Motivation

Autonomous driving is currently hailed as one of the silver bullets for future mobility scenarios. Yet, besides legal and security issues, the technological implementation is still problematic, especially in urban scenarios with dense traffic. Thoroughly assessing current sensor information to avoid possibly dangerous situations entails considerable effort, which in turn would be needed to derive best overall driving decisions. In brief, autonomously driving cars do not yet behave like experienced drivers, but still leave an awkward user experience by unexpected stops, frequent lane changes, etc.

Challenges & Highlights

Exploiting local data not only for a clear picture of a current situation, but also with respect to recent behavior of other drivers in the same location might alleviate this problem. There is a clear difference between the strategic intention (navigational task) and the tactics (guidance task) applied in a situation to achieve this intention. Selecting a correct and ‘natural’ guidance is a first important step; but then, it still needs to be stabilized with respect to the current situation. Of course, the sheer amount of data produced in everyday urban traffic needs strong big data analytics techniques coupled with state-of-the-art machine learning.

Potential applications & future issues

The assessment and selection of dominant (i.e., typical) driving tactics for different locations and situations promise more intuitive driving decisions in autonomous vehicles. Moreover, due to their data-driven nature, these tactics would not only reflect on locations and current situations but might also exhibit individual features, such as cultural differences or technical limitations of vehicles. Finally, improved predictions of guidance tasks and their relation to previous instances is bound to improve global planning for traffic and mobility services, too.

Project abstract:

Smart cities need data-driven concepts for effective and sustainable management of everyday tasks. A central task is to provide mobility in urban spaces with increasing population density. In tight cooperation with Volkswagen AG, the project Urban Mobility Assist investigates novel data-driven approaches to leverage locally measured data in vehicles and urban infrastructure to deliver added value at different levels for city management, commercial service providers, and individual users of mobility services.

Project duration:
31.12.2018

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Members:
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Project manager:
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Project research areas:
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