicted the development of the Internet and gave new perspectives on physical space within the network discourse. Nowadays different techniques like user generated content, collaborative platforms, social book-marking, etc. alter the long year model of the Internet and introduce social computing fundamentals into the global virtual space. McLuhan's vision becomes reality as web 2.0 emerges. Web communities are the absolute trend and sharing platforms a widespread tool for interaction and ex-change. Social networks develop beyond space, connecting people from almost everywhere around the world. As they evolve, real life clues are introduced into the network. Locative information is translated into the virtual realm to strengthen the physical, material feel of communities, support communal awareness and form the notion of space. In this context the relationship between physical and digital is becoming increasingly important. Words like digital, virtual, intangible or augmented space identify and merge new "forms" of space.

Lev Manovic, talking about the augmented space mentions that it consists of "overlaying layers of data over the physical space". He uses the term 'augmented space' to refer to this new kind of space which is slowly becoming a reality. "Video surveillance is becoming ubiquitous... video and other types of surveillance technologies translate the physical space and its dwellers into data...Some data may come from global networks such as Internet; some may be imbedded in objects located in the space around the user" [2]. The panoptic principle turned out to be a pleasure principle according to Peter Weibel [3]. Did the impact of recording devices shifted the notion of surveillance from monitoring to entertainment, expanding it from the TV screen to the Internet? As online communities emerge, evolve and expand the dynamics of user involvement and participatory content is attracting massive attention.

On the other hand, Paul Virilio stresses, that, "These new technologies try to make virtual reality more powerful than actual reality, which is the true accident. The day when virtual reality becomes more powerful than reality will be the day of the big accident. Mankind never experienced such an extraordinary accident." [4]

Virilio determines the term 'accident', as the opposed face of progress on a coin. Additionally to his bleak view, technological development could impose the loss of aesthetic and creative development since "Totalitarianism is latent in technology"[5]. In an era, which is still based on post-WW2 science and military-industrial complex, is it possible to find signs of creativity instead of destruction?

The graphic-designer and computer scientist John Maeda argues,
"My evolved focus is on the global economy, and how creativity might reshape our society. I hope that a world that endears the arts just as much as it endears its weapons of destruction might be able to enjoy this century to the fullest. We can either just watch what happens, or commit to shaping the events that will come. I choose the latter along with many colleagues all around the world." [6]

Nowadays relative low-budget computer technologies such as Internet, twenty-four-hour video recording, databases with broad capacity and improved algorithmic segmentation for classifying and tagging data, GPS tracking, face detection, and body-worn sensors are widely available, although initially they have been applied mostly for military and security interests. The question is, if it is possible to assemblage those potentials and introduce them in a more communicative, participatory and creative context. A discourse had been stimulated the last year for a Master Project in Bremen. Sensitive issues of surveillance and control against entertainment and creativity were put forward among people from diverse backgrounds, such as engineers, artists, designers.

Project Description and Background

The project herein is build up by joining two projects of the Bremen University of the Arts and Bremen University as a part of the graduate program Digital Media. We are an interdisciplinary group consisting of 12 international members with backgrounds in fine arts, computer science, visual communication and product design. The project ended in April 2008 even though it created various directions for further development and research as 'unfinished' concept.

Our field of work derived from two main topics. The first deals with scanning a large collection of video that is automatically segmented via sensor fusion methods. Through analysis of supplementary context information in the form of sensor data streams the material can be assembled according to objects of interest (faces, people, objects, locations, events and activities). Context information includes GPS position, face recognition, sound detection and temperature, heart rate and light condition. Such a technology does not exist to this point and the evaluation of its potential along with its creation is part of our goals. The video material is obtained through an always-on body-worn device, thus implying the careful handling of surveillance and privacy matters. The second point of departure is the research in persuasive technologies within the context of social computing [7]. In contrast to the first topic, this one deals primarily with design methodologies and best practices.

It was a challenge to determine both the technical feasibility of the envisioned video segmenting technology and its deployment for concrete applications. The combination of both concepts brings about the question of how individually produced segmented video along with contextual information can be used within the virtual realm of the Internet in a social computing situation. How the physical gets translated and used in the digital; how a virtual network can be influenced or even persuaded by the visualization of authentic real-life interdependencies; how the content on a digital map can overcome its time constraint by adding the constant inflow of time based material.

One of the core utilities of the envisioned software is to share and search video and personal information in an online social network. We consider the video segmented material to be a substitute of the user's identity.

Concept

Tracking movement, illustrating relations and extracting meaning is eminent for both simulating and stimulating the social development. It becomes clear that data visualization is currently taking the leading role in the creation of experimental representation focusing on space matters along with the connections of the people beyond space. Visualizing techniques incorporate heterogeneous types of data into the same context, having as a result the development of alternative browsers and representation of information. *(See Figure 1)*

a. The Network

> *"...In Ersilia, to establish the relationships that sustain the city's life, the inhabitants stretch strings from the corners of the houses, white or black or gray or black-and-white according to whether they mark a relationship of blood, of trade, authority, agency. When the strings become so numerous that you can no longer pass among them, the inhabitants leave: the houses are dismantled; only the strings and their supports remain. From a mountainside, camping with their household goods, Ersilia's refugees look at the labyrinth of taut strings and poles that rise in the plain. That is the city of Ersilia still, and they are nothing. They rebuild*

Ersilia elsewhere. They weave a similar pattern of strings, which they would like to be more complex and at the same time more regular than the other. Then they abandon it and take themselves and their houses still farther away. Thus, when traveling in the territory of Ersilia, you come upon the ruins of abandoned cities, without the walls which do not last, without the bones of the dead which the wind rolls away: spider webs of intricate relationships seeking a form..." ["Invisible Cities", Italo Calvino, 1978]

In 1996 Jenny Ringley started broadcasting live video from her dormitory room over the Internet labeled as JenniCam [8]. She extended the web by one additional dimension: "my room in cyberspace". As the camera extends the human body into the geo-spatial domain, personal moments or events are detached from the physical space and time and mapped virtually. "Virtual Space is becoming the sphere of activity for the life of the mind" [9]. Trails of memory are structured and hyperlinked on maps. This can be regarded as the revival of Vannevar Bush's vision of Memex [10]. However in our design study we extend it in a broader geospatial and social context. The user becomes in a way the "Man with the moving Camera" [11] recording his everyday life even on the streets of a city.

The captured material becomes a personal archive of visual data, people, activities, and relations to be published and shared on a social online platform. This kind of multi-layered set of data needs to be visualized in a common and legible way by using simple interconnections within the system. In order to conclude from raw video material the system invites the user to tag and rate, not only her video but also the footage of others, thus highlighting personal interests. Moreover, by doing this one shapes his identity and creates correlations to different people.

By visualize relationships and activities; it is possible to enable articulation of subjective non-linear narrations of one's life or of group's shared moments. Instead of text as a means of communication, our system facilitates a more global language video and contextual information becoming the skeleton of the interface. The social network offers a bridge between the actual and virtual life. The user has her/his own perception of the tangible space, personal relationships and activities. This experience is filtered through algorithms and put into a visual language thus opening new possibilities for interpretation.

The interface suggests a platform that offers various perspectives of how one can see the own "point of view", in comparison to others' "points of view" providing a common ground for the persuasive element of social networks via surveillance. Though we ought to be careful and take into consideration the fact that "by tracking the user her mood, her pattern of work, her focus of attention, her interests, and so on these interfaces acquire information that they use to help the user with her tasks and automate them. This close connection between surveillance and assistance is one of the key characteristics of the high-tech society" [12].

The initial algorithmic segmentation makes an observation of repetitive behavioral patterns possible. In general, a platform is established for the time and space juxtapositions of similarities and differences between users. The sensor fusion and the combination of manually and automatically created tags have the main role of making these interrelations perceptible. Most of these relations emerge automatically and appear meaningful only after the user feeds and trains the system over a certain period of time. That is to say, all the facilities provided by the system converts the raw video material to meaningful patterns for the participants.

b. The Map
"Map is not a copy of space, but a way of opening up space through information" [13]

The core elements of the interface are time, space, human connections and activities. The map, here, is considered as a primary interface element, a key reference not only to geo-spatial data but also the plain of everyday human activity. While starting visualizing different case studies, static parts of a geographical information map seemed not the only important details to be represented on a city plan. Kevin Lynch mentions: "Moving elements in a city, and in particular the people and their activities, are as important as the stationary physical parts [...] While [the city] may be stable in general outlines for some time, it is ever changing in detail." [14] By abstracting the maps according to different values, it is possible to study different interrelations.

Considering the fact that the core material of the visual social network is video, segmented by algorithms (so meaning from this footage is extracted and translated to activities), human activity could be one the main principle of abstraction methodology.

Guy Debord in 1957 created the map of "The naked city" [15] depicting in a way the ephemeral nature of psycho-geographic space. "The Situationist"[16]. maps in turn become an archive of a specific moment in the life of the city. However, if these maps incorporated time, they would be able to show the migration or disappearance of these psycho geographic spaces, highlighting and critiquing the urban trends that were/are shaping the city. These maps uniquely propose a networked model in which spatial events are abstracted from the grid and linked according to their typology. As databases form the engines of the contemporary base map, the information they contain may be retrieved in multiple configurations, allowing for a range of methods for visualizing the space of the city". [17]

By recreating a map with a digital medium, elements like time can easily be incorporated. So one is able to see all the changes that happen in a city within a time span. The city is an enormously dynamic mechanism, which incorporates variable patterns of movement, occupation, and density. The network functions like a living organism on the city. The network "recreates" the map by unfolding on geographical representations, reforming locations, activities and human connections. Basic concept of the design approach is that the geographical information is translated into activity maps *[Picture 1]* or into private network maps. In this case one has to navigate through information material, which is video and not through road systems and block plans. Tagging information augments the representation of the physical corresponding to the digital. Remarkable can be how from a static plain, the representation of the city, becomes a dynamic interface that reveals the rhythms of the city according to the activities of the people. How such maps can change peoples' perceptions and movements in the physical space.

In this case the user as so-called flâneur [18] or the "painter" of digital life, while s/he is walking through the crowd, could record and link, not only mentally the gazes and the faces of the passerby, but literally, without forgetting them. According to Benjamin the flâneur's navigation transforms the space of the city, "The Crowd is the veil through which the familiar city lures the flâneur like a phantasmagoria. In it the city is now a landscape, now a room." `[19] If that room is, in Benjamin's words, the mind of the flâneur, the virtual space or the map should be transformed according to the user-flâneur perception. In this exchange of "glances" there is an intersubjectivity that always concerns one individual and her/his interaction within a group, even if this is a group of strangers. Every map should fit in the subjective view of the explorer.

CONCLUSION AND FURTHER DEVELOPMENT

The concepts presented in this paper provide an insight into the practice and reveal the primary topics of interest in Lifescape project. All digital domains entering our everyday lives fluctuate our ways of communication with our surroundings. Our comprehensions of time, space, and identity change as these technologies become ubiquitous. This alteration accelerates in a dynamic and non-linear way in the social development. Lifescape as a conceptual system could also function as a catalyst in the social progress with its scope from surveillance to persuasion, from identity to social networking. This theoretical and practical study is expanded with research on different levels of segmentation and archiving, especially focusing on the interplay of automated classification and collaborative human annotation. Experimental data-visualization, life-logging communities and social interface design form another field of research. This direction enables to realize, not just a huge database, but also a semantic 'map' that interrelates the user with location, community and activity. For further development the main goal would be the integration of social aspects, engineering research and the design of an interface framework for possible use in future social computing projects.

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Figure 1