Intelligent Data Collection and Dissemination Application with Wi-Fi Direct

Chenghao Xu and Wei Song

Faculty of Computer Science, University of New Brunswick, Fredericton, Canada

ABSTRACT

Mobile Crowd Sensing (MCS) is a large-scale sensing paradigm which makes effective use of the power of user-companioned devices, like mobile phones, smart vehicles and so on. Instead of deploying static and expensive sensor networks in urban areas, MCS leverages the sensors embedded in mobile phones and the mobility of mobile phone users to sense their surroundings, and utilizes the existing communication infrastructure. However, several important problems in this filed have not been fully solved, which makes it still in its infant stage. Two typical problems are how messages about tasks are disseminated to users and how data from users are collected and transmitted to servers. In this poster, a realistic software architecture of a typical MCS system is demonstrated.
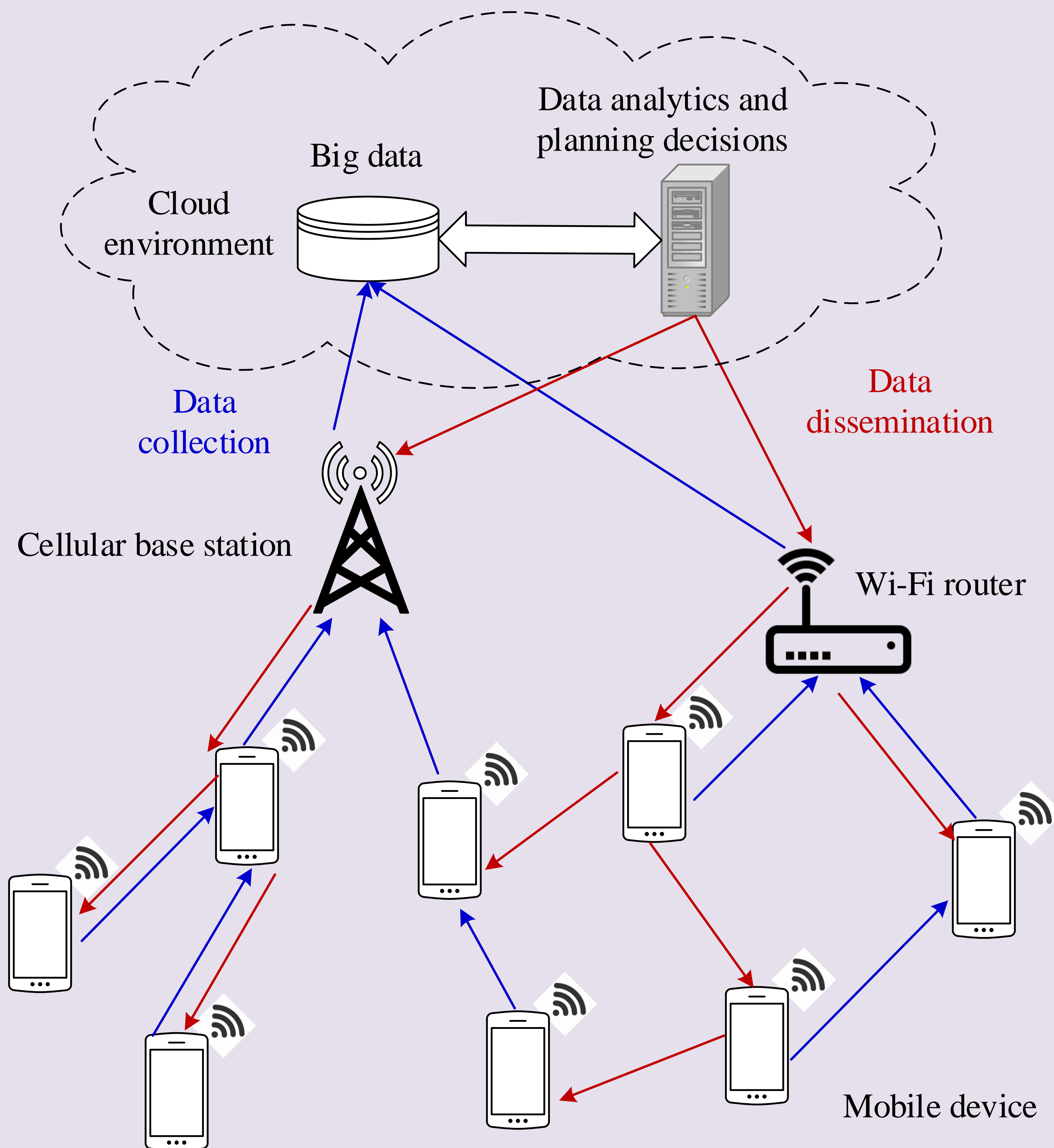
CONCEPTUAL ARCHITECTURE

Fig.1. Conceptual Architecture

Fig. 1 shows a conceptual architecture of our system. We can briefly divide the system into two parts, server and clients. In this system, we use Wi-Fi Direct to facilitate data transmission between clients, which significantly reduces data costs and improves participators' motivation. Also, many disaster areas may have few available base stations and Wi-Fi Direct can make this system work well in those situations.
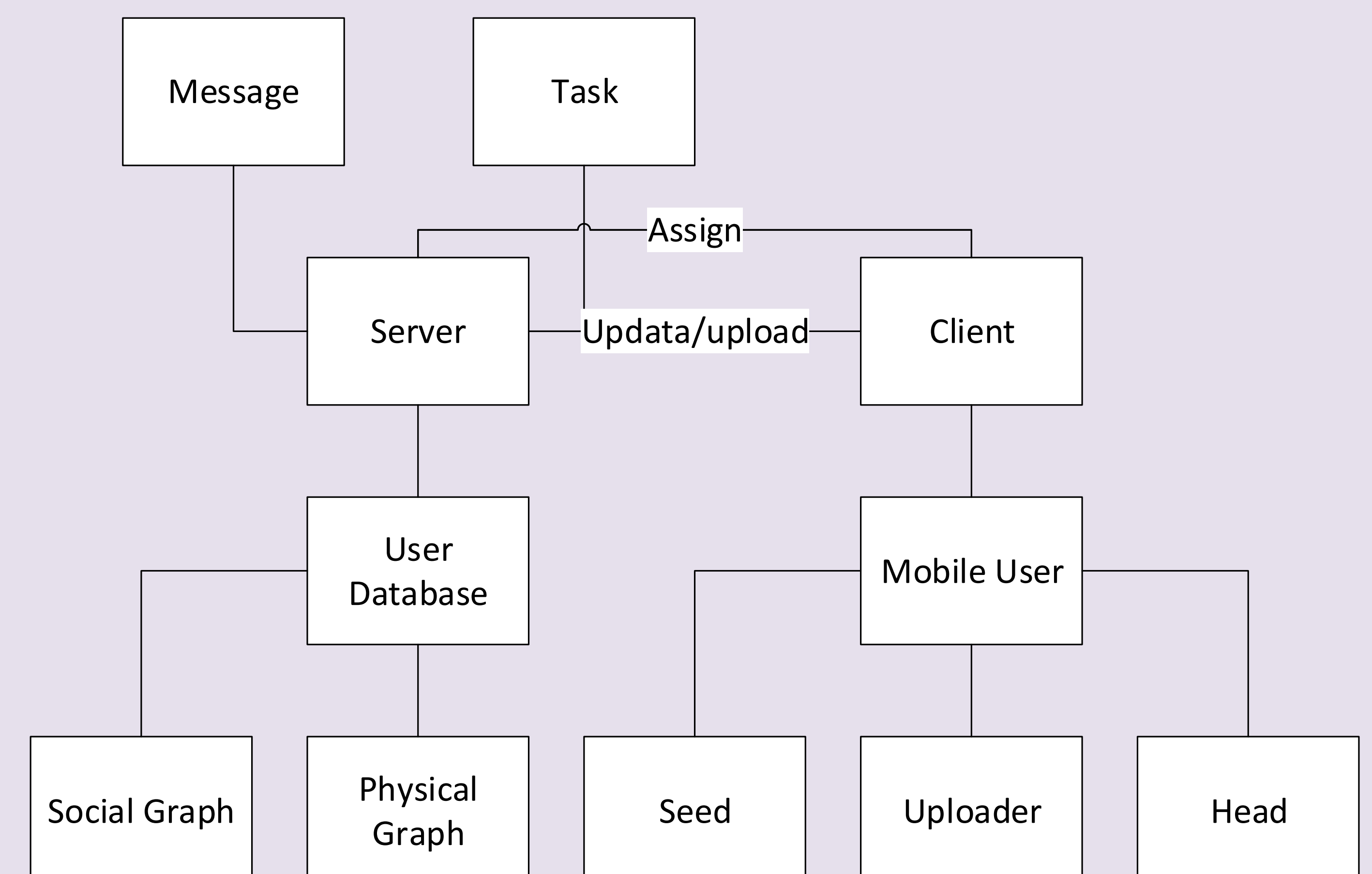
SOFTWARE ARCHITECTURE

Fig.2. Software Architecture

Fig. 2 shows how this system is implemented in real world. A typical MCS sever needs to allocate tasks and disseminate data to different mobile users based on user profiles. Besides that, the server needs to receive updates of user information and results of tasks. Communication among clients and sensing environment are also important. Mobile phone users need to accept and perform tasks that give them the highest benefit.

CONCLUSION

Compared with traditional sensor systems, MCS systems only need a small amount of cost in deployment and can provide various functions. In spite of those benefits, implementation of MCS meets many problems. Thus, it is meaningful to apply effective algorithms on these problems to build a real world system.