Chapter 12
Supporting Social Interaction in Campus-Scale Environments by Embracing Mobile Social Networking

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ABSTRACT

With the popularity of smart phones, the warm embrace of social networking services, and the perfection of wireless communication, mobile social networking has become a hot research topic. The characteristics of mobile devices and requirements of services in social environments pose challenges to the construction of a social platform. In this chapter, the authors elaborate a flexible system architecture based on the service-oriented specification to support social interaction in a university campus. For the client side, they designed a mobile middleware to collect social contexts such as proximity, acceleration, and cell phone logs, etc. The server backend aggregates such contexts, analyzes social connections among users, and provides social services to facilitate social interaction. A prototype of mobile social networking system is deployed on campus, and several applications are implemented to demonstrate the effectiveness of the proposed architecture. Experiments were carried out to evaluate the performance (in terms of response time and energy consumption) of our system. A user study was also conducted to investigate user acceptance of our prototype. The experimental results show that the proposed architecture provides real-time response to users. Furthermore, the user study demonstrates that the applications are useful to enhance social interaction in campus environments.

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INTRODUCTION

With the development of wireless communication and pervasive computing technology, smart campuses are built to benefit the faculty members and students, manage the available resources, and enhance user experience with proactive services. A smart campus ranges from a smart classroom (Shi, 2003; Suo, 2009; Yau, 2003; Griswold, 2004; Murray, 2003; Barkhuus, 2005), which benefits the teaching process in an enclosed environment, to an intelligent campus (Halawani, 2003; Rohs, 2003; Dong, 2009) that provides lots of proactive services in a campus-scale environment. Many contexts such as location, activity and user profiles are widely adopted by existing work to provide proactive services, social contexts (e.g., the proximity and the communication history), however, are rarely concerned in their systems. Campus is a social environment where college students have lots of social interaction with each other. However, little research has been conducted on social aspects, e.g., supporting social interactions.

Social interaction with others is important for college students. On one hand, social interaction is vital to human health, both mentally and physically. The presence of social interaction with others significantly enhances the individual’s abilities to cope with stress and reduces the probability of depression and suicide in campus. On the other hand, social interaction may help college students acquire knowledge and skills from which they will benefit throughout their life, especially for freshman. Amount of knowledge about public infrastructures or arrangements of campus life is shared through interactions with seniors, which benefits the quick adjustment for the freshmen. Several examples of frequent questions asked in a university campus are shown as follows:

• Whether the study lounge is available?
• Who is available to play basketball with me?
• Whether my friend is in the cafeteria?

Nowadays, Social Networking Sites (SNS) such as Facebook, MySpace, and Twitter are very popular for college students. Tens of millions of college students spend numerous hours logging on such sites, communicating with their friends, and sharing media in their community. With the development of wireless communication and smart phones, social networking sites are going mobile, which promotes the emergence of mobile social networking. IDC (International Data Center) predicts that the user number of smart phones will reach 2 billion in 2014. The explosive growth of user number of smart phones makes it valuable to perform research on mobile devices. Different from Web-based social networks, Mobile Social Network (MSN) is capable of continuous, seamless sensing, which allows us to obtain contexts from the physical world. As shown in Figure 1, MSN collects various contexts through mobile phone sensing, such as location, text message, phone records, etc. All those contexts present social interaction among people. By analyzing those contexts, we can get a number of high-level semantic information, such as social relationship, transportation mode, user activity, etc. Those semantic information benefits the design of proactive services. The mobility of MSN endows data with spatiotemporal information, which benefits the understanding of contexts where the user situates. Furthermore, MSN makes it possible to provide ego-centric services for users anywhere, anytime to enhance user experience. The MSN outperforms Web-based social networks with the support to social interactions in the real world. It makes full use of the smart phones to extract social contexts by analyzing sensing data and provides social services. Thus we introduce MSN into the built of smart campuses to support social interaction among faculty members and students.

However, the support to social interaction in campus is still discontented. In comparison with conventional face-to-face social interactions, smart campus should additionally support intelligent social services, such as friend search and