Keynote Speech by Dr. Galia Weidl

Abstract EUROSIM 2016

Part 1:

Autonomous Driving and Levels of Automation

The first part of the keynote speech will provide an overview on the topic “Autonomous Driving and Levels of Automation”, while addressing a number of questions:

- Why do we need Automated/Autonomous Cars?
- What are the development directions for Autonomous Vehicle‘s Functions?
- Automation Levels and Legal Regulations.
- Task Sharing between Human and Vehicle at different Automation Levels?
- What does the Driver, what does the System?
- What about the challenge of Safety and Automation. Collision Mitigation by the System is Obligation!
- Does one still need a Driver on City- and Overland Roads?
- Automated Driving in Country- and City Traffic: the Vehicle’s Platform, Sensors, Digital Map, Software. What are the challenges and their solutions?

The following topics will be shortly highlighted: Positioning, Localization, Recognition of Obstacles, Intersections and Roundabouts, Recognition of static and dynamic objects, Stereo Vision, Environment Perception, Traffic Light Recognition, Maneuver planning, Object classification and Behavior Prediction, Trajectory Planning.

The presentation will include a number of video impressions to demonstrate autonomous driving in real traffic.

Part 2:

Situation Awareness and Early Recognition of Traffic Maneuvers

Abstract (Dissemination of Results from Work Package "Maneuver recognition in highway traffic", EU Project AMIDST: www.amidst.eu)

Why are situational awareness and early recognition of traffic maneuvers essential elements of modern driver assistance and of autonomous driving systems?
What type of modelling and implementation can meet all automotive requirements on early maneuver recognition, almost perfect accuracy and fast computation under severe memory

restrictions, i.e., how to effectively resolve the deployment issues in a prototype car and ensure robust performance in real highway traffic?

We outline the challenges of situation assessment with early and accurate recognition of traffic maneuvers and how to address them. This includes also an overview of the available data and derived situation features, handling of data uncertainties, modelling and the approach for maneuver recognition as a combination of methods and their concrete implementation are briefly explained. An efficient and effective solution, meeting the automotive requirements, is successfully deployed and tested on a prototype car. Test driving results show that earlier maneuver recognition is feasible on average 1 second (and up to 4.86 s) before the actual lane marking crossing. Even earlier maneuver recognition is dependent on the earlier recognition of surrounding vehicles. Trend analysis of the maneuver probability ensures even earlier maneuver recognition.

The presentation will include a number of videos illustrating the solution to maneuver recognition in real traffic.

Brief Bio

Galia Weidl has obtained her MSc. (Hons.) degree in physics and mathematics from the St. Petersburg State University, Russia, in 1993, Fil.Lic. degree in theoretical physics from the Stockholm University, Sweden, in 1996, and a Tekn.Dr. doctoral degree in process engineering from Mälardalen University, Sweden in 2002. Until 2006 she has been a postdoc at Stuttgart University, Germany. She was with the Research teams of ABB Sweden (1997-2002), Stuttgart University (2003-2006), Bosch (2006-2008) and Daimler (since 2008). She has co-authored a number of articles and patents and has been invited to give talks and innovation workshops.

Her current research topic is Bayesian networks in the area of autonomous driving. Dr.Weidl is a principal scientist at Daimler AG and a project leader of work package "Maneuver recognition in highway traffic" in an EU project AMIDST. She is Daimler's responsible in the consortium and in the General Assembly.

Galia Weidl was appointed in 6/2015 by the European Commission as invited independent expert in evaluating project proposals for Horizon2020.

She acts as an invited reviewer of scientific articles for journals and international conferences.