Proximeter: An ambient social navigation instrument

John Kestner
MIT Media Laboratory
20 Ames Street
Cambridge, MA 02139 USA
jkestner@media.mit.edu

ABSTRACT
The proximeter is an agent that tracks the past and future proximity of one's social group, and an instrument that charts this in an ambient display. The intent of this concept is to nuture a social awareness and to nudge users toward more face-to-face interactions when opportunities arise.

Author Keywords
Ambient display, social awareness, tangible user interface, physical material constraints

INTRODUCTION
Social networking services such as Twitter and the Facebook mini-feed provide a constant, low-resolution stream of what friends are doing. While this would seem to induce information overload, these services have developed in users a social proprioception [3], a sense – not a thought – of the general state of our tribe that we have struggled to retain in globalization.

And while computers have the communication capabilities to produce such a sense, their complexity is why Buxton calls for a divergence toward a multitude of simpler tools, and looks to the design arts field for leadership. [1] David Rose describes a vision that meets this call [5], in which "beautiful antiques" resembling the barometer that his father taps every morning are scattered around the house, each providing specific data in a simple, elegant object.

The proximeter attempts to be one of these instruments, giving the user a sense of the movement of his or her social cloud. It does this by reflecting proximity between people. Proximity can be used to describe relative distance in space, or the amount of time it might take one to cover that distance. I can describe the proximity between myself and my mother as 2900 miles, but a more relevant description might be that we are 6 hours apart, or even a plane flight apart. The proximeter displays this information from the recent past, and projects to the near future. It does this by reading existing calendar and social network feeds of others and abstracting these into a glanceable pattern of paths.

Figure 1. A 14th-century astrolabe, used to measure time or distances. The Whipple Museum, University of Cambridge.

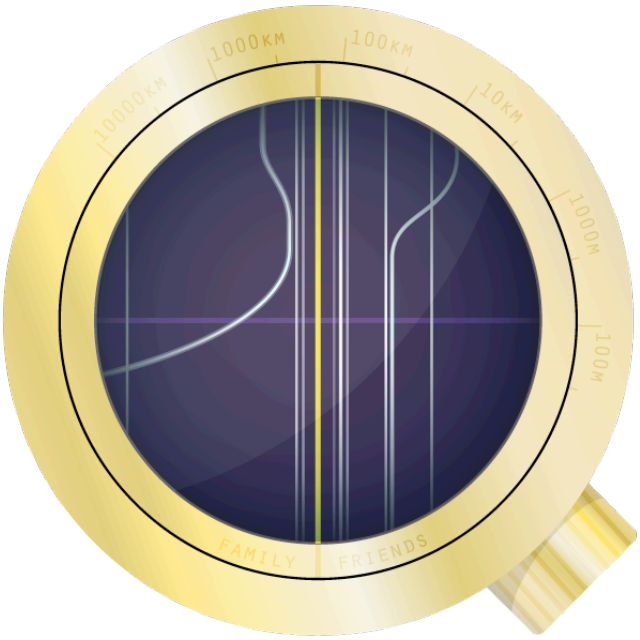

Figure 2. An illustration of a proximeter.

DEVICE DESCRIPTION

Astronomy, driven by the needs of explorers, has left us instruments that were so beautifully crafted that they remain in our cultural consciousness long after they have been obsoleted. These measured, calculated and modeled a universe of which we were the center. For instance, the astrolabe [Fig.1] was typically brass and circular with the Earth at the center; it was useful for measuring time, heights of celestial bodies and buildings, from the latitude for which the instrument was designed.

The physical form of the proximeter [Fig.2] is inspired by such a navigation instrument. The main display consists of 1) a convex circular glass face with a vertical rule inscribed representing the user, the Self-line; 2) below the glass, a series of filaments which represent individuals in the user's life, the Friend-lines. The friend-lines run vertically as they trace the proximity of a person to the user in the x-axis as time progresses in the y-axis. Practically, these are grouped by convenience of access, such as those people that are a walk away, or a drive away, or a flight away. Because the proximeter is largely an ambient display, this is a reasonable amount of information with which to make a decision. Recent proximity updates brighten the filaments of the associated person, while static data feeds fade.

The friend-lines are related to sparklines [2], which compress the movement of a data point into a less-detailed graphical representation. The center of the display is the intersection of the vertical Self-line and a horizontal line representing the present time (the Now). In this paper, the y-axis represents time and will be called the Here, while the x-axis represents distance and will be called the Now.

A ring around the face rotates to increase or decrease the time/distance scale. At a small scale, the scope of the information displayed by filaments is one day along the Here, and 10 minutes' distance (roughly just beyond the boundaries of a building) along the Now. At a large scale, the scope may be a month and 10,000 kilometers. A knob on the side can be twiddled to select a filament; the display will dim all filaments except for one, and display the associated person's name. [Fig.3]

The instrument's functionality stops here. It does not attempt to enable communication between the user and the selected person. This is intended to avoid becoming an agent that exposes every bit of information about a person. ThIs information may be willingly published, but without a personal exchange, it can feel intrusive. The variable scale and abstraction of data displayed by the proximeter provide a manageable level of privacy and user discretion.

Operation requires an initial assignment of friends to track, done either through a web browser or by sending contact information in standard vCard format [6] from a cell phone via Bluetooth. Individuals can be assigned to either the left or right side to allow for grouping, for example as friends and family. It then can retrieve data via a local connection to the Internet.

Figure 3. A filament selected.

NOTABLE FEATURES

Of note, the convex glass face is thicker toward the rim, distorting the filaments as they get further away from the Here and Now, which reflects the fuzziness of remote time/place data. As filaments approach the center of the face, they become more distinct and easier to read accurately. Like the PICO tabletop interface [4], this takes advantage of understood physical properties of a material to constrain the data being displayed, although in this case, it is the object imposing the constraint upon the user.

The proximeter can be read at several levels of attention. At a glance the user can see whether the rhythms of friends remain steady by the filaments running parallel. An intended change in location will register as a deviation which becomes more noticeable as that event approaches the Now.

While this paper describes a stationary device, the proximeter could be a portable watch-like device as well. In this context it would have a smaller time and distance range, and perhaps use more geolocation data, as a higher resolution of information would be more relevant in daily in-the-moment decisions.

SCENARIO

As Gabe enjoys his morning espresso, he glances at the proximeter hanging in the foyer. As usual, most of its filaments are all roughly parallel to the self-line. These may show small ripples where people go to work or return home. Some filaments are bunched near the center, representing local friends in Seattle. A few are further out, representing people in less accessible locations – other metropolitan areas or states.

Gabe usually keeps his proximeter focused at 12 hours, a very wide angle, so he sees filaments representing friends and family across North America as well as Japan. He can see one filament on the edge that he knows represents Kayo, since she's the only friend that far away.

Gabe then notices that one bright filament swoops in from the edge just above Now (crossing even Kayo's line) runs parallel very close to the self-line for a while and then dips back out a bit and settles into a parallel line slightly further away. From this he can surmise that a friend is soon flying into Seattle from beyond Japan, then soon after flying out again to somewhere else in the States.

Seeing an opportunity to reconnect with someone, he walks up to the proximeter and turns the filament tuner until the line of interest is highlighted. Jordan's name comes up, and Gabe can choose to send an email to make plans to meet up while he's in town.

RELATED WORK

Dopplr and TripIt are travel log services for the Facebook and LinkedIn social networks, respectively. Dodgeball and its successor, Foursquare, are mobile applications that allow users to provide others with their current location. As an embodied ambient display, the proximeter can use these services as data sources, but it is designed to provide a different quality of experience.

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