# Don't Look

## Ubiquitous Computing Project

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## Abstract

In this project our aim was to raise questions about the implications of ubiquitous computing. The intention being to cause people to think about how emerging technologies might be used against the public interest. As part of the practical work, we created an installation showing how a situation familiar to many of us, watching television news, can easily be affected by hidden technologies. It was carried out during the Ubiquitous Computing course run by Chalmers University of Technology in Gothenburg, Sweden.

## Introduction

Ubiquitous Computing is a term coined by Mark Weiser in 1988 and later, in 1991, described in his paper The Computer for the 21st Century. According to Wesier, "The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it." Weiser sees this disappearance as the next step in computer technology and a positive step: "only when things disappear in this way are we freed to use them without thinking and so to focus beyond them on new goals." [1]

In this project we wanted people to think about some of the negative implications of this vision and to create an installation where a familiar situation is affected by hidden technology.

## Concept

The motivation behind the installation was the observation by some media analysts that news broadcasts give a very uncritical, power-friendly view of the world [2]. With advances in computing giving us so much processing power and newer and improved algorithms which enable not just face detection but also face recognition, we imagined a future where individuals were no longer anonymous viewers seeing and hearing standard state-corporate propaganda. They are now identified and monitored, whether at home or outside. The television programme, news, advertising, all 'personalised' based on viewing history, online profiles, etc. This type of tracking is not uncommon on the web and with ubiquitous computing it could easily be extended to other aspects of our lives. On the web, users can protect themselves using browser add-ons which identify and disable trackers. If tracking

and monitoring technologies become ubiquitous, how would we protect ourselves in the outside world against technology that has disappeared from view?



Figure 1: In the future, will we have wear masks to protect our identity?                    Photograph: Dara Mac Dónaill

For the installation we wanted a system which would reward the viewer if they looked away or covered their face to prevent identification.
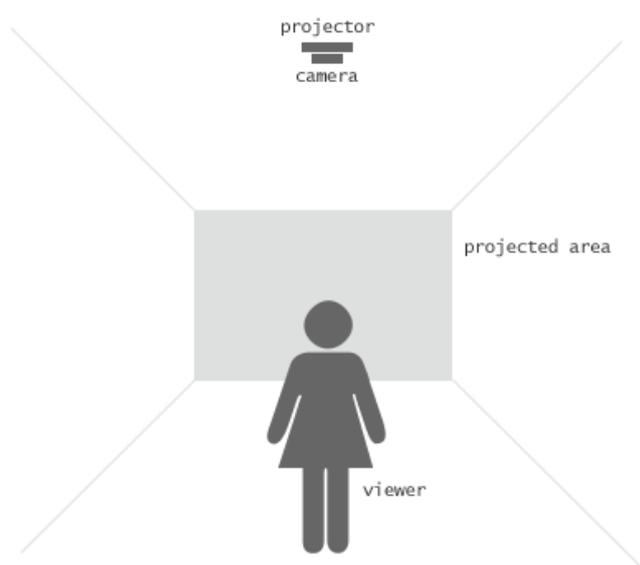


Figure 2: Initial sketch showing how we planned to implement the system

# Realisation

Our initial idea was to alter the news sequence in some way when viewers were identified and certain activities (e.g. a lot of movement) detected. We realised that this would turn out to be too difficult to implement in the time we had and we were unsure whether the subtle changes in the news sequence would even be noticed by viewers.

The final idea was to show two videos but only have one video audible. Which video the viewer would hear would depend on whether they were looking at the videos or looking away (or covering their eyes). We decided to choose video clips on the same topic. The topic ended up being September 11 mainly because we found many videos online related to the event. We chose a mainstream news broadcast (BBC News) and a more rational, reasonable view on the causes of the attacks (an interview with Noam Chomsky). Viewers looking at the videos hear the BBC News broadcast but as soon as they look away or cover their eyes, they hear the Noam Chomsky interview fade in and the BBC video fade out.



Figure 3: BBC video on the right, Chomsky interview in the middle, zoomed in view of BBC footage on the left

To implement the system we used:

- Logitech webcam (any webcam will work)
- Laptop computer (connected to the webcam)
- Two videos downloaded from the web and converted to the Flash Video format using MediaCoder [3]
- Processing as the programming language [4]
- OpenCV for face detection [5]
- Processing libraries: JMCVideo, OpenCV [6]

The source code is available on our website [7].

# Evaluation and discussion

From a technical standpoint, the installation worked very well and had no trouble detecting faces, playing videos and fading in and out the volume of the videos.

The biggest challenge was actually communicating the idea behind the project to viewers. We had deliberately chosen to make the interaction very subtle and unobtrusive – we didn't want to draw attention to the camera to keep with Weiser's idea of technology disappearing. To achieve that we decided not to show the frames captured by the webcam and only process them in the background, while the videos were playing.

The biggest problem for us was getting viewers to actually spend time with the system to figure out what was happening. With so many projects sharing the same space it proved very difficult to keep people's attention. The feedback we received from interested people suggested the presentation could have been improved to give people more time to find out what was going on. The most enthusiastic of the visitors were the art students from Valand. They explained that the clutter around the space detracted from the overall experience and confused them. They said a dark space with only the videos (projected) and audio would have worked much better and given people a better opportunity to listen and see how their actions affected the videos.

Another problem we faced was related to the broader aim of the project: how to get visitors to see that unless some of the advances in ubiquitous computing are understood and challenged, they could, and very likely will, end up being used against the public interest. These issues are not so easy to communicate through an installation, especially when shown among other projects which more or less embrace the idea of ubiquitous computing as a move in the right direction.

Some of the concerns we have outlined in this report were expressed by computer scientist Joseph Weizenbaum in his book Computer Power and Human Reason. Weizenbaum writes that there are two views towards computers, in one camp there are those who "believe computers can, should, and will do everything" and in the other there are people like himself who "believe there are limits to what computers ought to be put to do" [8]. The trouble is, the first camp comprises very many powerful voices that will do everything they can to sell that idea for purely selfish reasons, regardless of the consequences to people's lives.

In 'Everyware: The dawning age of ubiquitous computing', Adam Greenfield [9], Nokia's head of design explains why:

> The logic of success in late capitalism is, of course, continuous growth. The trouble is that the major entertainment conglomerates and consumerelectronics manufacturers have hit something of a wall these last few years; with a few exceptions (the iPod comes to mind), we're not buying as much of their product as we used to, let alone ever more of it…

> Putting with maximum bluntness an aspect of the ubiquitous computing scenario that is rarely attended to as closely as it ought to be: somebody has to make and sell all of the sensors and tags and chipsets and routers that together make up the everyware milieu, as well as the clothing, devices, and other artifacts incorporating them…

> So if businesses from Samsung to Intel to Philips to Sony have any say in the matter, they'll do whatever they can to facilitate the advent of truly ubiquitous computing, including funding think tanks, skunk works, academic journals, and conferences devoted to it, and otherwise heavily subsidizing basic research in the field. If anything, as far as the technology and consumer-electronics industries are concerned, always-on, real-time any- and everyware can't get here fast enough.

So ubiquitous computing is becoming a reality not because people have asked for it but because business is creating it, marketing it and selling it. And if business is the main driving force behind these developments, it's pretty clear that its main concern is not going to be the needs of ordinary people. The lawyer Joel Bakan [10] explains: "The corporation's legally defined mandate is to pursue, relentlessly and without exception, its own self-interest, regardless of the often harmful consequences it might cause to others." If this is the reality of the world we live in, it's time we viewed ubiquitous computing developments with a much more skeptical eye.

## Related Work

Ignoratio Elenchi: A News Feed [11] is an installation created in 2007 by Raphael Zollinger, a student at NYU's Interactive Telecommunications Program. Its aim is similar to ours: to highlight the vast amount of propaganda we're exposed to through the media and how difficult it is to reach meaningful information. It does this through four 6" LCD screens with

proximity sensors attached. Each screen shows "actual first hand video footage and accounts of events in Iraq" but changes to "commercial news reports of the same events" as soon as a presence is detected. We had read about his work online before starting out on our project and it was certainly an inspiration for our own work.



Figure 4: Raphael Zollinger's Ignoratio Elenchi

Its implementation differs from ours in that it uses four screen but simpler proximity sensors whereas we opted for one screen but used face detection. The different approach allows us to know whether a viewer is actually facing the screen or not.

## References

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2.  Edward Herman and Noam Chomsky describe their Propaganda Model in their 1988 book *Manufacturing Consent.* An overview available here: http://www.chomsky.info/onchomsky/2002----.htm

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5.  http://en.wikipedia.org/wiki/OpenCV

6.  JMCVideo: http://www.mat.ucsb.edu/~a.forbes/PROCESSING/jmcvideo/jmcvideo.html
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