Pervasive System에서 Context-Aware 기술을 이용한 People-Centric Distress Broadcast 기법 설계

A Design of People-Centric Distress Broadcast Scheme Using Context-Aware Technology in Pervasive Systems

사이레네오 도피타스, 나 인 호
군산대학교

Cyreneo S. Dofitas Jr., In-Ho Ra
Kunsan National University

Abstract

Recent advances in WSN and the wide use of social sensing technologies have been changing our daily lives. In the process of creating intertwining connections and interconnections greatly influencing on the way we communicate with other people, WSN and social communication media have a number of important capabilities that support their utilization in distress broadcast during emergency situations. This paper proposes a system model that makes better utilization of WSN and social sensing capabilities in sending out distress messages to the intended recipients more efficiently and effectively.

Ⅰ. Introduction

WSN and social networks used as a social communication media have significant capabilities that support its potential utilization in distress broadcasting. These potentials can benefit everybody and aid people for fast response during emergency situations where it enables us to send messages to different receivers. Although social networks are global in nature, personal or group communication is an usual way for people to help them build their friendships with the interconnection information of a family or any other personal relationships[1], and to make easy determination of locations of recipients[2]. In this paper, we propose a system model for people-centric distress broadcast in a pervasive system using context-aware and location-based method to enhance capabilities of delivering distress messages to a recipient in a reliable and accurate manner.

Ⅱ. Related Works

The research in [3] is a study on an on-campus emergency rescue and alert management service which relies on localized responses, using Bluetooth or WiFi to achieve minimal response time and maximal availability. The study in [4] presents a mobile marketing platform enabling the advertisement of services in mobile markets. It recomm- ends advertisement and offering based on social-network properties and human for the preference. In [5], a context and pref- erence-aware Location-based database server is introduced, currently under development, which delivers personalized services to its customers based on the surrounding context.

Ⅲ. System Model

People-centric sensing includes sensor networking, mobile computing, and social networking. It utilizes mobile electronic devices with wireless sensors. Therefore the exact location of a user using mobile devices can be easily monitored or determined by GPS information.

In a context-aware pervasive system, if a user sends a message, the application identifies the message according to its context. And it forwards the message to the nearest online person and to available services.

A. Participatory

As shown in figure 1, it uses voluntary participants in the social network to collect data from a large area [5]. Distress messages are sent to participatory with a simple personal information including name, profile, location, time, user's activity and etc., as shown in figure 2.

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B. Context-aware

In this process it communicates with the sensors for identifying the context for collection and presentation of attributes by using key values. For the exact analysis of user's activities in a message, a comprehen- sive interpretation method should be utilized in the participatory stage. In case of distress broadcast, it will get the name, distress activity information, location, time. And then established results will be provided to the next step, the decision support scheme in figure 2.

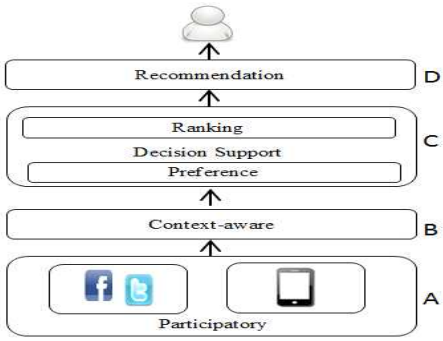

Figure 1. Conceptual Architecture

A.<username><Location><time><activity>
Example
B.<JuliaRoberts><GPS Location coordinates> <21:30>
<Need Help, My car has flat tire, I need to go home early>

Figure 2. Scenario

C. Decision Support

A preference method that performs information classification, learning and filtering process for the retrieved data based on the user's behavior is necessary in decision support. In this phase, the system has to select the preference dada needed for a specific user. It classifies the user's preference based on the type of behavior described in the message. There is an option to select recommendations that are suited most to the following user activity. In addition, we propose a ranking mechanism to support reliability and fairness to rank specific objects such as person, organization and other key values based on social information. Principles extracted from the social models could be applied when it is needed to define solutions for service ranking as shown in figure 3. On a technical point, the keyword values associated with the entities can be ranked. Options can be used for the ranking process based on the knowledge level of the user's request. The user can select options to refine results with some parameter.

D. Recommendation

Finally, the system will recommend and present the best or alternative solution to the user. the example of predicted result as shown in figure 3.

Recommendation Results
Rank Preference
<1><Friend Tom Cruise house near 2 miles away>
<2><Tire Services near 2 miles away>
<3><Call car Towing 123456789>
<4><Car Taxi Cab 215423654>

Figure 3. Predicted Result

IV. Conclusion

The integration of people-centric sensing into WSN is supposed to be an indispensable social communication medium that increases the application possibilities greatly. This paper presents a design of system model for distress broadcast utilizing Twitter and any other social network platforms. The proposed frameworks will be developed to fully utilize its capabilities for realizing the integration of social and sensor network.

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