
Using historical information to support shared encounters

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Abstract

Based on the experience of deploying public displays at academic conferences, this paper discusses interactive processes of encounters and challenges of supporting them with historical data. Historical data can be useful for dynamically assessing various aspects of encounters; however, there are issues such as privacy violation that must be taken seriously in designing computational support for shared encounters.

Keywords

encounter, shared, historical data, social networks, social navigation, privacy

ACM Classification Keywords

H5.2. User Interfaces, H5.3. Group and Organization Interfaces.

Introduction

Today, people create and interact with digital media in various physical spaces using mobile phones, digital cameras, notebook computers, public displays, and so on. In addition, historical data about people, places, and physical objects are increasingly captured and accumulated in various forms, which can be used to support human-human interactions in encounters.

When we introduce ourselves to others at social events such as academic conferences, we often reveal our historical information by telling stories about our past experiences. Historical data could similarly be revealed on personal devices or public displays to support existing practices such as self-introduction. However, historical data have many other uses. For example, historical data can be revealed *before* we initiate conversations with strangers, thereby supporting the process of shifting from *unfocused* interactions to *focused* interactions[1].

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CHI 2007, April 28 – May 3, 2007, San Jose, USA

ACM 1-xxxxxx

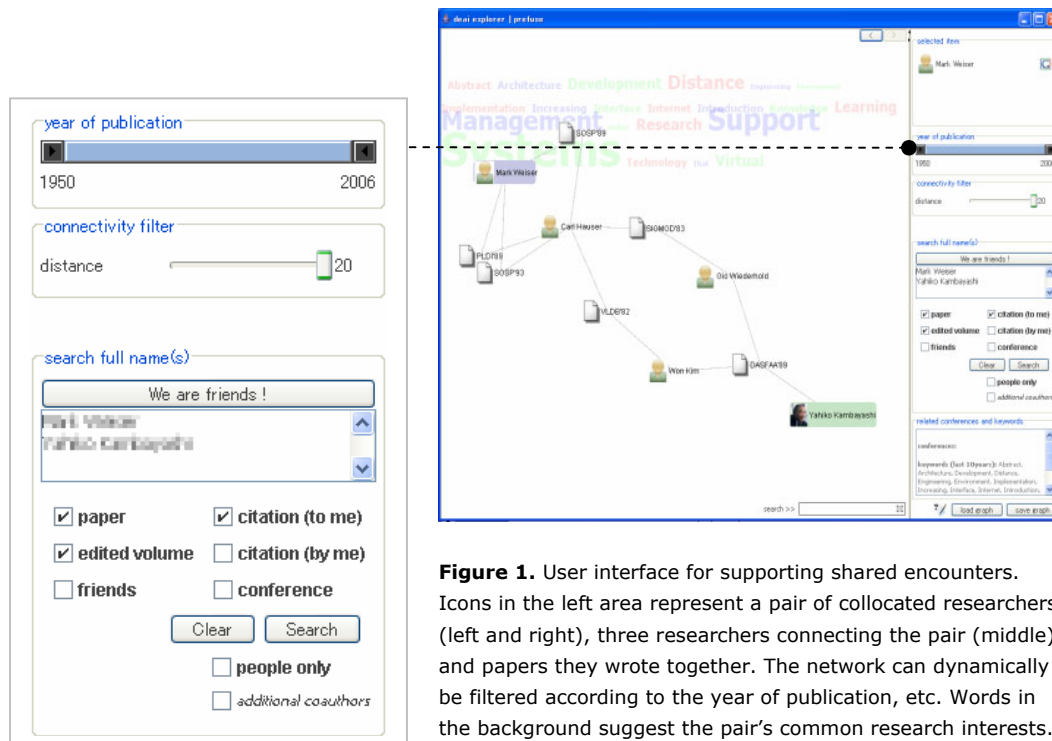


Figure 1. User interface for supporting shared encounters. Icons in the left area represent a pair of collocated researchers (left and right), three researchers connecting the pair (middle), and papers they wrote together. The network can dynamically be filtered according to the year of publication, etc. Words in the background suggest the pair's common research interests. It was implemented by using the prefuse visualization toolkit[5]

Historical data such as publication databases, web search histories, and records of email exchange embody social relations. Extracting human relationships from any kinds of historical data, however, would cause serious privacy problems. Using public data only, it is possible to build context-aware computing systems that derive, abstract, and visualize historical social relations so as to provide collocated people with shared

conversation topics as well as cues for initiating conversations.

Will context-aware technologies increase the chances to make friends with strangers, such as pedestrians in urban intersections? Technologies, however, should not force people to be friends with each other. Interestingly, there are various lightweight interactions, which are much less costly than making friends. It can be argued that such interactions could meaningfully be augmented with context-aware technologies and historical data.

Supporting shared encounters in academic conferences: a case study

Academic conferences offer many benefits that virtual meeting tools cannot easily offer: rich, interactive presentations and demonstrations, various opportunities to socialize and make new friends, serendipitous discoveries of relevant ideas, people and projects, and so on. A system called *DeaiExplorer*[2] (<http://www.tkl.iis.u-tokyo.ac.jp/socialnet>; *deai* is a Japanese word for encounter) was developed to enhance conference attendees' experiences using technologies for supporting encounters.

The system communicates with the RFID conference badges of nearby conference attendees, derives academic social networks from a history-rich publication database called DBLP[3], and visualizes direct and indirect connections among collocated attendees on public displays (see Fig. 1). It was first deployed at International Conference on Data Engineering (ICDE 2005) in Tokyo.

Although the system helped users to communicate with strangers, the system's usefulness largely depended on

the contents available for each user. Since we cannot always control the contents, naive systems could unexpectedly show too little or too much information. Another issue is related to passive observers around the main users in front of a public display. Shared encounters could be supported considering passive observers as well.

The system was also deployed at a few other conferences without using RFID, i.e., users manually input their names using a keyboard. RFID was useful for improving the system's usability; however it significantly increases the cost of deployment. Also, keyboard inputs allowed one to specify any names.

Meaningful lightweight interactions

RFID can trigger information about a pair of strangers standing in front of a public display *before* they initiate conversations or focused interactions[1]. Systems can support unfocused, lightweight interactions that could eventually lead to meaningful encounters, and, arguably, lightweight interactions can be meaningful in themselves.

It is uncommon that someone overhearing strangers' conversations in a crowded elevator easily joins the conversations even if he is interested in the topics. People are more likely to break in and interact with strangers in a party or a coffee break of an academic conference. Also, extraordinary events such as an earthquake are likely to motivate strangers to interact with each other although such interactions may not always lead to sustainable social relationships.

The difficulty of assessing strangers' openness to shared encounters depends on settings. One might

assume that people in sociable party events would be more open to interactions with strangers than usual. When there are few cues for assessing the openness, one might miss opportunities for meaningful encounters.

Revealing one's presence and level of openness could be similar to showing a status icon in IM applications. Mobile and pervasive technologies introduce the challenges of supporting awareness for meaningful encounters in digitally-augmented physical spaces.

Without engaging in focused interactions, people could improve community solidarity and a sense of belonging through a means to increase awareness of Familiar Strangers[4]. History-rich tools[7] enable social navigation, which can be viewed as a type of lightweight interactions and is particularly useful for supporting newcomers to an environment. Other types of lightweight interactions could involve semi-automatic peer-to-peer exchange of personal information, in which historical data could be used to manage reputation and trust.

Implications of historical data

Visualizing historical data about people, things and places can positively or negatively impact shared encounters. Like wear and tear of library books or black streaks on guardrails, historical data can be collective, anonymous, and unintentional. Other historical data may be individual, traceable, and deliberate like resumes and pedigrees.

Historical data can provide richer cues for encounters. When we shake hands with fishermen, the feel of their hands can immediately tell us something about them. Or a CHI'07 attendee wearing a CHI'97 t-shirt may

encounter other attendees who were also at CHI'97. Although historical information tells something about people we encounter, it normally tells little about their willingness to encounter and provides little support for interactive processes of encountering.

One could convey willingness to encounter by firm handshakes, welcoming facial expressions, or eye contact. Physical and social settings (e.g., a conference banquet) can also suggest a certain level of willingness. Although it is not clear how historical data could enhance such cues (or introduce new types of cues), willingness doesn't seem to be a static feature of people or settings. If willingness mutually emerges through dynamic interactive processes, systems should be attentive to such processes and dynamically present historical information to enrich the context.

People have simultaneous need to disclose their information and protect their privacy[6]. Privacy implications of historical data change when they are processed and presented in different ways. People would not want their personal data collected without a clear value proposition. There are technologies for preventing unwanted data capture; however, it is extremely difficult to control how data are processed and used once they are captured. Privacy again is a critical issue and it could potentially conflict with the interest to build history-rich tools for supporting shared encounters.

Conclusion

In order to find the right way to use historical data for supporting shared encounters, we need to understand

how people encounter today as well as how people could encounter with the support of dynamic pervasive media. We also need to understand people's larger context and goals rather than narrowly focus on making people encounter anywhere at anytime. Also, it would be an interesting challenge to design for serendipity in shared encounters.

Acknowledgements

This research was supported by MEXT Special Coordination Funds for Promoting Science and Technology No.13006

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