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Everyday Visualization to Support a Sustainable Development

Abstract This workshop submission describes a recently initiated project intending to investigate how a combination of visualization techniques, context-aware technology and personal mobile devices could contribute to a sustainable development. The idea is to investigate how interactive visualization techniques can help consumers to make informed decisions about different products and their effect on the environment. As a consumer it is difficult to get a direct understanding of the complex global or local effects that a specific consumption choice can contribute to. With everyday visualization, we want to explore tools that can visualize such complex or hidden relationships. In the project, we intend to develop and test working prototypes in real-world situations. Examples include applications running on regular mobile phones, as well as displays situated in grocery stores selling ecological and non-ecological products or other public places. Such applications could be directly linked to e.g. specific grocery products to visualize information related to the value chain of the product, or to visualize the overarching global and local effects of similar products.

Keywords Everyday visualization · Sustainable Development · Sustainable Consumption

Everyday Visualization and Sustainable Computing

Everyday visualization is an initiative to explore visualization techniques suitable for mobile and non-professional context of use. Traditionally, information visualization has been limited to professional use, for instance to visualize complex relationships in economy, drug discovery, logistics, and so on [1]. With this project, we intend to put the power of visualization in the hands of non-professional users. By making visualization readily available in mobile devices and in public places, we can use advanced visualization techniques to inform and support consumers in their everyday decision-making. Everyday visualization is an emerging area, where for example a combination of maps, search tools and other services are becoming available on advanced web pages (referred to as “Web 2.0”) and on mobile devices such as Apple’s iPhone [8]. It represents a largely untapped opportunity for information and education and is a quickly growing business opportunity.

In this project we will focus on sustainable consumption, which represents an important opportunity to change the ongoing exploitation of our natural resources, and to counter the negative effects currently caused all over the world by non-sustainable consumption. We will investigate dynamic visualization tools that can make it easier for consumers to actively participate in reducing their ecological footprints through their consumption choices. It has recently been argued that sustainability can and should be a central focus of interaction design [2]. Previous research efforts in this direction include using design to inform about energy consumption in the home, for example a power strip that visualizes the amount of and electricity that flows through to the connected appliances [6] or a mobile game that raises awareness of domestic power consumption [3]. Other efforts have involved the use of social networks on the Internet to raise awareness of the ecological footprint and to encourage new habits [9]. A Dutch art project, MILK [10] used GPS (Global Positioning System) technology in combination with visualizations, photographs and interviews to create engaging narratives of the people involved in milk production, transportation and consumption – from the original production by Lithuanian farmers, to cheese making and transportation to consumers in the Netherlands. Further, a Swedish alliance between companies and local authorities and the government called Framtida Handel (Future Trade) has investigated ecological receipts, where positive environmental effects caused by ecological consumption are printed directly on the receipt when purchasing a product [4].

We will continue in this direction, and investigate a more dynamic and visually engaging approach to support sustainable consumption. We intend to look into the possibilities of creating a more direct emotionally engaging link e.g. to the people working at a Swedish ecological farm or to the people working at a fair trade coffee farm in Brazil. This focus could benefit from e.g. context-aware technology in combination with mobile phones, which already is investigated in projects with environmental focus, such as in the Urban Pollution Monitoring Project where carbon monoxide is measured with mobile devices and visualized with 3D [12] and in Ergo a SMS-based system where people can use their mobile phones to easily access, share and discuss air quality [5]. Previously, the researchers in the project have been working on Context photography, where sensor-data visually affects digital photographs as they are taken [7].
Sensor data (i.e. sound and movement) was visualized as graphic effects in photographs. We now intend to investigate sensor data relating to ecological products in combination photographs and other visual media (e.g. photos from ecological farms) to create playful and engaging interactive visualizations for mobile applications and wall-mounted visualizations.

We have previously been working with everyday visualization techniques i.e. Informative art [11]. These wall-mounted artful and useful visualizations supported mundane activities such as taking public transportation, by visualizing real-time data from sensors on buses. We now intend to explore similar techniques for wall-mounted or projected interactive visualizations, to compliment the applications running on the mobile phones. This may involve larger visualizations of e.g. the environmental impact of food processing that a specific product involves. The project has a number of potential industrial partners who can contribute with different types of expertise, such as visualization tools, certification of ecological products, consulting in environmental and social responsibility, grocery stores, and a news provider investigating global companies where conditions are reported as environmentally or socially unsatisfactory.

In the workshop I hope to contribute to a discussion about sustainable computing and its role in HCI and Ubicomp research. For example, this project is intended to investigate visualization techniques to support sustainable consumption. By looking into potential future Ubicomp services and applications addressing a sustainable development, we as researchers can point towards human needs and novel business opportunities that address ethical and environmental concerns. However, the choice of technology and its design will also have environmental effects, for example affected by how the active the use is (consuming more or less energy) and if it has been designed with a link between invention and disposal [2]. Thus, research about sustainable computing should also investigate how to avoid negative environmental effects when using software and hardware as a design material.

**Biography**

Sara Ljungblad conducts her research work at the Future Applications Lab. The lab is located at the Viktoria Institute in Göteborg, Sweden and is led by Dr. Lars Erik Homquist. Sara Ljungblad is a Ph.D. student in applied IT at Göteborg University, and holds a M.Sc. in Informatics and a B.Sc. in Cognitive Science. Her Doctoral thesis work focuses on innovative design and design methods, such as Transfer Scenarios, intended to support the design of innovative digital artifacts by using a marginal or alternative practice in the design process. Sara Ljungblad has been working with various technologies in her projects, such as agent- and robot technology, digital camera technology, visualization techniques and intelligent pushpin technology. She has presented her work at international conferences such as CHI, NordiCHI, Ubicomp, Info-Vis, RO-MAN, DUX, DIS and the PUC Journal.

**References**

2. Blevis, E. Sustainable interaction design: invention & disposal, renewal & reuse Proceedings of the SIGCHI conference on Human


5. Ergo (2007); http://www.urban-atmospheres.net/Experiments/Ergo/


10. MILK project (2005): http://milkproject.net/


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