

Plenary Talk

“Steps Towards Full Automation of Road Vehicles”

Prof. Alberto Broggi
Università di Parma, Italy

Abstract:

The number of cars equipped with active ADAS is increasing on a regular basis. Systems like Lane Keeping, ACC, Parking Aid are becoming more and more common on high-end automobiles. These systems are meant to help the driver in specific situations during the driving task; usually they feature either longitudinal or lateral automatic control, but special care is taken to avoid completely automatic driving for long periods of time so that the driver is not taken out of the driving loop.

Anyway, assuming that vehicles in the far future will be completely autonomous, some intermediate steps are mandatory, which are based on automating specific driving tasks in well-defined scenarios, such as -for example- highway driving. As a consequence, the driver and the vehicle itself will have to share vehicle control in a cooperative way. Indeed it will be highly probable that sometimes the driver's and the vehicle's intentions differ, creating a sort of conflict: a skilled driver might want to override vehicle's automation, while the vehicle's electronic pilot might want to help an incapable driver by taking control over him/her. The talk will propose a possible solution to this arbitration issue and will present some of VisLab's prototype vehicles, such as BRAiVE (www.braive.vislab.it), specifically designed to tackle these issues and demonstrate how high levels of automation might be integrated in future intelligent vehicles.

The talk will also present VisLab's latest challenge in the field of completely autonomous driving: VIAC (the VisLab Intercontinental Autonomous Challenge, www.IntercontinentalChallenge.eu) an intercontinental trip from Italy to China autonomously driven for the first time in history by a set of unmanned vehicles.

Short Bio:

Alberto Broggi is full professor of Computer Engineering at the University of Parma, Italy. He is the founder and director of VisLab, the Artificial Vision and Intelligent Systems Lab at the University of Parma, and CEO of VisLab srl, a spinoff company of the same University.

He has been pioneering the field of intelligent vehicles since its early days, gathering field experience together with industrial partners.

Some of VisLab's results are commonly considered worldwide milestones in the field of vehicular sensing and robotics, such as the ARGO and the TerraMax autonomous vehicles. His main research interest is on sensing technologies applied to the vehicular environment for different kinds of vehicles including cars, trucks, on-road, off-road, mining, road construction, military, and maritime vehicles.

Alberto Broggi served as Editor-in-Chief of the IEEE Transactions on Intelligent Transportation Systems for the term 2004-2008 and serves as President of the IEEE Intelligent Transportation Systems Society for the term 2010-2011. He has been the Editor on the subject of ITS for the IEEE Intelligent Systems Magazine since 1999 and founder of the IEEE ITSC Newsletter.

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c/o Giovanni Indiveri, Dipartimento Ingegneria Innovazione
Università del Salento, via Monteroni, 73100 Lecce, Italy
Phone +39 0832 297220 - Fax +39 0832 297733
iav2010@unile.it