
Sharing & Exploring Quantified-Self Data on In-Place Experiences and Emotions

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Abstract

With the emergence of the Quantified Self movement and Personal Informatics tools, applications and devices that collect data about people's everyday lives have become increasingly common. Often this data is focused on the individual and used to achieve personal goals, like becoming fitter, happier or to assist remembering personal memories. However, this individual and personal data collected in situ can also relate to shared places and experiences. When this data is shared with others, it could mediate intimate personal relationships between people and the personal connections that people have with places in the urban environment. This paper outlines a work-in-progress which aims to investigate the relevance of social relationships on sharing and exploring the Quantified-Self data of people's in-place experiences and related emotions with others, and how this could influence the experience of the place in which such situated data is captured or shared.

Author Keywords

Quantified Self; Personal Informatics; Urban Interaction Design; Place Attachment; Affect; Social Relationships.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous;

Introduction and Background

With the vision of ubiquitous computing [10] becoming increasingly realized, a wide range of information- and communication technologies have been deployed in the urban environment. Commercial endeavors and government institutions have adopted a technology-driven, top-down approach to the design of smart cities. These smart city solutions operate at an urban level and typically address infrastructure issues aimed at improving efficiency and productivity. For example, sensors incorporated in the fabric of the urban environment are being used to sense traffic flows in order to reduce traffic congestion.

Also the people inhabiting the city currently carry a range of mobile devices like smartphones, smartwatches and activity trackers that enable them to track various aspects of their everyday lives and allow them to interact with and experience the city in novel ways. Complementary to the smart city approach, *Urban Interaction Design* [9] takes a bottom-up, human scale design approach. It aims to identify the needs, desires, routines, behaviors and experiences of people in the urban environment, in order to inform the design of innovative technological devices and services.

Personal Informatics and the Quantified-Self movement also use a range of mobile devices as wearable sensors for collecting data on different aspects of people's everyday lives. The goal typically is to use this data to gain self-knowledge, self-insight and to promote positive attitudes and behaviors. Popular metrics to

track include physical activity (e.g. running apps like Nike+) diet (e.g. MyFitnessPal), moods and emotions (e.g. MoodPanda, ComfortZones) and memories (e.g. Memoir, UMap) [1][3][5]

Where smart city projects typically collect data at a city scale level, Quantified Self systems and Urban Interaction Design projects typically collect data at the level of the individual citizens. Within both fields, there has been an increasing interest in the role of emotion and affect, which for urban interaction design-projects typically centers on the topic of safety. The Emocycling project[11] for example attempts to utilize aggregated arousal level data of cyclists in the city to inform urban planning. In this study, participants were equipped with wearable technology to measure physiological data in combination with a GoPro-camera and a GPS-tracker to make it possible to geolocate the measurements and detect areas of negative arousal in the city. Whenever increased levels of stress were detected, the GoPro camera would automatically take a picture. The aim was to identify hotspots of stress for cyclists in the city, enabling non-professionals to use technology to automatically identify potential danger spots in the traffic infrastructure that need to be redesigned. This example illustrates that the data collected by a Quantified-Self system like an activity tracker could not only be valuable for the individual using it, but potentially could also be used to, in this case, improve the traffic infrastructure of a city.

Using similar wearable technology and metrics, artist Christian Nold [7] investigated people's emotional relationships with places in the urban environment by measuring people's arousal levels as they walked freely through the city. Combined with GPS data, participants

interpreted and contextualized their own data after the walk, resulting in an annotated “emotion map” of the city. Although some places showed peaks in arousal levels because of the specific environmental characteristics like traffic or architecture, these emotion maps were also filled with personal stories and emotions, indicating people’s strong and meaningful personal connection with certain places in the city.

Such data collected by a Quantified-Self system could also be used to enhance and augment an individual’s experience of the urban environment. Quercia, Schifanella & Aiello [8] improved the experience of walking routes through the urban environment as provided by traditional route planners by taking into account the emotional responses that places evoke in people. This was done by crowdsourcing geotagged pictures on Flickr and performing (sentiment) analysis on metadata such as number of pictures in a certain area, number of views, comments and tags. This data was subsequently used to successfully determine more quiet, beautiful or happy walking routes in London and Boston. An improvement suggested by the researchers was to include personalization options that would take into account an individual’s personal history with a place. This data could come from a QS-system as proposed by Matassa & Rapp[4] who prototyped and tested a QS-system for cyclists which aims to enhance an individual’s remembering process by connecting personal experiences with the places in which they took place. It in situ alerts a cyclist of the of the cyclist’s personal emotional connection with a place.

Work in Progress

My thesis follows in these footsteps and aims to investigate how data tracked by QS systems could be

applied to the domain of smart cities. The personal experiences and emotions typically tracked by a QS systems or Personal Informatics application to assist that specific person’s process of remembering or to promote positive thoughts and feelings for that specific individual, could, when shared, potentially also be valuable to others.

Sharing emotional experiences of places is a powerful social practice, which can enable the reliving of an experience and improve social ties [6][7]. Nold noticed that when participants shared their personal relationship with a place with other participants, this enabled them to relive the in-place experience and connect with other participants, in particular when multiple participants had emotions and personal stories related to the same location[7]. The main motivation for backpackers to use social media applications is that they enjoy reliving mutual past travel experiences related to places that they had visited together, while elderly people come together in person to share memories and stories to experience a sense of community[6].

Sharing arousal maps or mementos that show a person’s emotions related to urban places are also expected to increase intimacy between loved ones[2]. An application or services that would allow the sharing of one’s emotional relationship with a personally significant place with other people, like family, friends or partners, could potentially therefore also reinforce social connectedness, even between people who are physically far apart. One could think of sharing their connection to personally significant places while living abroad with family and friends back home. This would give the people at home a peek of what everyday life in

another country is like and create a sense of being together apart, thus improving social connectedness.

Two of the research questions which could be of particular interest in the context of the workshop are:

- What would be the relevance of social relationships on sharing and exploring data regarding people's personal experiences and emotions connected to places in the urban environment?
- To what extent would it be possible to improve the experience of a place by in situ sharing other people's experiences and emotions related to that place?

Methodology

The first phase of this work-in-progress will consist of developing a better understanding of how people's personal stories and emotional experiences are currently connected to places in the urban environment. To this end, a case study is currently being conducted using a mixed methods approach. For the quantitative measurement of the objective emotional experiences based on arousal levels, test runs are currently being carried out to determine which metrics would practically be most suitable (i.e. physiological recordings in the form of galvanic skin response or behavioral observations in the form of facial expressions).

To contextualize these quantitative measurements, qualitative measurements of the subjective emotional experiences will be done using the ethnographical-informed Walking & Talking method [9] (i.e. walking interview between a researcher and participant along a participant's personally significant places in the urban

environment). This is expected to reveal the stories and social relationships connected to places in the urban environment and with which social relationships participants would be willing to share such data.

An evaluative map technique in the form of a mock up emotion map of the city containing emotions and stories related to places from strangers, (intimate) personal relationships, professional relationships and cross-cultural relationships, will be used to investigate the influence of social relationships on exploring such data.

The second phase of the research is expected to take a speculative design approach by using design fictions to create and explore concepts for technological devices and services that utilize the emotional and social connection people have with places in the urban environment in novel ways.

Conclusion

With the emergence of the Quantified-Self movement, applications and devices that are able to collect data related to in-place experiences and emotions to achieve personal goals, like becoming happier or to assist remembering personal memories, have become increasingly common. However, when this data is shared with others in a smart city context, it could mediate intimate personal relationships between people and the personal connections that people have with places in the urban environment. Two "data relationships" which could be of particular interest are personal experiences and emotions connected to places in the urban environment, and the influence of social relationships on sharing and exploring such data.

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Personal biography

Shenando Stals is a doctoral student at the Centre for Interaction Design of Edinburgh Napier University. He has a special interest in technologically augmented, data-rich urban environments and the human activities, experiences and behaviors that occur in smart city environments, now and in the near-future. His research in the field of Urban Interaction Design employs a combination of qualitative, quantitative and speculative methods to investigate people's personal stories and emotions connected to places in the urban environment that are meaningful to them on a personal level. He has a background in Computer Science & Software Engineering and obtained a master degree in Human-Technology Interaction from the Eindhoven University of Technology (The Netherlands).

Short description of two data relationships

With the emergence of the Quantified-Self movement, applications and devices that are able to collect data related to in-place experiences and emotions to achieve personal goals, like becoming happier or to assist remembering personal memories, have become increasingly common. However, when this data is shared with others in a smart city context, it could mediate (intimate) personal relationships between people and the personal connections that people have with places in the urban environment. Two "data relationships" I would be particularly interested in discussing at the workshop, are the personal experiences and emotions connected to personally

significant places in the urban environment, and the influence of social relationships on sharing and exploring such data.

References

1. Chris Elsdon. 2014. Situated Remembering with Digital Technology. *Proceedings of the 2014 Companion Publication on Designing Interactive Systems*, ACM, 145–149. <http://doi.org/10.1145/2598784.2598786>
2. Lucien Leahu, Steve Schwenk, and Phoebe Sengers. 2008. Subjective objectivity: Negotiating emotional meaning. In *Proceedings of the 7th ACM Conference on Designing Interactive Systems (DIS '08)*, 425–434. <http://doi.org/10.1145/1394445.1394491>
3. Ian Li, Jon Froehlich, Jakob E Larsen, Catherine Grevet, and Ernesto Ramirez. 2013. Personal Informatics in the Wild: Hacking Habits for Health & Happiness. *CHI '13 Extended Abstracts on Human Factors in Computing Systems*, ACM, 3179–3182. <http://doi.org/10.1145/2468356.2479641>
4. Assunta Matassa and Amon Rapp. 2015. Map: Making: Designing a Mobile Application for Enhancing Memories' Retrieval. *Proceedings of the 17th International Conference on Human-Computer Interaction with Mobile Devices and Services Adjunct*, ACM, 994–1001. <http://doi.org/10.1145/2786567.2794318>
5. Assunta Matassa, Amon Rapp, and Rossana Simeoni. 2013. Wearable Accessories for Cycling: Tracking Memories in Urban Spaces. In *Proceedings of the 2013 ACM Conference on Pervasive and Ubiquitous Computing Adjunct Publication*, (Ubicomp'13 Adjunct), 415–423. <http://doi.acm.org/10.1145/2494091.2495973>
6. Raturaj Mody, Katharine Willis, and Roland Kerstein. 2009. WiMo: location-based emotion tagging. In *Proceedings of the 8th International*

Conference on Mobile and Ubiquitous Multimedia (MUM '09), 1-4.

<http://dx.doi.org/10.1145/1658550.1658564>

7. Christian Nold. 2009. *Emotional Cartography – Technologies of the Self*. Creative Commons.
8. Daniele Quercia, Rossano Schifanella and Luca Maria Aiello. 2014. The Shortest Path to Happiness: Recommending Beautiful, Quiet, and Happy Routes in the City. In *Proceedings of ACM HyperText (HT'14)*, <http://doi.org/10.1145/2631775.2631799>
9. Shenando Stals, Michael Smyth, and Wijnand IJsselsteijn. 2014. Walking & Talking: Probing the Urban Lived Experience. *Proceedings of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational*, ACM, 737–746. <http://doi.org/10.1145/2639189.2641215>
10. Mark Weiser. 1999. The Computer for the 21st Century. *SIGMOBILE Mob. Comput. Commun. Rev.* 3, 3: 3–11. <http://doi.org/10.1145/329124.329126>
11. Peter Zeile, Bernd Resch, Jan-Philipp Exner, and Gunther Sagl. 2015. Planning Support Systems and Smart Cities. 209–225. <http://doi.org/10.1007/978-3-319-18368-8>