

# Open Window: Reducing Isolation for Patients

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## ABSTRACT

We present Open Window: an ambient virtual window display for long-stay hospital patients that aims to reduce feelings of loneliness and disconnection from the outside world. This is an ongoing project in collaboration with the blood disease isolation unit of a local city hospital. We discuss the very particular constraints that were present for this project, the feelings engendered in patients by long hospital stays and isolation, how we believe these can be alleviated and the system that has been implemented.

## Keywords

Connectedness, isolation, hospitals, windows, ambient media, background awareness

## INTRODUCTION

St. James's hospital in Dublin, Ireland, houses the Denis Burkitt ward: a hematology and bone marrow transplant unit with 21 rooms, each of which is isolated from the others and the outside. After testing positive for one of the blood diseases treated here, the patient moves into one of these rooms and is kept isolated for up to six weeks. Coupled with the psychological stress of being diagnosed with a life-threatening illness, and the physiological toll of the aggressive treatment, is the experience for patients of being isolated from the people and places they know and love.

Like most hospitals, the environment is rather uninspiring, but for these patients this situation is made worse by their long isolation in relatively small rooms (Figure 1) necessitated by their weakened immune systems. While each room does have a window, none offer expansive or particularly interesting views, with the worst looking directly onto an air-conditioning plant. Our goal was to find some way of reducing the extent of the problems associated with long-term solitude and disconnection both from familiar people and places and the outside world in general.

## RELATED WORK

Two areas of psychological research are of particular relevance for this project. The first deals with the impact of windowed and windowless spaces in a healthcare setting. Ulrich [5] studied the effect on post-operative patients of staying in rooms viewing brick walls or nature scenes. Patients with the scenic view had shorter postoperative stays, received fewer negative evaluative comments in nurses' notes, and took fewer potent analgesics compared to

those viewing the brick wall. The second area of work is concerned with the correlation between social interaction and integration and various measures of health. Seeman [2] has noted the highly beneficial effect on social interaction on recovery from a heart attack. She also points out that "social isolation and non-supportive social interactions can result in lower immune function", while "socially supportive interactions have the opposite effects".



**Figure 1. One of the isolation rooms in the ward.**

There are several systems such as STARBRIGHT [3] that act as self-contained web sites supporting patients undergoing difficult treatments, however with their highly structured natures and focus on on-line communities they vary greatly from Open Window with its combination of live ambient connections and dynamic nature scenes. There are some products such as the large-scale backlit images produced by Therapeutic Environmental Solutions [4] or the Virtual Aquarium from America Art Resources [1] which display scenic images in an attempt to improve the hospital environment, but not in a way that is both dynamic and connected to the real world.

## DESIGN ISSUES

Before beginning the design process we spoke with ex-patients from this ward in an attempt to understand the situation a little better. The following are some representative quotes:

•“...I found I had no interest in watching T.V. and after a long period of time in isolation I just longed to see everyday things in the outside world”.

•“... nice to see kids if possible and family (while number of visitors were restricted)”.

•“The days are so long and you don’t see much of anyone or anything”.

•“I used to always keep the blinds down because I didn’t want to look out the window because there was nothing to look at”.

Given the serious nature of the illnesses being treated in this ward, with many patients having severely reduced immune systems, the overriding goal and constraint in this project had to be the duty to patient care. Technologically this meant that serious thought was given to choice and location of equipment. Through consultation with hospital architects during the building of a new wing to the unit we were able to incorporate the various cabling we needed without compromising patient isolation. This also allowed us to locate most of the hardware remotely, thereby making maintenance much easier in such a tightly controlled environment, and reducing the clutter in the patient rooms; something specifically requested by the medical staff.

Patients are often too ill during their stay to focus enough to read a book or watch the television in their room. The goal of this system then was not to entertain, but to enhance feelings of connection in an unobtrusive way.



Figure 2. Sample scenes from pre-recorded movies.

### SYSTEM DESCRIPTION

We arrived at the following design for Open Window: a virtual window projected onto a bare wall of the patient's room that displays low frame-rate images from a location the person finds strengthening, such as their home, as well as pre-recorded movies from areas of natural beauty with an ambient audio track. The only equipment present in the patient’s room is a low-noise video projector, a pair of hi-fidelity speakers mounted on the wall behind the bed, a wireless trackball that the individual uses to interact with the system, and a wall mounted junction-box that allows us to position the computers in a more easily accessed storage room.

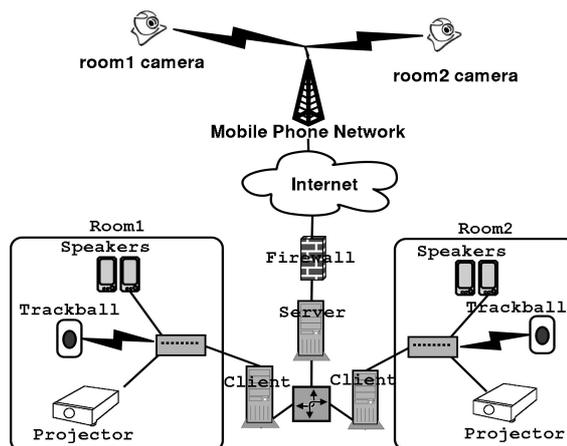


Figure 3. Schematic for set up of two patient rooms.

Images arrive via portable GPRS-based observation cameras that we give to the patient’s family. These cameras provide something closer to an image slide show than full frame-rate video, taking and sending an image every few minutes. A big advantage of these is that the families can simply plug them in anywhere with a power supply and cell coverage and they will work. Figure 2 shows some stills from the pre-recorded movies. All transitions in the display, whether between different content streams (channels) or between successive still images, are gradual with gentle fades so as to avoid any jarring transitions. Patients switch between channels through use of the buttons on the trackball. Individuals are also given the remote control for the projector giving them the option to switch it off completely if they want.

### FUTURE WORK

Our immediate goal now that the system is in use is a series of qualitative and quantitative studies to refine the system design and to obtain some information on its impact on both patients and their families during their stay. Further work will include expanding the content of the system now that it is in place.

### ACKNOWLEDGEMENTS

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### REFERENCES

- All URL’s last visited on August 6<sup>th</sup> 2004.
1. AAR <http://www.americanartresources.com>
  2. Seeman, T.E. Social ties and health: the benefits of social integration. *An. Epidemiology* 6, 5 (1996), 442-451.
  3. STARBRIGHT <http://www.starbright.org>
  4. THS <http://www.tessusainc.com>
  5. Ulrich, R.S. View through a window may influence recovery from surgery. *Science*, 224, 420-421