SDF 2022 Report

IMPRESSIONS OF THE 14TH IEEE AESS SYMPOSIUM "SENSOR DATA FUSION – TRENDS, SOLUTIONS, APPLICATIONS" (SDF 2022)

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After a break of two years due to COVID-19, the 14th IEEE AESS Symposium *Sensor Data Fusion: Trends, Solutions, and Applications* took place from October 12–14, 2022 in Bonn, Germany. It was organized by the Department of Sensor Data and Information Fusion at Fraunhofer FKIE, with active participation of the international expert community, technical sponsorship from IEEE AESS and financial sponsorship from ISIF and industry partners IBM Defence Germany, Diehl Defence BGT, Spherea, Hensoldt, and Schönhofer SSE. The ISIF sponsorship made it possible to have the conference happen in the wonderful Uniclub Bonn.

The SDF Symposium continued the tradition of a single-track conference style at the location Uniclub Bonn, which is located next to the Rhine River in the center of the city. The number of participants (60) was slightly above the average of the past years. It was great to meet friends, colleagues and related researchers again; the participants enjoyed the in-person discussions after the involuntary break during the pandemic.

Participants from industry, universities, and research institutes from overseas and Europe presented and discussed current developments in modeling and applications of data fusion for intelligent systems as well as theoretical findings. The 24 presentations were grouped into seven sessions, because in 2022 the trend of the past years with increasing applications of machine learning for data fusion could not be observed. The session on deep learning-based methods consisted of four presentations mostly on classification tasks. For instance, Warre Geeroms et al. (University of Ghent) identified speakers based on fusion concept to combine audio streams with facial features detected in a synchronized video, whereas Jingxuan Su et al. (University of Sheffield) presented an approach to improve imbalanced data for semantic image segmentation. The audience could listen to and discuss model-based approaches from eight contributions on estimation theory and target tracking as well as from eight presentations on navigation and localization. Selected talks were, for instance, the presentation of Audun Hem et al. (Norwegian University) on a smart compensation on radar rotations within the framework of the Joint Integrated Probabilistic Data Association (JIPDA) and the presentation of Sutthiphong "Spot" Srigrarom (National University of Singapore) on a track-to-track association approach for person re-identification in multi-camera applications based on geometrical considerations of the convex hull topology.

Wolfgang Koch opening the SDF 2022 Symposium.

Simon Maskell during his keynote speech on large scale density sampling.

A highlight of the symposium was the keynote on "Towards Using Large-Scale Sequential Monte Carlo to Get Big Information out of Small Data" given by Simon Maskell, where he presented innovative approaches for using recent computer technology on sampling from target distributions in large data sets by parallelizing Monte Carlo methods. In 2022, the SDF Symposium introduced the novelty of an Industry Talk, which in this case was given by Martin Kugelmann from Spherea. In his talk entitled "What is Common to a Drilling Machine, a Medium-sized Company, a Research Institute and Music?" he moved along a proverbial path from innovation for technology, which enhances our daily life, to the sounds of music, which connects humanity by a common ground of sensing, feeling, and enjoying. His talk was the perfect transition to the piano recital which was given afterwards as an opening event for the conference gala dinner. The pianist Julia Rinderle[1] introduced the composers of the evening which were Beethoven (born in Bonn), Schumann (died in Bonn), and Chopin (might have come through Bonn on his way from Poland to Paris). Despite the technical background of her audience, the feedback we received was enthusiastic. Data fusion and classical music definitely are a match.

All publications from SDF 2022 can be found in IEEE Xplore. The upcoming SDF 2023, to be held again in Bonn, November 27–29, will be a joint event with the IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI).[1]

[1] https://juliarinderle.de/