

Ubiquitous sensing : services and applications

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Editorial

Ubiquitous Sensing: Services and Applications

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Ubiquitous sensing has penetrated into all aspects of our everyday lives and has gained tremendous research attention in recent years. This issue on ubiquitous sensing compiles 18 exciting manuscripts which are approved by reviewers.

There are four manuscripts studying routing algorithm in sensor networks, two manuscripts proposing data distribution methods, two manuscripts describing carpooling methods, three manuscripts studying energy saving in WSN, two manuscripts discussing localization in WSN, two manuscripts studying human action recognition, and three miscellaneous manuscripts.

C. Ma and N. Liu propose a routing algorithm in vehicular sensor networks based on some statistical data, like traffic density and vehicle distribution which is not considered in existing works. H. Gong and X. Wang propose a routing protocol in Mobile Social Networks based on selfishness of nodes which is more related to reality. X. Zhang et al. propose a routing algorithm in Vehicle Sensor Networks which solves a tracking problem. The tracking problem is that the destination vehicles will move continuously, so that when the data packets arrive at the original destination point, they are not able to be delivered. The algorithm uses area epidemic and parking vehicles assisted methods to track the destination vehicles to ensure the data delivery. Y. Feng et al. firstly analyze the predictabilities of different types of vehicles and then propose a new driving path predication based routing protocol (DPPR).

H. Zhao and J. Zhu propose a novel data distributing method in VANETs using roadside parking vehicles, and the parking vehicles are formed to several clusters which provide data caching and distributing services. H. Gong et al. present a Latency Estimation based data Delivery (LED) scheme.

According to the current location and the moving direction of the vehicles, LED calculates the expected delivery latency (EDL) of the individual vehicles and chooses the vehicle with the shortest EDL as the next hop to forward data.

J. Zhu et al. propose a parking-lot-assisted carpool over VANETs. It collects vehicle trajectories via accelerator sensor to sense vehicle's movement, establish a routing tree to deliver vehicle trajectory information to nearby parking lots, and design a suitable matching scheme to match the target vehicle in VANETs. N. Liu et al. present the idea of mobility crowdsourcing (MobiCrowd), which leverages private smartphone to collect individual trips for carpooling, without any explicit effort on the part of users. It acquires location information from smartphone, generates daily trips and mobility models for each user, and then makes carpooling zero effort by enabling travel data to be crowdsourced instead of tracking vehicles or asking users to input their trips. With prior mobility knowledge, one user's travel routes and positions can be predicted according to the current location, and then possible carpooling can be arranged to fit the mobility context.

J. Peng et al. present research on the existing clustering algorithm applied in heterogeneous sensor networks and then put forward an energy-efficient prediction clustering algorithm, which is adaptive to sensor networks with energy and objects being heterogeneous. This algorithm enables the nodes to select the cluster head according to factors such as energy and communication cost; thus the nodes with higher residual energy have higher probability to become a cluster head than those with lower residual energy, so that the network energy can be dissipated uniformly. O. Krejcar and R. Frischer present a modern and relatively cheap solution for powering some types of intelligent sensors in which

traditional battery power source is insufficient and other powering options are not applicable. Obtaining the energy to supply sensors is possible even from immediate sensors' environment. Sources (which are utilizing thermal gradient) are supplying energy from the surrounding environment and without the need for high intensity incident light (solar energy based). Y.-K. Kim et al. propose a novel Hilbert-curve based data aggregation scheme that enforces data privacy and data integrity for WSNs.

H. Wu et al. propose a method to make WSN localization suitable for the maritime search and rescue (MSR); an improved microelectromechanical systems (MEMS) aided algorithm on the basis of triangle and centroid algorithm is proposed to locate and track the search targets in real time and more precisely. Y. Lyu et al. propose a scalable location-sensing model based on RFID-sensing architecture for ephemeral social network (ESN) in consideration of four aspects of requirements, that is, the usability, QoS, scalability, and privacy. The model includes the perspectives of the privacy, architecture, deployment, and positioning algorithms, which can meet the four key requirements.

M. Kurz et al. study opportunistic activity recognition by enabling dynamic sensor configuration. In contrast to "traditional" applications where sensors, their modalities, locations, and working characteristics have to be defined at design time opportunistic systems do not rely on an initially defined and fixed sensing infrastructure. Sensors have to be utilized upon their spontaneous availability and activity recognition capabilities and dynamic sensor ensembles have to be configured at run-time with respect to maximized recognition accuracy and minimized energy consumption. M. H. Wang and P.-Y. Chen used palmprint with the extension method to design a low-cost personal recognition system.

X. Zhang et al. propose a novel traffic jam autoaware system which uses only sensors from mobile phones, and the mobile phones exchange information among each other in a crowdsourcing way and give traffic jam information to help drivers release anxiety for trapping in the traffic jam. B.-W. Jo et al. investigate the capability of wireless communication of sensor node embedded in reinforced concrete structure with a basic experiment on an electric wave permeability of sensor node by fabricating molding with variables of concrete thickness and steel bars that are mostly used in constructing structures to determine the feasibility of application to construct structures with ubiquitous sensor network (USN). M. Liu gives a survey of existing research works and applications on mobile phones.

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