

Spotz: A Location-Based Approach to Self-awareness

Misha Sra and Chris Schmandt

MIT Media Lab., Cambridge, MA 02139

Abstract. This paper introduces the location-based mobile application Spotz that explores the persuasive qualities of sharing location information visually to promote behavior change. Spotz encourages users to become self-aware of the kinds of places they visit which can have motivational properties deriving from social feedback. The app displays a continually evolving graphic of relatively sized circles depicting the number and type of places at which the users check-in, including the option to upload this visual to social media.

1 Introduction

As the field of persuasive technology is focused on developing computing systems that attempt to change attitudes and behavior [1], employing self-reflection in persuasive technologies might be an effective means of supporting behavior change. The Spotz approach differs from previous location, exercise and social tracking applications by providing an opportunity for users to shape both how they see themselves and how they are perceived by habituating locations which are crowd designated as having a certain personality. Whereas previous applications use quantitative data gathering to create statistics of area covered or miles logged, Spotz builds a socio-location mirror of personal habits which users can examine and provide a pivot of self-persuasion for any number of changes from health to education and community involvement.

The importance of this work to Persuasive Technologies is twofold. First, this work presents a working smartphone location-based app that presents real world location check-in data to the user in ways that they can reflect upon and comprehend easily. Second, it presents the data in a way that makes it easily shareable across social media websites to build upon the complex idea of self-representation in online worlds for behavior change.

2 Previous Work

The abundance of smart mobile devices with sensors in an always-connected world enables the recording and sharing of a countless variety of personal data. If all this data are made available to users with an understanding of users' self-reflection needs [2] they can become more aware of their own behavior [3] and change behavior in areas ranging from health to sustainability [4,5]. People may

access and manage this data using various tools and make meaning of it with varying degrees of success for the purpose of self-knowledge [6]. For example, playful tools such as Fish'n'Steps [7] which ties progress in a virtual game to the number of steps walked by the user to Ubigreen [8] for affecting behavior change in the context of transportation, resource usage.

3 Personal Informatics

Personal informatics is a class of tools that help people collect personally relevant information for the purpose of self-reflection and self-monitoring. These tools help people gain self-knowledge about one's behaviors, habits, and thoughts [9]. A variety of data, both quantitative and qualitative about step count, physiology, moods or sleep are available to be collected and visualized. People may use this data for purposes of health management, self-motivation and record keeping.

There exists a lot of research on effective information visualization techniques to explore data for trends and patterns but not focused on personal data. There are a few projects that have applied visualization techniques on personal data. For example, Andry et al. have designed a diabetes visualization module for LifeSensor to optimize data collection as well as help patients explore relationships between their blood glucose levels and their diet [10]. Commercial products, such as Nike+, Fitbit or Motoactv (physical activity), Moodpanda (moods), Zeo (sleep), Klout (online influence), and Wattson (electricity), use information visualizations to assist users in exploring their data for information, patterns and self-motivation.

4 Application Design

Spotz is an easy to use mobile phone application for Android phones. It uses the familiar paradigm of 'checking-in' and builds visualizations for the user based on qualitative information about the places the user checks in at.

4.1 User Scenario

Jane is a college student in her mid twenties. She believes that she is a healthy eater and only goes to healthy restaurants and grocery stores who likes 'geeky' things. She downloads Spotz out of curiosity and every time she checks-in to Foursquare she does a parallel check-in to Spotz and reviews the results at the end of the week that surprise her.

Her user profile shows a visualization of the types of places she checked-in at during the week, a summary of the top places she visited, and recommendations for new places based on her personality as created by her use of the app. The visualization shows her as a predominantly geeky person with a little interest in healthy places contrary to her expectations. Reviewing the list of places she realizes that she has been going to the local cafe a lot more than she thought

she did. She recognizes that she rarely goes to healthy restaurants but instead favors the fast food restaurants at the nearby food court out of convenience. She wants to share her persona visualization with her friends on social media sites but decides to wait until she can alter the visual representation of the locations she visits by going to places that are representative of the type of places she wants herself to be associated with.

The app also allows her to ‘follow’ broad pre-programmed personality tags for places (healthy, fun, geeky) and user generated ‘buzz’ tags (best vegan chocolate cake, safe running trail) that are for very specific items or characteristics of a place. For e.g. following the ‘buzz’ trail of the vegan chocolate cake she may discover a neighborhood gas station store which would not be a normally recommended place for ‘healthy’ eating.

4.2 App Design

To ensure an easy to use app interface, the check-in part the app is modeled (Figure 1) after the popular location-sharing social app Foursquare. The intention was to create an app that is fun and easy to use yet is not obvious about its persuasive goals. Facebook was selected as the primary sharing platform given its popularity and an accessible API. As conventional understandings of human identity, representation, and social relations are being revised in the light of technological mediation [11], users now have means and reasons to share different facets of themselves, projecting a public self that may very well be different from the private self. By providing interesting information to the user about their check-in behavior in a playful manner, the app trusts self-reflection to emerge as the primary behavior change mechanic.

4.3 App Functionality

Users can check-in to places using the GPS hardware in the mobile device to display a list of nearby locations or by scanning NFC stickers at places. Check-in is an active user selection process following which the user is presented with the option of ‘tagging’ that location (Figure 2). It is this ‘tagging’ characteristic that forms the basis of building a location’s personality and based on the location’s personality, the personas of users who visit that location emerges.

4.4 Persuasive Elements

In Spatz, multiple persuasive strategies [12] have been implemented in various elements. The continually evolving user persona visualization was used as a new type of check-in data representation, different from the lists or representations on a map. The user participates in the creation of their persona in two ways. First, by visiting a location and ‘tagging’ that location the user assigns a personality to the place (Figure 2). Based on the predominant ‘tag’ for a location, its personality emerges, even though it’s just a matter of time when people start

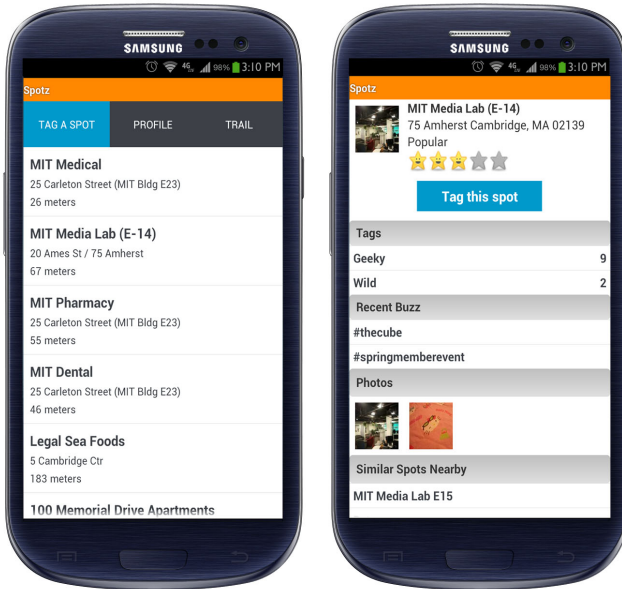


Fig. 1. User selects and tags their current location, contributing to creating a personality of the location which in turn affects the persona of the people who check-in at this location

‘tagging’ it differently and entirely change the places’ personality. Second, when a user visits a place, they earn a ‘tag’, which is the same ‘tag’ as the location personality, thereby creating the idea of ‘you are where you go.’ In order to control the visualization of their persona, the user need only check-in at places with the personalities they want associated with them. For example, if a user wants to project a ‘healthy’ persona, they may choose only to check-in at places that are crowd tagged ‘healthy’, thereby earning a ‘healthy’ tag and thus increasing the size of their ‘healthy’ circle in the persona visualization or they could influence and change the ‘nice’ tag of their favorite place to ‘healthy’ by checking-in there frequently and asking friends to do the same.

In order to reward the user for making an effort to visit new places, the adventurous rating (Figure 2) was implemented as a new type of positive personality characteristic that people would want associated with them. The idea was to use a simple star rating mechanism that can at a glance provide information to the user thereby motivating them to visit newer places to increase their adventurous rating.

The following design strategies were incorporated: 1) simple paradigm of checking-in (familiarity); 2) adventurous rating (player empowerment); 3) the opportunity to ‘tag’ locations (player empowerment); 4) the opportunity to create special ‘tags’ for (Figure 3) characteristics of the location (player empowerment); 5) creating of user persona (Figure 3) based on their location check-in information (game interaction); 6) animated visual representation (Figure 3) of



Fig. 2. Left: Visualization shareable to Facebook and list of recent places tagged by user. Right: Location personality graph and 'buzz' associated with that location.

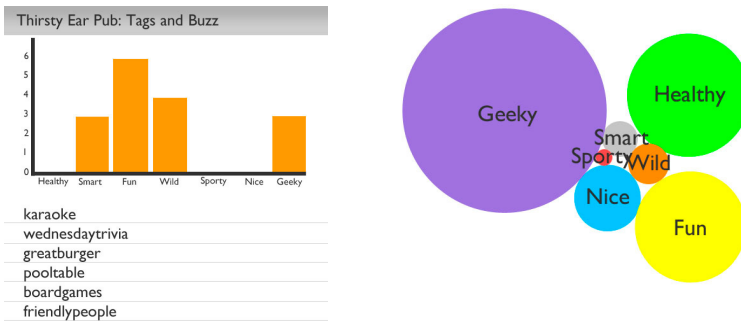


Fig. 3. Left: Enlarged location personality graph with 'buzz' associated with that location. Right: User persona visualization detail.

user persona (game interaction); 7) ability to 'follow' and receive information about new places nearby based on the location personality (timely information, minimum effort, low cognitive load); 8) the ability to 'follow' and receive information about specific objects (newness, exploration); 9) opportunity to share persona information online (social) (Figure 3).

5 Preliminary Evaluation

Spotz was given to a small group of student colleagues and received positive verbal feedback on the design of the visualization. It was suggested to include more social elements specifically a friend feature which would require more attention to privacy and security of user data. However, to move the project forward, a collaboration with existing location-based apps would be ideal as this work does not aim to reinvent what has already been successfully done but to provide a different perspective on viewing location information and providing the opportunity to reflect upon data.

References

1. Fogg, B.J.: *Persuasive Technology: Using Computers to Change What We Think and Do*. Morgan Kaufmann Publishers, San Francisco (2003)
2. Li, I., Dey, A.K., Forlizzi, J.: Understanding My Data, Myself: Supporting Self-Reflection with UbiComp Technologies. In: *UbiComp 2011* (2011)
3. Carver, C., Scheier, M.F.: *On the self-regulation of behavior*. Cambridge University Press (2001)
4. DiClemente, C.C., Marinilli, A.S., Singh, B., Bellino, E.: The Role of Feedback in the Process of Health Behavior Change. *American Journal of Health Behavior* 25(3), 217–227 (2000)
5. Seligman, C., Delay, J.M.: Feedback as a Means of Decreasing Residential Energy Consumption. *Journal of Applied Psychology* 62(4), 363–368 (1977)
6. Li, I., Dey, A.K., Forlizzi, J.: A Stage-Based Model of Personal Informatics Systems. In: *CHI 2010*, pp. 557–566 (2010)
7. Lin, J.J., Mamykina, L., Lindtner, S., Delajoux, G., Strub, H.B.: Fish'n'Steps: Encouraging Physical Activity with an Interactive Computer Game. In: *Dourish, P., Friday, A. (eds.) UbiComp 2006*. LNCS, vol. 4206, pp. 261–278. Springer, Heidelberg (2006)
8. Froehlich, J., Dillahunt, T., Klasnja, P., Mankoff, J., Consolvo, S., Harrison, B., Landay, J.A.: Ubigreen: Investigating a Mobile Tool for Tracking and Supporting Green Transportation Habits. In: *CHI 2009*, pp. 1043–1052 (2009)
9. <http://personalinformatics.org/>
10. Andry, F., Naval, G., Nicholson, D., Lee, M., Kosoy, I., Puzankov, L.: Data Visualization in a Personal Health Record using Rich Internet Application Graphic Components. In: *HEALTHINF 2009*, pp. 111–116 (2009)
11. Yaszek, L.: *The self wired: technology and subjectivity in contemporary narrative*. Routledge, New York (2002)
12. Khaled, R., Biddle, R., Noble, J., Barr, P., Fischer, R.: Persuasive Interaction for Collectivist Cultures. In: *Proc. of The Seventh Australasian User Interface Conference*, vol. 50, pp. 73–80 (2006)