

Duration: 08:30 - 12:30

Room: Oslo

SW-01

Modulation Schemes and Interference of Automotive Radars

Organisers:

Christian Waldschmidt, Ulm University, Germany

Thomas Zwick, Karlsruhe Institute of Technology, Germany

Abstract

In recent years automotive radar research came into the focus of many researchers as well as industry worldwide. While the number of sold units dramatically increased in the last ten years the integration level of automotive radar devices was increased together with the complexity in hardware and software. It can be expected that in the next generation of automotive radars more complex modulation schemes will be implemented. At the same time, interferences between radars will become a very important effect to be considered due to the vastly increasing market penetration rate of the systems on our roads. The short course starts with an introduction to the most promising candidates for future automotive radar modulation schemes: chirp sequence, OFDM (orthogonal frequency division multiplexing), and PN (pseudo-noise). Thereby the interference mechanisms will be explained as well. Afterwards, an overview of current investigations on the occurrence and the effects of interference on automotive radar functions is given. Recent approaches for interference mitigation are presented and discussed.

Programme

08:30 - 08:50 Chirp-Sequence Radar - Functionality, Resolution, and Ambiguity

Fabian Roos, Christian Waldschmidt, Ulm University, Germany

08:50 - 09:30 OFDM for Automotive Radar Applications

Benjamin Nuß, Thomas Zwick, Karlsruhe Institute of Technology, Germany

09:30 - 10:10 Mutual Interference Analysis of PMCW and FMCW Radars

Wim van Thillo, IMEC, The Netherlands

10:10 - 10:50 Break

10:50 - 11:20 Mutual and Incumbent Frequency User Interference Thread for Automotive Radar Systems – A General Overview and Useful Mitigation Techniques

Martin Kunert, Robert Bosch GmbH, Germany

11:20 - 11:40 Automotive Radar Interference Scenario Simulations

Mario Pauli, Thomas Zwick, Karlsruhe Institute of Technology, Germany

11:40 - 12:30 Interference Mitigation in Time, Frequency and Angular Domain

Jonathan Bechter, Christian Waldschmidt, Ulm University, Germany