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IEEE Transactions on Aerospace and Electronic Systems

Special Section on Automotive Imaging and Super-Resolution Radar Systems

Scope and Aims

The automotive sensing suit typically includes radars that are robust to adverse weather conditions, insensitive to lighting conditions, provide long and accurate range measurements, and can be packaged behind optically nontransparent fascia. Currently, automotive radar performance is the main enabler for advanced active safety and autonomous driving capabilities. Automotive radars for consumer autonomous vehicles need to further enhance radar capabilities mainly in terms of performance *robustness* and *super-high, image-like angular resolution*. At the same time, consumer automotive radars must provide attractive cost structure, be mass producible without involving exotic materials and manufacturing processes. These requirements further motivate research to extend the imaging capabilities of the current state-of-the-art automotive radars. Automotive radars can be seen as the first massive civil and consumer application, which drives its unique challenges associated with high reliability and low false alarm needs. This Special Section seeks to attract **breakthrough research on non-trivial high-resolution imaging techniques, and automotive radar detection capabilities**.

Topics of Interest include (but not limited to):

- ❖ High-resolution imaging capabilities enabled by cognitive radar processing
- ❖ High-resolution parameter estimation enabling imaging radar performance in dense urban environment characterised by multiple closely spaced objects
- ❖ Machine and deep learning techniques to address radar imaging and robust target detection challenges considering practical computational complexity constraints
- ❖ Radar-vision fusion to enhance radar performance beyond conventional sensor fusion
- ❖ Joint radar and communications systems to enhance radar sensing by communications
- ❖ Mobile radar networks
- ❖ Robust detection and localization of distributed radar targets characterised by multiple reflections and point cloud
- ❖ Automotive radars assisted with intelligent reconfigurable surfaces to enhance operation robustness in dense urban scenarios
- ❖ Sub-THz radar imaging to address automotive radar high angular resolution and small form factor requirements
- ❖ Automotive radar architectures (centralized vs. distributed and cloud computing)

Important Dates:

Submission window: Oct. 1 – Nov. 1, 2022
Revised manuscript due: March. 15, 2023
Final manuscript due: June 30, 2023

First review completed: Feb. 1, 2023
Second review completed: May 30, 2023
Publication date: 3rd quarter of 2023

Submissions will be reviewed according to standard T-AES procedures for regular papers. Prospective authors should visit <http://mc.manuscriptcentral.com/taes> for submission information. Use the category Special Section: Automotive Radar Systems and Applications.

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