HiWi for the Project Cooperative Cars

The project “Cooperative Cars” (CoCar) is part of the aktiv research project and investigating the applicability of current mobile technologies, such as UMTS and its extensions, in Car–2–Car communication and corresponding applications. Car–2–Car communication enables cars to exchange information. For example, if a car is breaking hard in a critical situation, it warns following cars to avoid a collision. Furthermore, also other information derived from sensors in a car can be exchanged, e.g., that the road condition is bad. This communication can be enabled by different technological means. The most prominent ones are communication over wireless network technology (e.g., IEEE 802.11a/b/g, so called Vehicular Ad–hoc networks or VANETs), radio transmission and cellular networks.

It is desirable to derive useful traffic information from the data send out by the communicating cars. As the equipment rate of cars enabled with Car–2–Car communication will not be high in the near future, other sources have to be used to create valuable information, such as the current traffic state and a traffic state forecast. Therefore, data fusion is required to integrate data from the different traffic information sources.

These sources may comprise anonymous data from static mobile devices carried in vehicles (floating phone data), weather data or messages from the RDS/TMC system. We have developed a data fusion architecture for this scenario, integrating these data sources. Each of the sources can be viewed as a data stream, as data is continuously send by (or pulled from) each data source. Data Stream Management Systems are systems which can query a massive data flow without permanently storing data in contrast to database management systems. As these systems are well suited for efficient and timely processing and integration of data streams, a core component of the envisioned data fusion architecture will be a data stream management system.

You will support our team in the implementation and research on different parts of the architecture, for example the historicization of traffic data and the design and implementation of a validator component for traffic messages.

An applicant must have the following skills/knowledge:

- Java programming (experienced)
- Object–oriented design & programming, UML
- Relational databases + SQL (experienced)
- Literature search and scientific writing
- Data Streams (optional)

For further information, please contact:

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