

# BMW Summer School 2015

## Connected Cars Driving on Digital Roads



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### Abstract

The next generation of vehicles is to be equipped with sensors to scan their surrounding environment and with radio technologies to connect both with the cloud and directly with other vehicles, smart devices and smart urban furniture in their proximity. Accordingly, connected vehicles become sources of a rich variety of traffic data that can consolidate and improve digital maps with dynamic information, turning them into digital roads. Compared to digital maps, digital roads provide a real time picture of the conditions of the road and all of its occupants, and are therefore critical to future smart mobility applications, such as driver assistance systems and autonomous driving applications, safety of vulnerable road users, and services for sharing economy or even electro-mobility. To enable such applications, further research is necessary in numerous domains like onboard electronics, telecommunications, and cloud computing, big data processing, as well as data security and privacy, human machine interaction, and prediction of the driver's state and behavior. Challenges also arise from the societal changes caused by smart mobility, as for instance the social acceptance and legal implications of providing or using digital roads, in particular the question of personal data collection and ownership.

BMW Research and Technology, EURECOM and Technische Universität München (TUM) jointly organize a summer school at lake Tegernsee, Bavaria, to bring together leading experts from both industry and academia, as well as PhD students and junior scientists, and jointly discuss and work on key challenges ahead of us for expected societal, economic and technological changes on the topic of "connected vehicles driving on digital roads".

### Solicited Topics

BMW Research and Technology, EURECOM and TUM solicit high quality and highly innovative posters (not full papers) from PhD candidates in the following categories:

- Vehicular cloud & fog architectures, services and computing
- Human Machine Interfaces & Scalable on-board electronics
- Dependable communication technologies (such as DSRC, LTE/LTE-A, pulse radio, visible light)
- Vehicular networking paradigms, such as Software Defined Networks, Content-centric Networks, Network Virtualization, Machine-to-Machine
- Geographic Information Systems (GIS), positioning and localization
- Semantic Web-of-Things, e.g. data semantics, data fusion, classification & re-construction
- Sensor and actuator integration, environmental perception & vehicular control
- Cognition and driver behavior
- Security and privacy in on-board and off-board applications and communication links.
- Business and societal changes, new innovative applications based on autonomous vehicles
- Legal framework and socio-economic acceptance

Your submission will be peer-reviewed to assess qualification and relevance for the Summer School. Full applications also require a CV, a letter of motivation, masters degree certificate and a brief description of your PhD topic. A list of references is also highly appreciated. Travel support will be awarded by BMW for selected applications. Students with accepted posters will have the opportunity to present their work in front of leading experts from industry and academia.

### Date, Venue & Summer School Format

Hotel Terrassenhof, Lake Tegernsee, Bavaria, Germany, July 6<sup>th</sup> – July 11<sup>th</sup> 2015.

The Summer School format comprises keynote presentations from executive-level speakers, ideation workshops, technical expert presentations from industry and academia, moderated panel discussions and PhD poster presentations. During moderated PhD challenge group discussions and idea creation workshops, innovative visions and applications, conceptual, sociological and business changes shall be discussed that are to be expected with the rise of fully-connected vehicles in the Internet of Things. The Summer School is complemented by social events in the beautiful area of Lake Tegernsee. One of the highlights of this year's event will be a full ideation process, during which the participants can elaborate their ideas towards full business plans with the possibility to get in touch with startup accelerators. Awards for the best PhD posters and outstanding proposals from idea creation workshops or challenge group discussions will be presented during the closing ceremony.

### Contact

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