DMPS 2012 Workshop Summary

Data Management in Participatory Workshop

(\textit{Co-held with MDM 2012})

The proliferation of low-cost sensors in user devices such as mobile phones, tablets, and cars has inspired the idea of outsourcing sensing tasks to individuals who own these devices. This type of sensing is termed as participatory sensing. The realization of this concept would enable a number of interesting applications, which can be of great social and business value, such as early seismic detection, agile crisis response, personalized smog exposure and footprint, and health monitoring.

However, the utility of the sensory data is subject to uncontrolled mobility, as users move freely around, while data sensing and data transmission are costly, in terms of battery and bandwidth, respectively. Furthermore, privacy concerns are raised by the users, since the sensor data can be mined to determine details about an individual, such as their trajectories and history of activities. Hence, the realization of participatory sensing involves important data management research challenges, such as storage and processing of sensor data from uncontrolled mobile sources, data quality assessment, privacy-preserving data collection, data access control, and participation through incentives. The first workshop on data management in participatory sensing explored various challenges such as the ones summarized above.

The workshop consisted of invited talks and seminars from well-known researchers in participatory sensing. The first half of the workshop explored hot topics in participatory sensing covering data collection in an opportunistic manner and the issues involved in incentivizing participants (through a real deployment by IBM research). The highlights were on the incentives and energy challenges on the mobile devices. Big data mining in social media on data from Twitter was covered in the latter part of the first half. The second half of the workshop focused on tutorials, which covered privacy issues and possible solutions for participatory sensing, and building mathematical models for managing sensor data generated by a large community.

Finally, the workshop also engaged in an open discussion on the architecture for managing participatory sensor data and the open issues involved. The overall discussion pointed to a significant lack of a single unifying architecture for managing sensor data collected by this model, with the major issues that need to be addressed being energy on mobile devices, privacy in data sharing, modeling of the data collected, and mining the data from multiple sources for deriving useful and consumable information.

The workshop is set to take place during the next year at MDM 2013 and aims at addressing the challenges discussed at DMPS 2012.

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