Introduction to the Special Section on Urban Computing

Urbanization's rapid progress has modernized many people's lives, but also engendered big issues, such as traffic congestions, increased energy consumptions, and environmental pollutions. Urban computing aims to tackle these issues by using the data that has been generated in cities, e.g., traffic flow, human mobility and geographical data. Urban computing connects urban sensing, data management, data analytics, and service providing into a recurrent process for an unobtrusive and continuous improvement of people's lives, city operation systems, and the environment. Urban computing is an interdisciplinary field where computer sciences meet conventional city-related fields, like transportation, civil engineering, environment, economy, ecology, and sociology, in the context of urban spaces.

The objective of this special issue on Urban Computing is to bring together top-quality articles on the art and practice of urban computing to demonstrate and discuss its scopes, methodologies, applications, and potential research topics. We received 34 submissions from which 9 articles have been selected for publication after an extensive peer-review process.

The first article, entitled "Urban Computing: Concepts, Methodologies, and Applications" by Zheng et al., introduces the concept, general framework and key challenges of urban computing from the perspective of computer sciences. The article surveys the representative research in seven categories of applications. The typical technologies that are needed in urban computing are also proposed, with a few potential research topics suggested at the end.

The second article, entitled "Model-based count series clustering for Bike Sharing System usage mining, a case study with the Velib' system of Paris" by Come et al., presents a statistical model to automatically partition the stations in terms of their temporal dynamics over the day with respect to the number of rented and returned bikes. The results produced by such an approach give insights on the relationships between stations neighborhood type and the generated mobility patterns, inducing specific usage patterns in the Bike-Sharing-System data.

The third article, entitled "Mining User Check-in Behavior with a Random Walk for Urban Point-of-interest Recommendations" by Ying et al., proposes a location recommendation approach concerning a user's preferences and the properties of a location, using the check-in data from location-based social networks.

The fourth article, entitled "Using Digital Footprints for a City-scale Traffic Simulation" by McArdle et al., presents a micro-simulation of urban traffic flows within a large scale scenario implemented for the Greater Dublin region in Ireland, using the digital footprints of city inhabitants on services, like Twitter and Foursquare, rather than conventional methods, such as a population census and dedicated road surveys.

The fifth article, entitled "Charging and Storage Infrastructure Design for Electric Vehicles" by Momtazpour et al., present a framework to support placement of charging stations for an electrical vehicle deployment scenario, by modeling and analyzing networks of interactions between electric systems and urban populations.

The sixth article, entitled "Object-oriented Travel Package Recommendation" by Tan et al., offers tourists proper travel packages that is comprised of a set of selected landscapes, concerning additional contextual information, such as price, time, and route constraints. The proposed method was evaluated based on real travel package data sources.

The seventh article, entitled "Traffic Information Publication with Privacy Preservation" by Gurung et al., proposes a privacy-preserving algorithm for publishing spatial trajectories, which are widely generated when people use location-based services, such as an online navigation system.

The eighth article, entitled "Measuring and Recommending Time-Sensitive Routes from Location-based Data" by Hsieh et al., recommends time-sensitive routes, consisting of a sequence of locations with associated time stamps, based on knowledge extracted from large-scale time-stamped location sequence data (e.g. check-ins from Gowalla) and the user-specified source and the destination.

The ninth article, entitled "Check-ins in Blau space: Applying Blau's macro-sociological theory to foursquare check-ins from New York City" by Joseph et al., uses Latent Dirichlet Allocation to cluster Foursquare users in New York City into different types, e.g. tourists and athletics, using geo-spatial location, time, users' friends on social networking sites and venue function, etc.

We would like to acknowledge the authors of the submitted articles and the reviewers who actively collaborated in reaching the careful selection of articles in this special issue.

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