

Weather by Mondrian: Designing Enjoyable Information Displays

Sara Ljungblad and Lars Erik Holmquist

Future Applications Lab

Viktoria institute

Box 620, 405 30 Göteborg, Sweden

www.viktoria.se/fal

{sara.ljungblad,leh}@viktoria.se

CONTRIBUTORS' BACKGROUND

Sara Ljungblad is a Master's student in the Future Applications Lab at the Viktoria Institute in Gothenburg, Sweden. This submission is based on work performed for her Bachelor's thesis. Dr. Lars Erik Holmquist is leader of the Future Applications Lab. Previously, he founded and led the PLAY research group (1998-2001). He has worked extensively in research on non-work-oriented novel computer applications. He arranged two successful one-day workshops called *The Future of Fun* (1998 and 1999) where participants developed innovative entertainment applications. For more information, see:

<http://www.viktoria.se/fal>

<http://www.playresearch.com/>

Holmquist, L.E. The PLAY Research Group: Entertainment and Innovation in Sweden. *Extended Abstracts of Computer-Human Interaction (CHI) 2000 (organization overview)*, ACM Press, 2000.

Davenport, G., Holmquist, L.E. and Thomas, M. Fun: A Condition of Creative Research. *IEEE Multimedia*, 5 (3), 1998.

INTRODUCTION

We are working with how to present information in a more enjoyable way. Current information displays are usually only designed for presenting information in the most efficient way. However, people tend to use many forms of decoration to make their environment more enjoyable and aesthetically pleasing. They fill their personal spaces with flowerpots, posters, paintings, curtains, and many other things. What if there was a way to combine the role of decorative objects with displaying information? As a playful combination of traditional wall decorations (such as posters and paintings) with dynamic computer displays we have previously developed *informative art* [1, 2]. A piece of informative art will be reminiscent of a certain painter in style, but instead of providing a static image its visual appearance is continuously updated to reflect some dynamically changing information. The resulting visualization is then shown on a wall-mounted display to give the impression of an ordinary painting. (See **Figure 1.**) Data that has been visualized in previous examples of informative art includes e-mail traffic, current weather



Figure 1. Informative art can be placed in public places like a corridor or a lunchroom to provide timely and relevant information

conditions around the world, earthquake data and the activity level in a room. Painters whose styles have been used as inspiration include Piet Mondrian, Bridget Riley, Andy Warhol and Mark Rothko. The long-term goal is that informative art will take a similar place in our daily environment as traditional artworks do today, while at the same time providing information that is relevant for the place it is situated in.

But how does one design and evaluate this kind of “enjoyable” technology? This kind of display is intended to be used over long periods of time – months or even years – and be integrated into everyday environments as much as possible. This makes traditional evaluations methods, such as lab studies, problematic. Furthermore, since art is something very subjective, different people may have very different opinions – what one person thinks is a beautiful image, another might find completely unappealing. While some might find our appropriation of well-known art playful, others might find it disrespectful and perhaps even offensive!

Some of the important questions that arise are: Is it possible to design works of informative art that are aesthetically pleasing yet provide updated and relevant information? How can we teach users how to “read” the information? Without any kind of introduction, how will users perceive informative art – will they understand that it has the intention to convey information, or will they just see it as

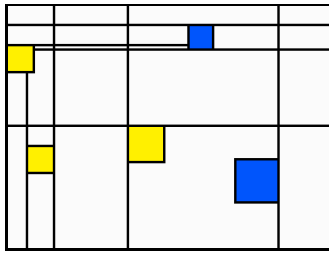


Figure 2. In this example of informative art, the local weather forecast is shown in a style inspired by Dutch painter Piet Mondrian

decoration? Here, we will describe a preliminary study where we wished to explore issues important for the future design and evaluation of informative art and similar enjoyable and aesthetically pleasing information displays.

PREPARATION

We wanted to capture an “everyday” experience of informative art in a semi-public area, and we were interested in getting general perceptions and opinions from as many people as possible. We did not have time to perform in-depth interviews; thus, questionnaires were deemed the most suitable method for data collection. We choose the Göteborg IT University as the setting for our study. It has about 150 students that are present every day except weekends. The IT University already had several large flat-panel displays situated in public spaces, which showed continuously updated text announcements. We used one of these to display a piece of informative art.

Pre-study

To provide ideas for the implementation, we distributed a questionnaire to 30 students. We asked them what types of information they might be interested in seeing displayed using an unspecified “abstract” visualization. Suggestions included timetables for public transport, news reports, course schedules, and the weather forecast.

Implementation

Weather forecasts were among the most common suggestions in the pre-study, and weather data could easily be obtained from the Web. Therefore we chose to design a weather display. In previous work, we had used inspiration from Dutch painter Piet Mondrian’s distinctive geometrical compositions in the primary colors red, blue and yellow to display the current weather in six different cities [2]. For this study, we decided to adapt the same style to visualize weather forecasts.

The visualization looks superficially like a Mondrian painting, but in fact each colored square on the display represents the weather of one day. (See **Figure 2.**) The display is read left-to-right, top-to-bottom. The first square (top-left) represents today’s weather, the next one tomorrow, and so on. This gives a four-day weather forecast in the following way: The size of each square reflects the temperature for that day. The colors show the weather condition: yellow represents a sunny day, blue

represents a rainy day, and red represents clouds. The information on the Web was updated daily, and the application reflected the updates dynamically. The resulting image thus reflects the current weather forecast, while still being reminiscent of a painting in the style of Mondrian.

THE STUDY

A short briefing on how to interpret the visualization was held for a group of about 30 students immediately after the informative art piece was first displayed. Two studies were then conducted. The first was performed two days after the implementation, and involved 19 students of which 9 had been to the briefing. Questionnaires were handed out to people that were passing by or staying in the area where the informative art piece was situated. The second study was conducted seven days after the informative art had been implemented. It was done in the same way as the first and involved 21 students, were 6 had been to the briefing.

Results

Participants who were present at the briefing:

The majority of these had a very positive attitude towards the installation, and no one indicated a clear dislike. Most also claimed that they understood the visualization. However, several did in fact confuse the meaning of the graphics. Out of 15, 4 had definitely understood the visualization, 7 gave answers that indicated that they may or may not have interpreted it correctly, and 4 did not understand it correctly. Some participants provided their own suggestions of ways to map the graphics to the information. For example, one participant wanted blue to indicate “blue skies”. One did not know in which order to “read” the squares, and 3 believed that a five-day forecast was shown while it was in fact it was the current day plus a four-day forecast.

Participants who were not present at the briefing:

These participants also had a generally positive attitude towards the piece and most found it aesthetically pleasing, but perceived it as “a piece of art” or as decoration only. 3 of them had been informed by another student that it was a weather forecast, but only 1 could read it correctly. Most seemed to believe that it was a static picture, even though they had seen the display for several days, and a few even explicitly criticized the image for being a still-image.

CONCLUSIONS AND FUTURE WORK

This was only a preliminary study, but the general attitude towards informative art was positive and most participants expressed that they enjoyed the installation – even when they did not understand it. Several of the participants who had been to the briefing could use it for its intended purpose as a weather forecast. However, since some also misinterpreted it, the briefing should have been complemented with some other source of information, e.g. a brochure, or a caption on the display.

To make informative art more enjoyable, we will need to explore many different combinations of information and artworks. For instance, it might be worthwhile to display

information that changes more rapidly than the weather forecast. Involving prospective users is also important. Future applications should be designed based on examination of users' preferences, determining both which types of information to display and what kinds of artworks to use as inspiration. Personalization is another important factor. In the future, we hope to provide users with the possibility to design and install their own personalized informative artwork, adapted according to their personal preferences.

For future evaluations we are interested in studying the long-term use of informative art. It will then be important to find environments that are suitable for this kind of

technology. For instance, public environments where people spend time, such as waiting rooms, gyms and cafés, might be made both more enjoyable and more interesting by the introduction of informative art.

REFERENCES

1. Redström, J., Skog, T., and Hallnäs, L., Informative Art: Using Amplified Artworks as Information Displays. *Proc. Designing Augmented Reality Environments (DARE) 2000*, ACM Press, 2000.
2. Skog, T., Holmquist, L.E., Redström, J. and Hallnäs, L. Informative Art. *SIGGRAPH 2001 Conference Abstracts and Applications* (Emerging Technologies exhibition), 2001.