


- There are challenging issues for machine learning: how can new data types be added without having to completely re-learn the model (transfer learning). How can the large spatial and temporal scale issues (intersection to city-wide; seconds to years) be handled?
3. **Computable Liveability** Every year many organisations produce and publish 'Liveability' Indices for cities around the world. However, there is no agreed definition of liveability and therefore no way to compare indices produced by different organisations. Most measures rate Western cities highly. Why?
Is it possible to go from survey data to physical data? Does building a new hospital compensate for increasing traffic on the roads? Can we derive a personal liveability index based on measured data?

3.3 Towards Intelligent and Generic LBS for Drivers and Mobile Users

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In this talk I will focus on Location-Based Services (LBS) for hybrid networks composed of both vehicles and mobile users. The motivation is the interest of studying data management solutions that take into account a generic environment where different types of moving objects share different types of data and possibly using different communication technologies (ad hoc wireless communications forming a pure mobile P2P network, hybrid mobile P2P network with support infrastructure nodes, wide-area communications like 3G, etc.).

I will start by summarizing some data management challenges for vehicular networks, related to the exchange of events (efficient and effective content-based data dissemination for push-based data access), query processing (pull-based data access by using query dissemination or mobile agent technology), data item relevance evaluation, management of information about scarce resources (like available parking spaces or charge stations for electric vehicles), semantic data management, automatic knowledge extraction from the data items, multimedia data management, incentives, and trust. Then, I will show some use cases that exploit sensors embedded in moving objects to obtain interesting information (environment monitoring and multimedia data). Afterwards, I will emphasize the role that semantic technologies can play in this context and the benefits that they can provide as facilitators for the development of intelligent and generic LBS. Finally, I will present as an example the basics of our current prototype SHERLOCK (System for Heterogeneous mobile Requests by Leveraging Ontological and Contextual Knowledge), which exploits shared knowledge about different types of objects and services (encoded in ontologies) to offer interesting services and information to mobile users.

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3.4 Issues in Agent-based Route Choice Models

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Agent-based simulation forms one of the most prominent microscopic simulation paradigms. It is applied basically in all areas in which actors situated and interacting in an environment are to be modeled and analyzed. It is best characterized as “generative” simulation as the overall system properties and behavior are not merely described, but generated from lower level agent behavior and interaction. Agent-based simulation promises to solve many problematic issues of modeling in general, ranging from the possibility to formulate heterogeneity on various levels to integration of individual-level adaptation and population-level evolution that allows the simulation of self-organization and generative analysis of emergent phenomena.

Meanwhile, agent-based simulation plays an important role in traffic simulation: activity-based approaches for travel demand modeling as well as advance routing and mobility simulations (for a review see [1]). Modeling and simulation of route choice plays hereby a prominent role, as the problem can be mapped to gametheoretic scenarios such as the El-Farol Bar Problem or Minority Games. These scenarios can even be approached by experimentation for analyzing human decision making [2]: Classically, there are two options (to go to the bar or to stay at home, go on highway or country road, stay on route or change to alternative) between which each agent has to choose. The agents choosing the less