Call for Papers

IEEE Journal of Selected Topics in Signal Processing

Special Issue on Recent Advances in Automotive Radar Signal Processing

We witness today an enormous amount of activities in the automotive industry, in particular the development of Advanced Driver Assistance Systems, with the goal to make driving safer and more comfortable. Moreover, the introduction of the Highly Automated Driving is considered a topical technology challenge. The performance and reliability of these systems strongly depends on the capabilities of the environmental sensing, for which radar technology is considered as indispensable.

Advantages of radar technologies when compared with LiDAR and camera technologies clearly are the robust and preferred operation in adverse weather conditions, higher range, direct measurement of relative velocity, and affordability. An active field of research and development is to mitigate limitations of automotive radar, which are mainly angular resolution and object classification capabilities. For instance, high-performance radar sensors can be developed using MIMO radar techniques and a plurality of highly integrated radio frequency components. Another trend is to exploit specific data features, e.g. micro-Doppler signatures, to improve the detection and classification of vulnerable road users. In particular, machine learning and deep learning applications are increasingly used.

This special issue targets novel technical contributions. Topics of interest include, but are not limited to:

- MIMO radar
- 4D imaging radar
- Model-based high-resolution parameter estimation
- Online methods for calibration, performance monitoring and fault detection
- Interference detection and mitigation
- Enhanced object and scene classification
- Machine learning and deep learning applications (point cloud segmentation, occupancy grid calculation, 3D object detection)
- Hardware acceleration and integration
- Radar and communications
- Radar networks
- Data fusion and target tracking
- Prototyping, measurements and experimentation

Guest editors:

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Milestone dates:

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Revised manuscript due: 04-Jan-2021
Second review completed: 15-Feb-2021
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