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The Familiar Stranger: Anxiety, Comfort, and Play in Public Places

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ABSTRACT

As humans we live and interact across a wildly diverse set of physical spaces. We each formulate our own personal meaning of place using a myriad of observable cues such as public-private, large-small, daytime-nighttime, loud-quiet, and crowded-empty. Unsurprisingly, it is the people with which we share such spaces that dominate our perception of place. Sometimes these people are friends, family and colleagues. More often, and particularly in public urban spaces we inhabit, the individuals who affect us are ones that we repeatedly observe and yet do not directly interact with – our *Familiar Strangers*. This paper explores our often ignored yet real relationships with Familiar Strangers. We describe several experiments and studies that lead to a design for a personal, body-worn, wireless device that extends the Familiar Stranger relationship while respecting the delicate, yet important, constraints of our feelings and relationships with strangers in public places.

Author Keywords

Strangers, urban space, wireless, wearable, ambient, public place, digital scent, community awareness, ambiguity, *dérive*, *détournement*

ACM Classification Keywords

H.5.3 Group and Organization Interfaces

INTRODUCTION

The Familiar Stranger is a social phenomenon first addressed by the psychologist Stanley Milgram in his 1972 essay on the subject [1]. Familiar Strangers are individuals that we regularly observe but do not interact with (see Figure 1). By definition a Familiar Stranger (1) must be observed, (2) repeatedly, and (3) without any interaction. The claim is that the relationship we have with these Familiar Strangers is indeed a *real* relationship in which both parties agree to mutually ignore each other, without



Figure 1: Familiar Strangers in a typical urban setting

any implications of hostility. A good example is a person that one sees on the subway every morning. If that person fails to appear, we notice.

There are exceptions to the non-interaction rule with Familiar Strangers. The further away from our routine encounter with a Familiar Stranger, the more likely we are to establish direct contact because of a shared knowledge and place. Thus, we are likely to treat our subway Familiar Strangers in San Francisco as close friends if we encounter them in Rome. Similarly, extraordinary events such as an injury, earthquake, *etc.* will also provide the impetus to interact with our Familiar Strangers.

There is a special class of Familiar Strangers called the “socio-metric stars.” These are individuals who stand out in a community or group and are readily recognized by an extremely high percentage of people.

Familiar Strangers form a border zone between people we know and the completely unknown strangers we encounter once and never see again. While we are bound to the people we know by a circle of social reciprocity, no such bond exists between us and complete strangers. Familiar Strangers buffer the middle ground between these two relationships. Because we encounter them regularly in familiar settings, they establish our connection to individual places.

It is also not uncommon for people to personalize their Familiar Strangers by giving them names and/or concocting fictitious stories and backgrounds of their personal lives [2]. The epiphany of the Familiar Stranger relationship is when an individual realizes that they are likely someone else’s Familiar Stranger, complete with names and stories.

MOTIVATION

Wireless, personal, digital technologies are rapidly transforming our relationship to people and place in public urban settings. Emerging mobile communication systems are fundamentally reshaping the spatial and temporal constraints of all aspects of human communications in both work and play. A myriad of new interactions and potential interactions between individuals are dramatically increasing the capacity and efficiency of information flow within urban settings. Mobile phones are simply the first wave of an imminent invasion of portable, personal digital communication tools. These future devices will undoubtedly lead to a transformation of individuals' perceptions of self and the world and consequently the way they collectively construct that world. Mobile communication devices will have a profound effect on our cities as they are woven into the daily routines of urban inhabitants.

While today's mobile communication tools readily connect us to friends and known acquaintances, we lack mobile devices to explore and play with our subtle, yet important, connections to strangers and the unknown – especially the Familiar Strangers whom we regularly see. Will these systems provide a new lens to visualize and navigate our urban spaces? How will these systems provide an interface to strangers and unknown urban settings? What will such devices look like? How will we interact with them? What will they reveal about ourselves and strangers? Will they alter our perception of place? Of the strange and unknown?

As computer and social scientists we have the responsibility to look critically at such underlying forces and trends. In this paper we take the urbanist's perspective on the application of these new technologies within cities by their inhabitants. We think of the city not simply in spatial terms, but temporally. We are interested in the movement and activities of people as well as the familiar patterns that comfort individuals within a seemingly chaotic, crowded landscape of *urban strangers*.¹

Urban Life and Public Places

The spectacular image of the modern urban city is that of a facilitator of commercial exchange, a place where people go to shop: the city as mall. The city is also a workplace – a center for government and business functions. While work, commerce, and business are the focus of cities, it is also a place for individuals and communities – a place where people can play. People come there to eat, drink, dance, meet friends, and just hang out. The potential for sociable exchange and the pursuit of happiness is vast. For its workers, the city also provides leisure zones – what Foucault calls “sites of temporary relaxation” [3].

However, the nature and locations of these social encounters are not always predictable. Whyte's “Street Life Project” [4] observed that usage of New York's downtown plazas varied wildly and bore little relation to extant theories of constructed space. Similarly, Lynch and Milgram exposed the difference between peoples mental maps of the city and the physical city plan [1, 5]. Jacobs talks about the creation of small neighborhoods in large cities [6].

Unfortunately, public urban spaces also manifest a degree of anxiety and fear. The 1964 murder of Kitty Genovese exposed the tenuous and conditional links urban dwellers have to their neighbors and community of Familiar Strangers. Genovese was murdered on the streets of New York City while her neighbors listened to her die. Not one called the police or came to her aid [7]. Afraid for their own safety, they were psychologically handicapped and emotionally bankrupt, unable to even telephone the police for help.

While massive physical changes are still rare in urban settings, a new social landscape is emerging. The extensive use of personal, wireless communication technologies enables behavior in urban spaces to transgress the lines and protocols between public and private space. Boundaries between home, office, automobile, and street are increasingly blurred [8]. Jain exposed how individuals used mobile phones within a city to influence the nature, negotiation, and navigation of urban space [9].

Recent research focuses on the use of new personal wireless devices, such as mobile phones, that allow us to communicate with those that we know at a distance. However, we are interested in exploring the implication of personal wireless devices that provide a loose connection (but not explicit communication) to those nearby whom we do *not* know – our Familiar Strangers.

At the same time, current trends in mobile phone usage increasingly divide people from co-located strangers within their community. Uncomfortable in strange situations or public places, people reach for their mobile phones, dramatically decreasing the chance of interacting with individuals outside of their social groups. We hope that our exploration of the Familiar Stranger will promote discussion around tools that work to improve community solidarity and sense of belonging in urban spaces. Encouragingly, newly emerging mobile phone uses draw us into acceptable social contact with strangers. Flash and Smart Mobs repurpose our existing personal wireless mobile technology to create impromptu social gathering between strangers [10].

Strangers

While we initially think of strangers as “removed and disconnected from us”, Simmel reminds us that “strangeness means that he, who also is far, is actually near” [11]. Although both qualities of nearness and farness

¹ To focus our task we are interested in exploring only the social phenomenon of the Familiar Stranger within urban settings. The concept of the Familiar Stranger is radically different in rural or suburban settings.

are found to some extent in all relationships, a special proportion and reciprocal tension between these two factors produce the specific form of the urban relationship to the stranger. In fact, for Bauman, society can only define itself against its strangers [12].

In public urban settings we navigate using familiar landmarks such as signs, trees, fences, *etc.* Milgram's initial interest in the Familiar Stranger was in understanding how the changing urban landscape of the 1960's was resulting in a mental remapping of navigational cues and landmarks from objects to people. He was interested in how people are used as markers of place and how they influence other people's sense of belonging in a place as a result.

We also find artists exploring issues of strangers and public places. Artist Sophie Calle returned to her native Paris and intentionally followed people around the streets in order to rediscover her city. She soon learned how much she could ascertain about the lives and habits of her own unknown subjects. Calle became obsessed with the people she was following, especially the physical details of their existence. Eventually this obsession brought her to Venice, where she tracked down and secretly photographed a man she had previously followed in Paris. She then published a collection of photographs and writings in her book: *Suite Ventienne, Please Follow Me* [13].

In contrast to Calle's covert urban performances, Guy Debord and the Situationists sought to reinvent everyday life in urban spaces by constructing situations which disrupt the ordinary and normal in order to jolt people out of their customary ways of thinking and acting. Using *dérive* (the urban flow of acts and encounters) and *détournement* (rerouting of events and images), the Situationist developed a number of experimental techniques that stressed the relationship between events, the environment, and its participants – urban strangers [14].

The Role of Culture and Strangers

The perception, role, and existence of Familiar Strangers are deeply embedded within the culture of communities (see Figure 2). In communities of less than 150 people – under the threshold Goffman calls “the nod line” – members are obligated to exchange polite greetings when they meet [15]. In cities, the opposite holds true. Urbanites are expected to maintain “civil inattention” in public places such as the subway platform or the elevator [16]. Both Milgram and Goffman attribute the phenomenon to the sense of urban overload caused by the sheer density of daily social interactions. Familiar Strangers make the city feel smaller while avoiding the impossible task of making small talk with everyone we habitually see.

Mobility is a key factor in the existence of strangers. For Simmel, the observer and the stranger were two poles in a binary opposition between mobility and stability. The stranger, by definition from *elsewhere*, represents mobility.



Figure 2: Overview of social network calcifications (left), and cultural differences of Familiar Strangers in cities (center) compared to small towns and villages (right)

The observer represents a fixed point by which mobility is measured. In an increasingly mobile and densely populated world, we feel ourselves to be strangers more frequently, and feel other people to be strangers to us. In the Kitty Genovese case, Milgram points out that Genovese died not because she had been alone in the world, but because she had moved far away from the friends and family who felt responsible for her safety.

Strangers also take on different meanings throughout individuals' lives. Adults warn children against strangers – even familiar ones – while themselves feeling safe in striking up casual conversations with people they do not know on buses.

GOALS

The research goal is to identify the properties and phenomenon of the Familiar Stranger relationships we currently observe in public places. We believe that extensions to this relationship using small personal wireless object can allow individuals to more acutely gauge their social relationship to people, places, and crowds around them over time. We also believe that such a device is capable of encouraging community solidarity, even transitory solidarity, in places where it is currently difficult to build such ties. Overall, such a system has a great potential to allow individuals to gain an improved sense of belonging within and across their communities, cultivating new views of comfort, safety, and inclusion. To break down these boundaries, the technology must allow individuals to retain an active sense of participation and inclusion across the public social landscape. As a result, we hope that such a tool may expand and improve our own impressions and beliefs of the strangers with which we share our daily lives. However, we are ultimately designing for ambiguity [17], leaving to the users to modify, re-appropriate, play, and adapt the system across a myriad of unintended uses.

CONSTRAINTS

While there are hints of McLuhan's global village meme within our approach [18], we are more acutely aware of Mitchell's concern for the preservation of the public sphere, entreating that technological enhancements to the urban landscape should improve everyday life while respecting humanity [19].

To that end it is necessary to declare that we are *not* interested in designing a friend finder, matchmaking device, or system that explicitly attempts to convert our strangers into our friends. Strangers are strangers exactly because they are *not* our friends, and any such system should respect that boundary. Having strangers on our urban landscape is *not* a negative thing. On the contrary, the very essence of individual and community health of urban spaces intrinsically depends on the existence of strangers. Their complete removal would almost certainly be detrimental.

RELATED WORK

We have been influenced by a number of projects that emphasize the importance of familiar people and places in systems that allow mutual strangers to annotate shared locations. Whether the result is displayed on large screens [20] or PDAs [21], they allow strangers to collaboratively create and access location-based content. Since interaction with the system can be asynchronous, it does not facilitate face-to-face interaction between strangers. Also interesting is the ease and spontaneity advocated by the LoveBomb, a conceptual project that encourages synchronous interaction between strangers in groups [22]. Physical proximity of users serves as a preliminary step to further acquaintance by allowing users to anonymously express private emotions in public places.

STUDY #1: MILGRAM REVISITED

Our initial experiment's primarily goals were to:

- Establish a baseline for the current state of our relationship with Familiar Strangers in urban spaces
- Expose changes to the Familiar Stranger relationship based on the 30 year old initial study
- Discover how familiarity affects perception of place and thus participation in a typical urban public space

Anecdotally, it was obvious that the Familiar Stranger relationship still existed. However, it was unclear to what degree the phenomenon was operating in typical public urban settings, especially in light of the widespread adoption of wireless mobile phones and other electronic devices that did not exist during the initial 1972 study. We updated Milgram's experiment to see whether his observations were still applicable.

Procedure

In the original experiment, Milgram's students at The City University of New York photographed people waiting on the platform of a suburban light rail station during the morning rush hour. A week later, Milgram's students returned at the same time of day and distributed duplicates of the photographs (see Figure 3). The people waiting on the platform were asked to label individuals in the photograph that they recognized or regularly spoke to.



Figure 3: Stanley Milgram's 1972 Familiar Stranger study

We focused our research on a similar urban space in downtown Berkeley, California named Constitution Plaza. This public plaza is an exemplar of the type of small urban space that Urbanist such as Whyte described as central to the health of public life in large cities [4].

Constitution Plaza is a high-traffic, block-long rectangle in the center of Berkeley's downtown. Anchored at one end by an imposing entrance to Berkeley's primary underground train station (BART²), and at the other by a central bus transfer point, the plaza sees a continual flow of pedestrians. While many cross the plaza without stopping, others pause to make phone calls, eat, or rest on the benches. Observations suggested two potential Familiar Stranger populations: (1) the office workers and students who eat lunch on the benches and (2) the commuters who wait for one of the 15 bus lines. The bus riders are a contemporary equivalent of Milgram's commuters; as a basis for comparison, we included the lunchtime group.

Following Milgram's study, we photographed clusters of people in each area during their respective busiest hours: noon in the seating area and 5:00pm at the bus stop. We returned a week later at the same times of day to distribute the set of four pages of photographs (see Figure 4). In order to test for Familiar Strangers common to the two groups, we distributed the same photographs to everyone. Like Milgram, we asked participants to label those in the photographs they recognized and those they regularly spoke to. We also asked them to note any information they had about the people they recognized. Along with the photographs, we distributed a questionnaire on relationships to the plaza and attitudes toward public place in general – especially those most familiar places, like their home neighborhoods. Participants were recruited by approaching everyone within the target place and time to get a somewhat representative sampling of the population. As with Milgram's study, the participants completed the surveys without our assistance and returned them by mail using an included self-addressed stamped envelope. Participants were asked to complete as little or as much of the questionnaire as they desired. We encouraged participation and disclosure of contact information by offering a chance to win a \$100 USD gift certificate to a local bookstore.

² BART is the Bay Area Rapid Transit system, a below and above ground light-rail system covering the San Francisco Bay Area.



Figure 4: One of several questionnaires used in the Berkeley version of the Familiar Stranger study

Results

Within the sample size ($n=23$)³ of our survey, it seemed clear that the Familiar Stranger relationship is common. While we found less familiarity than Milgram, the numbers are still significant. Eighty-nine percent of those Milgram surveyed recognized at least one person. Our study found lower (77.8%) but still high recognition. In contrast to Milgram’s average of 4.0 people recognized, our survey found an average 3.1 people recognized (out of 63 pictured), with a median of 2. The numbers are particularly high given that participants were recruited by approaching everyone within the target areas at the appropriate times. This inevitably included a higher percentage of non-residents and the cognitively impaired than the Milgram study did.

Clearly, the Familiar Stranger relationship is tied to the daily routines of urban life. When we spend more time in public spaces with others, we are more likely to recognize them (even if we have never talked to them). Lunchtime participants recognized on average far more (3.9) people than their counterparts at the bus stop (2.3). The demographics of the two groups did not differ noticeably, but the lunchtime group spent a median 15 minutes on site, while the rush hour group spent a median 5 minutes.

Within each social group, there was no definite correlation between the amount of time individuals spent in any one place and the number of Familiar Strangers they reported. Routinely spending time with strangers improves facial recognition on average, but some people are more adept at noticing and remembering the people around them.

Some people are also more recognizable than others: Milgram’s *socio-metric stars*. Thirty-three of the 63 people in the photographs (52.4%) were recognized by at least one person. But a few people were recognized more consistently: a man in a wheelchair, a flower vendor with a lavish display, and a long-haired homeless man. Milgram’s socio-metric star also had a consistent, unusual attribute –

she wore a mini-skirt even in winter. The socio-metric stars identified through the Berkeley survey suggest another factor – *prevalence*. Many seemingly forgettable people were recognized because they were seen often in one place⁴ or occasionally in many places⁵.

There was no correlation between the number of familiar strangers and positive attitudes toward the plaza, however. Even high levels of familiarity (6-12 people recognized) did not necessarily result in positive descriptions of the plaza. One woman, who recognized 6 people, described it as “unpleasant – dirty – aggressive people.” What did correlate to positivity, however, were the respondent’s reasons for visiting the plaza. People using the plaza solely to catch a bus were more likely to describe it in negative or neutral terms, while people who chose eat lunch there typically described it more positively. Since bus riders had no choice but to use the bus stop, their negative opinions of it did not radically change their behaviors.

STUDY #2: URBAN WALKING TOUR

Observations from the *Milgram Revisited* study suggested a relationship between recognition of strangers and experience of place. To situate our investigation of a mobile application within the real context of potential users, we interviewed nine Bay Area residents on a walk through Berkeley’s business district to address four issues:

- Evaluate ideas about familiarity and place derived from the observations of the plaza
- Clarify importance of social familiarity to perceptions of place
- Elicit input from users into design process
- Validate initial design decisions

Procedure

Over the course of a week, we arranged nine 45-minute “walking tours”. Each tour involved one interviewer and one subject on walking interview to four nearby, yet functionally distinct, public outdoor locations. Participants were encouraged to interrupt the tour at any time to nominate their own significant places. Starting at the plaza, the interviewer walked with participants to each location:

- Constitution Plaza – described in previous study
- Main Berkeley post office – a government building with narrowly-defined functions and limited hours
- Civic Center Park – a small park with a lawn and paved fountain area, frequented by soccer players, sunbathers, and the homeless who sleep there
- An inexpensive restaurant patronized by locals

³ There was actually a high participation rate. We handed out 80 photo/questionnaires and 23 were returned, nearly 30% participation.

⁴ “I always see him here.” (comment from Berkeley study)

⁵ “I’ve seen this guy on Shattuck [Street], Telegraph [Avenue], and on campus.”

In order to determine whether the social aspects of each location significantly affected participants, the interviewer asked them at each stop to rate their perceived sense of comfort on a scale of 1–5, identify any familiar people, then rank the following reasons for their reported sense of comfort in order of importance⁶:

- People around you
- Physical characteristics of place (architecture and amenities)
- Current environmental attributes (weather and time)

Using results from our initial observations and first survey, we had arrived at four quantifiable factors that we believed affected social comfort in urban public places:

- **Amount:** How many familiar people are around?
- **History:** How familiar are these people?
- **Turf:** Have familiar people visited this place in the past? Is this “my kind of place?”
- **Tribe**⁷: Do the people currently here visit the same places I do? Are they “my kind of people?”

The first three occur without any technological intervention. As shown in the first survey, Berkeley citizens routinely recognize strangers and act on the basis of their past behavior. Moreover, they routinely use physical evidence (such as graffiti) and their memories to determine whether familiar people have visited a specific location in the past. The fourth factor is not part of the current Familiar Stranger relationship because one must verbally query every nearby person to discover the answer. However, it can be captured by the proposed Familiar Stranger device and hence was included in the study.

To evaluate the relevance of these factors to participants’ perceptions of urban public places, we asked them to rate, *at that very moment in each place*, the importance to their own social comfort of each of the first three factors: Amount, History, and Turf. We encouraged participants to express place- and time-specific reactions – to explain, for example, why the park differs from evening to afternoon.

In order to introduce the fourth factor and reassess the importance of the first three factors in the wake of a technological intervention, we created a *Wizard of Oz* scenario with a hypothetical mobile device that monitored each of the four factors. Without prototypes or props, we asked participants to rate the importance of those four factors to them *if they had the actual device at that moment in each place*. Users who are asked to “act-out in context” and imagine using a future application under real world

conditions produce suggestions that are more quickly incorporated before expensive hardware is built.

After the tour, the interviewer initiated a participatory design exercise. Participatory design brings users into the design process and incorporates their input early, before final testing and has been found especially useful in testing mobile application concepts. Participants were asked to sketch their own representations of the data from the walking tour and complete two structured templates. The sketches then fueled a discussion of privacy issues surrounding the idea of such a wearable device. Would the user want it to be visible? Why or why not?

Results

Comfort levels varied from place to place, with women exhibiting more variation than men. On average, participants were most comfortable at the post office and least comfortable in the park, with women significantly less comfortable there than men. “The people around me” was consistently ranked highest of three factors (people, physical characteristics, and environmental conditions) contributing to a perception of comfort, most notably in the park, where people felt most uncomfortable.

Those interviewed valued information about familiar people most when they felt unsafe and when they had a choice of options. In the *Wizard of Oz* section, they rated information delivered by the imaginary device most important at the park and restaurant, and least at the post office. As one man said, “A park is someplace you’d want to hang out in – unlike the post office.” At the park, anxiety about street people created the need for social data. People most valued the number of familiar people nearby, as they wanted assurances of reliability for those around them. As one man said, “I don’t feel comfortable seeing people with all their worldly possessions with them...Knowing people who came here would increase my comfort level.” Another participant thought knowing “moms and kids” visited the park would be reassuring. One Participant wanted to differentiate the restaurant from the other “cheap joints” stating, “If lots of people I knew ate here, I’d have more respect for it. It would be interesting to see where other familiar people eat.”

New design ideas emerged from the participatory design exercise. By fusing participatory design with acting-out in context, participants drew from their experiences on the tour to create interfaces that responded to their expressed needs and concerns. After walking through a street fair, one woman included a request for a “discreet” interface and a “festival” interface. Since many users organized their sketches around social groups, we added user-defined groups (*i.e.* “students,” “moms and kids,”) to the concept.

The exercise revealed tensions in users between a desire for social data and concerns about privacy in public places. The “radar” metaphor – a representation of the social and physical space that maps others’ positions in relation to the user – was a favored invention of the participants,

⁶ Participants were also asked to name any additional factors they believed were important. Over 36 individual stops, this only occurred twice.

⁷ Turf is the degree to which the *now* place has common *past* people while Tribe is the degree to which the *now* people *have* common past places

occurring six times over nine interviews. However, privacy concerns rendered it unusable. Users liked combining spatial and social data to create a “social landscape,” but did not want other people to have that kind of information about them. Concerns about safety arose because visible wearable displays tie digital data to bodies: “What if my device showed that I didn’t know anyone? I would feel worried about my safety in a crowd.”

Milgram saw Familiar Strangers as a response to social overload. The mixed responses to the idea of wearable displays confirm his insight about the variability of desire for social interaction. As one woman said: “It depends whether I’m looking for people, for connections. When I’m on my own business I’d be more discrete.”

SYSTEM ARCHITECTURE

Our previous formal studies and anecdotal observations guided a design for a personal, wearable, wireless device that would capture and extend the essence of the Familiar Stranger relationship. These devices can either be attached to fixed objects, such as a bus stop platform, or carried/worn by individuals (see Figure 5). Each device is wireless and emits a short range (20m) radio beacon with a random but unique identifier. The wireless transceiver on the device allows each to be able to detect and record all of the other nearby beaconing devices. As two people approach one another, each device transparently detects and records the others unique ID. Over time each device accumulates a log of unique entries of people that have been previously encountered. There is no central server that stores, manages, or processes the data. The logs are unique and stored only on each individual device. Using this data there are several previously identified social factors that can be extracted and displayed.⁸

Amount

Intersecting the set of currently nearby detected Familiar Strangers with the stored set of those previously encountered, it is trivial to render a notion of amount of currently present Familiar Strangers.

History

We can measure how long or how many times each Familiar Stranger has been encountered as a notion of history. Using hysteresis to avoid measurement errors in the sampling, each device stores attributes for count and elapsed time with each log entry. Recurring encounters with Familiar Strangers simply increase the count or elapsed time attributes for that log entry. Later, by looking up the currently present Familiar Strangers in each log, a greater sense of established frequency, time, history, and familiarity is calculated.



Figure 5: Fixed (square) and mobile (circles) Familiar Stranger devices in context

Turf

The fixed beacons allow measurements related to place. Fixed beacons emit a signal to differentiate them from the mobile individually worn body devices. Fixed beacons are attached to objects in places by people. Typically, a person would tag a location that is perhaps significant or holds special meaning using a fixed device. The tagging is driven by the personal desires and interest of individuals.

A fixed beacon communicates and logs all of the strangers that pass by it. It also broadcasts this list to mobile devices in its vicinity. Nearby mobile devices intersect this broadcast list with their internal log of previously encountered strangers. This intersection is the set of strangers that have been encountered before and that have also been to this current place. The larger the set the more the current place is “your turf”.

DESIGN

The Familiar Stranger hardware prototype is based on the MicaDot2 Mote, a 23mm diameter wireless embedded processor. Motes are the design predecessors to Smart Dust [23] and operate using low power and short wireless connectivity, a perfect match to the Familiar Stranger design constraints of detecting nearby people and places.



Figure 6: Experience prototypes seen in context

Form Factor

The device needed to support easy viewing access for checking its status. Unlike mobile phones carried in pockets and bags, the Familiar Stranger device design took on several externally displayed form factors such as a belt clip, watchband slip-on, bracelet, and book bag clip (see Figure 6). The obvious tradeoff for ease of access is the semi-public display of the device’s status as commented on by users in the *Urban Walking Tour* study (see results).

⁸ We are also preparing to conduct an additional user study of 60 operational prototype devices in an urban setting.

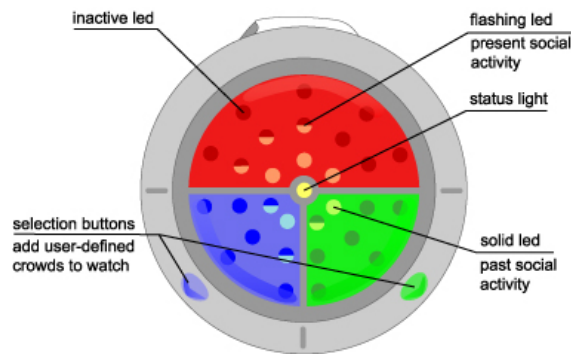


Figure 7: Interface for Familiar Stranger device

Interface

The major interface challenge was representing and interacting with complex social data on very small, low-resolution displays. It was also important to visualize the freshness of the real-time data and the passage of time. Finally, we avoided the look and feel of a tracking device by displaying Familiar Strangers *collectively* rather than as individuals.

The interface (see Figure 7) is a diffused circular lens divided into three color regions (red, green, and blue) with two corresponding selection buttons (blue and green). Using an array of concentric LED rings a user can see the degree of familiarity of a place. The red region renders the general state of familiarity by turning on LEDs corresponding to the amount of Familiar Strangers that you have passed who have also frequented the current location (solid LED) as well as the number currently nearby (pulsing LED). This provides a sense of history and freshness of data within a single display.

As discussed in the *Urban Walking Tour* study, not all Familiar Strangers are equivalent. Typically, a few have meaning attached to a particular place such as a bus stop, street corner, or club. Others may be ones in your own neighborhood. While the red area depicts the general state of familiarity, the blue and green are for specific personal groupings. Users' categorize the Familiar Strangers nearby by selecting the green (or blue) button. Later, when members of these groups are re-encountered, their presence will contribute to illuminating both the red (general familiarity) and green (or blue) personalized grouping.

TWO SCENARIOS

A woman who has recently graduated from college has moved to a new city and doesn't feel at home. The display on her device reinforces her growing sense of integration with her new neighborhood, and reassures her that familiar people are nearby, even if she does not recognize their faces. When she explores unfamiliar neighborhoods in the larger city, she is occasionally surprised to discover how many people around her she has encountered before.

In the midst of a frustrating day, an urban professional decides that he doesn't want to eat lunch in his usual spot.

After years at the same job, the large city seems more like a small town. He sees the same people every day in the same places. He wants to escape. As he walks quickly away from his work, he occasionally checks his device to see if there are any Familiar Strangers nearby. When he finds a street that the device tells him is completely unfamiliar, he chooses a restaurant. He feels as if he's exploring new territory and though he is still surrounded by other people, he feels much less crowded than he did 15 minutes ago.

CONCLUSION

The very essence of place and community are being redefined by personal wireless digital tools that transcend traditional physical constraints of time and space. New metaphors for visualizing, interacting, and interpreting the real-time ebb and flow of urban spaces will emerge. Crucial to this discussion will be the often ignored yet vital role of our Familiar Strangers. Without a concerted effort to develop new knowledge and tools for understanding the implications of these new technologies, computer and social scientists, city planners, and others run the risk of losing touch with the reality of our urban streets and their inhabitants. This paper initiates the groundwork towards exploring this space.

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