Middleware for reliable high-performance mobile crowd sensing in large scale dynamic urban environments

Mots clés :
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- Unité de recherche : Centre d'Étude et de Recherche en Informatique et Communications
- Ecole doctorale : École Doctorale Informatique, Télécommunications, Électronique de Paris
- Domaine scientifique principal: Divers

Résumé du projet de recherche (Langue 1)
The emergence of the participatory sensing movement, also referred as the “Citizen Science” mobilizes large part of individuals to contribute in particular to the city operation and overall to make urban cities more sustainable. Involving smart phones equipped with sensors, users perform real-world tasks such as providing instant weather report, donating computational resources while the phone is idle, or capturing civic feedback and recommendation. In this context, the aim of the PhD lies in investigating social crowd sensing; a promising approach involves a trade-off between assuring the timeliness and reliability challenged by the dynamicity and large-scale coming from the mobile environment, and to successfully harness the willingness of citizens to contribute and in particular to produce a valuable feedback. The aim of this PhD is to develop algorithms and protocols for low-latency high-reliability communication enabling large scale participatory sensing in smart urban environments. The work during the thesis will include: - Study of the state of the art in mobile and distributed systems, with a view on performance and reliability vis à vis scale and dynamicity - Proposing a formal model of the underlying system, capturing the participants and their interactions - Based on the above models, designing distributed algorithms to address the challenges arising in such systems. These may be based on techniques such as bloom filters for compact representation of data, and stochastic techniques for handling scale and dynamicity inherent in such systems. - Validation and evaluation of the research, through implementation of a mobile middleware and experiments, both real-world and simulated. [1] Sara Hachem, Animesh Pathak, and Valerie Issarny. Service-Oriented middleware for large-scale mobile participatory sensing*. In: Pervasive and Mobile Computing (2013). [2] Francoise Sailhan and Mark Oliver Stehr. Folding and Unfolding Bloom filters: an off-line planning and on-line optimisation problem. In Proceedings of the IEEE Green Computing and Communications (GreenCom), 2012.

Résumé du projet de recherche (Langue 2)

Informations complémentaires (Langue 2)
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