

# ISIF-SPONSORED EVENTS AND WORKSHOPS

## IMPRESSIONS OF THE 13TH IEEE AESS SYMPOSIUM “SENSOR DATA FUSION—TRENDS, SOLUTIONS, AND APPLICATIONS” (SDF 2019), OCTOBER 15–17, 2019, BONN, GERMANY

Initiated and organized by the Fraunhofer FKIE and with active participation of the international expert community, as well as sponsorship from the International Society of Information Fusion (ISIF), the 13th Symposium *Sensor Data Fusion: Trends, Solutions, and Applications* took place from October 15–17, 2019 at the Uniclub Bonn. Participants from industry, universities, and research institutes from overseas and Europe presented and discussed current developments in modeling, applications for data fusion, as well as theoretical findings.

Sensor data fusion and state estimation at the end of the second decade in this century was clearly influenced by *deep*

*learning* and *artificial intelligence*. Its impact on data science, engineering, and even ethics and philosophy was immense, and the field of *information fusion*, as part of it, got some impulses for new applications, new methods, and better results. This was reflected in Sensor Data Fusion (SDF) 2019 with its 22 presentations in seven sessions, where the trend of hybrid methods that combine model-based tracking with deep learning approaches for classification, big data processing, anomaly detection, and intention prediction continued. In particular, a strong presence of automotive applications could be observed, which have a large variety in the challenges addressed: from novel methods for extended target tracking to

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Keynote speech from Prof. Fredrik Gustafsson: “Fusion Theory for Positive Noise”.

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The coffee breaks were well received for continued discussions and networking.

robust navigation, multisensor fusion, and image segmentation with uncertainties.

Traditionally, the invited Plenary Talk was a special highlight of the conference. This year it was held by Prof. Fredrik Gustafsson, Linköping University of Technology, Sweden, one of the internationally leading protagonists in sensor informatics. He spoke on “Fusion Theory for Positive Noise”. Positive noise arises, for instance, in localization problems based on time differences when multipath propagation is present. However, it has not gained much attention until now. Prof. Gustafsson presented multiple approaches to model positive noise and di-

rectly gave their optimal estimators to the audience. This sound technical approach with applications to real problems was well received by the participants of the symposium.

The high quality of the numerous submissions to SDF 2019 made it difficult to honor two particular papers with an award, which come with a 100€ book voucher for a popular online store. This time, the committee rewarded novel and exceptional consistent approaches to combine machine learning with statistical model based fusion: The Best Paper Award went to Mahed Javed and Lyudmila Mihaylova for their paper “Leveraging Uncertainty in Adversarial Learning to Improve Deep Learning Based Segmentation”, and the Best Student Paper Award was received by Florian Particke, Jiaren Zhou, Markus Hiller, Christian Hofmann, and Jörn Thielecke for “Neural Network Aided Potential Field Approach for Pedestrian Prediction”.

SDF 2019 was jointly organized by Wolfgang Koch, Fraunhofer FKIE/University of Bonn and Peter Willett, University of Connecticut, acting as Executive Cochairs. Technical Program Chair was Felix Govaers, Fraunhofer FKIE. There were about 60 participants with a diverse mixture of interested people from industry, academia, and research institutes. The audience was international (SWE, UK, AUS, USA, for instance) but the majority is from Germany due to the local attraction. The audience stays in a single group, which often results in interesting and feisty discussions. We will continue our series irregularly in 2021 with the upcoming SDF Symposium and hope to see many of our participants at the FUSION 2021 conference next year in South Africa.

More information on this and future SDF workshops can be found at <http://fkie.fraunhofer.de/sdf2019>.



Best Paper Award and Best Student Paper Award for Mahed Javed et al. and Florian Particke et al., respectively.