

# User Generated Ambient Presence

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## ABSTRACT

Presence is an important part of our day to day lives. Often we will have a sense of who is around us and what they are doing by the sounds of doors closing, cupboards banging, footsteps on floors, voices vaguely heard through walls, etc. In digital spaces, such as GUI desktops, presence enhances our sense of connection with geographical separate friends and colleagues. In this paper we report on Ambient Jewelry, which is a project exploring the intersection of individual and user generated customization with ambient presence displays. With this research we are seeking techniques that enable people to invent, discover and find new forms of ambient presence visualisations.

## Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces

## General Terms

Presence, Ubiquitousness, HCI, Instant Messaging, Communication Patterns, Digital Presence

## 1. INTRODUCTION

Ambient Jewelry is a work-in-progress project that explores the intersection of individual and user generated customization with ambient presence. The aim is to enable the creation of more personal and richer forms of ambient presence, with the aspiration that this will allow us to more deeply connect with our friends and family in a non-intrusive manner. Within this project we used small rounded windows that we call Jewels, to display the User activity. An example of this Jewels can be seen on Figure 1.

Awareness of presence is an important part of our day to day lives. Often we will have a sense of who is around us and what they are doing by the sounds of doors closing, cup-



Figure 1: Examples of three different Jewels.

boards banging, footsteps on floors, voices vaguely heard through walls, etc. In digital spaces, such as GUI desktops, presence enhances our sense of connection with geographical separate friends and colleagues. For example when you use an Instant Messaging (IM) client you see which friends are currently online or away, and when engaged in IM chat you are also told whether the people in the conversation are typing. On social network sites, such as Facebook, presence has a more explicit form. We are told what the people in our social network did, e.g. Mark joined the Ireland network, Germán and Mike are now friends.

As of yet presence representations, such as in Instant Messaging clients, rarely enable us to control how our presence is represented. We cannot decide to design colourful Jewels rather than virtual flowers (ambient presence avatars) that spin on our friend's desktops to show how fast we're typing. Nor can we create the relationships between arbitrarily designed presence avatars and how transforms of the avatars encode actions.

The representation of presence tends to be specified by the designers of the presence systems. A designer decides that colourful squares on a desktop cube are suitable for representing a remote friend's movement, while another designer designs a presence representation where an artificial flower opening means a friend is walking into a distant room, or flowing water represents variations in currency exchange rates [10].

Within the project we took an open design approach. That is we acknowledge that users may be better suited to inventing presence representations to suit their needs, social status and social connectedness. There are two different roles for users to design and personalise Ambient Jewelry presence:

1. The Creator of an Ambient Jewel: They design an Ambient Jewel to fit their likes, e.g. they create the initial graphical design of a Jewel from a family pho-

tograph (static content). Then they make the Jewel dynamic by setting up how the graphical look of the Jewel changes based on their actions, e.g. type fast and Jewel blinks fast.

Once a Creator has made a new Jewel they may share it with their friends. When a Jewel is shared with friends it is sent to the friend's remote desktop GUIs. When a Jewel is shown on a desktop it continues changing based on the Creators remote actions.

2. The User of Ambient Jewels: The User is the person who receives the Jewel and who sees it visually changing on their desktop.

The design process still continues with the User because the User is able to use their friends' Jewels to decorate their desktop. A User with more Jewels has more options to arrange them into aesthetically and artistically appealing patterns, shapes and clusters.

In this paper we outline our framework for and approach to enabling Users to become designers of their ambient presence displays. We are especially interested in understanding how the Users of a Jewel perceive the Jewel Creators actions.

By introducing sharing of the ambient displays we are indirectly forcing Users to reflect on their meanings. Will groups of friends converge and create the same style of Jewels, almost forming a shared ambient display graphical language that is specific to their group or community? Or will certain graphical representations and Jewel transforms emerge across all Users, because they make "sense" in an ambient display?

We are aware of the possible disturbing effects that could be created by people (especially by blinking and other distracting effects). The base effects are smooth and slow, but Users are allowed to alter and speed them up using modifiers. We consider interesting what the outcome of these broader limits may be. Will users tend to create disturbing effects? Or will they socially agree not to use them?

With this research we are seeking techniques that enable people to invent, discover and find new forms of ambient presence visualisations.

## 2. BACKGROUND

Presence and Ambient Displays have been explored in many innovative research projects [2, 11, 8]. For example Info-Canvas is an implementation of a user customizable ambient display where users can design the contents of the ambient display as part of information art[7]. Another similar display is Scope [9], which consists of small iconic representations based on notifications.

There are numerous different approaches to digital presence awareness. In Prior et al. tell us about an interface they created based on metaphors of the real world to help older adults understand the concept of Instant Messaging [6]. While Kranz et al. [4] created a novel physical device to share our on-line status.



**Figure 2: Examples of two different Jewels changing.**

BuddyBeads[3] is an example of research into creating physical Jewels that represent different emotions as non-verbal messages.

Another interesting example is Ambient Furniture that connects two geographically separated family tables, e.g. place a cup on one table and a vague outline of the cup appears on the other table [5].

Studies have shown how the design of Instant Messaging communication software affects interpersonal relationships [1]. From these studies we understand how technology can be redesigned to improve human communication and connectedness [11].

Based on the results of the preliminary discussions from [6] we understand that some participants got confused by the concept of an unrelated picture (avatar) representing them or their fellow participants. The same issue applies to Ambient Jewelry, since each user is able to create a unique Jewel with unique changes based on what they do and what they want to represent. We discuss this further in Section 4.

## 3. AMBIENT JEWELRY OVERVIEW

Ambient Jewelry consists of a cross-platform framework that easily lets people create and share their presence avatars. These avatars, which we have called Jewels, consist of small shaped windows of approximately 20-100 pixels. The Jewels allow the display of people's actions on their friends and colleagues' computers. So if a friend of mine has my Jewel, he will be able to know if I am connected, typing, or moving the mouse about. Furthermore, he will know I am doing such actions by watching what my Jewel does on his desktop. For example, I could design my Jewel to visually fade while changing color to red in order to display that I am really busy typing with my keyboard. There are many more actions that can follow the scheme:

ACTION -> EFFECT

Visually fading a Jewel is like this:

Typing -> Fade-Red

Other possible actions include:

Open-Windows->Sparkling  
 Mouse-Movement->Rotation  
 Listening-Music->Blinking

### 3.1 INTERFACE

The main Ambient Jewelry program consists of:

**Jewels** (Figure 2): Shaped display windows that represent other people's presence. They are placed on the desktop.

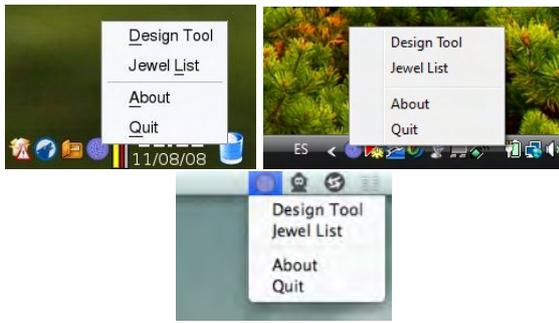


Figure 3: Cross-platform system tray application icon with menu (Linux, Windows and MacOS).

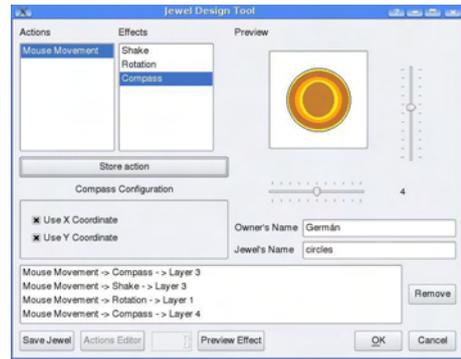


Figure 5: Design Tool window for creating Jewels.



Figure 4: Jewel Manager window for managing Jewels.

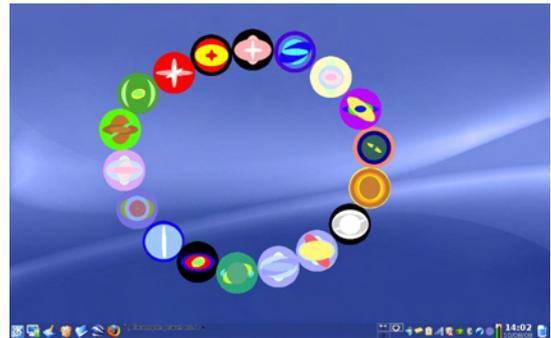


Figure 6: Example of several Ambient Jewels laid out on the center of a KDE desktop.

This is the part of the Ambient Jewelry software with which the User of Ambient Jewels interact with. Each Jewel has its own window.

**System Tray Icon** (Figure 3): This icon is the control point for all the other windows. Through it the User can access the different functions of the software via the popup item menu. Even if no Jewels are being displayed on the desktop the software runs in server mode gathering action data (e.g. mouse movement) and sending it to client Jewels. When the System Tray icon is used to quit remote Jewels stop getting updated.

**Jewel Manager** (Figure 4): Displays the list of Jewels available in the system. The Jewel Manager allows a User to carry out management tasks such as the installation of new Jewels, or adding Jewels to or removing Jewels from the desktop.

**Design Tool** (Figure 5): Allows the Creator to build, customize and modify their Jewels. In this window they can design a Jewel or assign the actions to the graphical transformations applied to a Jewel. In order to achieve this, the window consists of different options such as sliders to control the amount of time, color and different movements (transformations, rotations, shakes, etc.) applied to graphics that represent actions.

**Jewel Desktop Layout** (Figure 6): A major feature of Ambient Jewelry is that it enables Users with Jewels on their

desktops to create formations, patterns and designs with them. By doing this the User could create their own form of ambient display consisting of other people's customized Jewels (ambient displays). We are aware of the possible complexity this system could have when loading a considerable amount of Jewels. In order to enhance the learning curve of who owns each Jewel, we are debating displaying each owner's name and action performed in small tags when a Jewel is clicked.

The idea of aggregating customization of others customization opens another facet of user customization. We are planning on expanding Ambient Jewelry to allow the User to personalize his own actions with other people's Jewel based formations. This can be thought of as an Object Orientated style inheritance of ambient displays. Another option is to include some physical interaction algorithms so as to let the Jewels get sticky with each other, or allow them to move and interact with other Jewels. With these features we could provide a totally customizable interface from the User and the Creator's point of view.

**Example of use:**

1. Creator: Creates their Jewel by using the Design Tool with the effects:

Mouse-movement->Rotation  
 Number-of-Windows-Opened->Sparkling  
 Away-From-Computer->Fade

When finished designing the Jewel the Creator saves the creation to a \*.GEM file that stores all the data. The Creator sends the GEM file to one of their friends via email, instant messaging, or through the network communication layer between Ambient Jewelry clients.

2. User of Ambient Jewels: Receives the \*.GEM file and chooses to install it into their Ambient Jewelry software using the Jewel Manager window. When installed a new Jewel appears in the list of Jewels - with the static representation as an icon. Once installed the User activates the Jewel by clicking the "open" button. The Jewel appears on the desktop initially as a static image. After being displayed on the desktop the Jewel connects to the remote Ambient Jewelry server and starts to act following its script of actions (local \*.GEM file) when receiving the action data from the remote host.

#### 4. DISCUSSION

How will Users of the Jewels understand what changes in a Jewel mean? This raises an important aspect of our research - does Ambient Jewelry lead to discussions about Jewel meanings (encouraging back channel communication and socialization)? Also as was mentioned in the Introduction will a shared ambient display graphical language emerge? If so how much of that will be due to the expressiveness or limitations of the range of Jewels people can create with our software?

Users may need help in understanding what their friends Jewel transforms mean. In order to examine this learning curve issue we are considering having two control User groups. The first group would have small tags as part of the Jewels, which show keywords about the actions performed, while the second group would have no textual information about what Jewel changes mean.

When considering the business applications of Ambient Jewelry we realize that the core functionality may not be enough. In order to broaden the use of Jewels in professional applications we may need to take a different approach to the actions grabbed. Multiple actions may need to be mapped to a single graphical transform, for example displaying the rhythm of work in a shop by making the Jewel move faster when more people come into the shop and buy milk. If we use this approach, we would create a Jewel linked to a business, not a person, so the Jewel would display the status of the shop. A potential issue with this approach is granularity of the ambient display - too many actions and too much information about actions may be impossible to meaningfully display in the small display space of a Jewel. This leads to the question: How can we measure or quantify the graphical expressiveness of an ambient display?

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