

SDF | 2026

18th Symposium

Sensor Data Fusion: Trends, Solutions, and Applications

Technical Program

23–25 November 2026 | Bonn, Germany

Location: Universitätsclub Bonn e.V., Konviktstr. 9, 53113 Bonn, Germany
Executive Chairs: Wolfgang Koch (Fraunhofer FKIE and University of Bonn); Felix Govaers (Fraunhofer FKIE)
Information: `www.fkie.fraunhofer.de/sdf2026`

Welcome

The 18th Symposium on Sensor Data Fusion brings together researchers and practitioners working on sensor data fusion, estimation, target tracking, machine learning, localization, and applications. The technical program contains 32 accepted paper presentations in 11 topical sessions. Each regular paper is allocated 30 minutes including discussion. Session chairs and selected social programme details may still be updated.



At a glance

Monday	Technical sessions; Icebreaker reception (Sion im Carré, approximately 19:00).
Tuesday	09:00–10:30 plenary keynote by Lyudmila Mihaylova; technical sessions; piano recital with Julia Rinderle and gala dinner.
Wednesday	Technical sessions and symposium closing.



Monday — 23 November 2026

08:45–09:00 **Welcome & Opening — Wolfgang Koch and Felix Govaers**

Session 1: *Multi-Object & Extended Object Tracking*

Chair: Florian Pfaff

09:00–09:30 **Hoher, Patrick; Homburger, Hannes; Reuter, Johannes***
Extended Object Tracking based on Virtual Measurement Models and Gauss-Newton accelerated MPPI

09:30–10:00 **Bavelaar, Koen*; Arnaiz Burgueño, Roberto; Driessen, Hans**
The Mixed Ornstein-Uhlenbeck Model in Target Tracking for Mean-Reverting Motion and Weaving Motion

10:00–10:30 **Krejčí, Jan*; Straka, Ondřej**
Beyond Random Finite Sets in Multi-Object Tracking: Infinite Clutter and Lifetimes

10:30–11:00 **Coffee break**

Session 2: *Radar Resource Management & Sensor Scheduling*

Chair: Wolfgang Koch

11:00–11:30 **Jaspers, Joost*; Chioccarello, Stefano; Driessen, Hans**
Bayes Risk-Based Radar Resource Management for Joint Track Maintenance and Classification

11:30–12:00 **Chioccarello, Stefano*; Driessen, Hans; Yarovoy, Alexander**
Bayes Risk-Based Radar Resource Management for Search Tasks

12:00–12:30 **Szwalek, Alicja*; Liu, Xingchi; Hunter, Alasdair; Mihaylova, Lyudmila**
Bayesian Optimisation for Sensor Scheduling and Target Tracking using Multi-task Gaussian Process

12:30–13:30 **Lunch break**

Session 3: *Navigation, Estimation Bounds & Integrity*

Chair: Daniel Frisch

13:30–14:00 **Turovska, Anastasiia***
Iridium STL as an Independent Integrity Verification Channel for ML-Enhanced ARAIM in Civil Aviation

14:00–14:30 **Mikus, Philipp***
Accuracy Limits in Joint Platform Trajectory and Landmark Estimation from Range Measurements



14:30–15:00 **de Moura Magalhães, Giorgio***
Intrinsic Fisher Information and Curvature-Dependent Cramér-Rao Bounds for Multistatic Orbit Estimation

15:00–15:30 Coffee break

Session 4: *Learning-Based Tracking & Data Association*
Chair: Hosam Alqaderi

15:30–16:00 **Scheible, Alexander*; Buchholz, Michael**
Differentiable Labeled Multi-Bernoulli Filtering for Unsupervised Filter Model Learning in Multi-Object Tracking

16:00–16:30 **Brückner, Jan***
Accumulated State Density Methods for Asynchronous, Bearing-Dominated Track-to-Track Association and Resampling

16:30–17:00 Break / transition to industry talk

17:00–17:30 Axon Industry Talk — Multi-Sensor Data Fusion for Low-Altitude Airspace Security: Lessons from the Field. (Speaker: Hosam Alqaderi (Axon))

18:00–19:00 Guided Tour - Bonn — by and with Wolfgang Koch (Start: Uniclub)

19:00 Icebreaker reception — Sion im Carré (In der Sürst 1, Bonn. approx.)



Tuesday — 24 November 2026

09:00–10:30 Plenary talk — Lyudmila Mihaylova — Machine Learning Methods for Trustworthy Autonomous Systems with Uncertainty Quantification

10:30–11:00 Coffee break

Session 5: *Camera, Radar & Heterogeneous Sensor Fusion*
Chair: Michael Hubner

11:00–11:30 **Agrawal, Shiva*; Bhanderi, Savankumar; Elger, Gordon**
Resource-Efficient 3D Shape and Orientation Estimation of Road Users using Roadside RGB Camera and 3D Radar

11:30–12:00 **Söyünmez, Sidal; Duraisamy, Bharanidhar; Mayank, Mayank; Muntzinger, Antje***
Sequential Camera–LiDAR–Radar BEV Fusion: Effects of Fusion Order and Attention Design

12:00–12:30 **Chen, Guofei*; Chen, Xiaojun; Xia, Yuxuan; Lin, Longlong; Ting, Yuan**
VAET: Visibility-Aware Extent Transformer for Reliability-Aware Heterogeneous Sensor Fusion

12:30–13:30 Lunch break

Session 6: *Probabilistic Inference & Model Confidence*
Chair: Martin Ulmke

13:30–14:00 **Winheim, Leon*; Walker, Markus; Hanebeck, Uwe**
Stick-Breaking Bayesian Mixture Density Networks for Multi-Modal Probabilistic Regression

14:00–14:30 **Hillitzer, Florian*; Buchholz, Michael**
Hierarchical Subjective-Logic Self-Assessment for Multi-Sensor Kalman Filtering

14:30–15:00 **Hoffmann, Luisa*; Darijani, Ali; Beyerer, Jürgen; Heizmann, Michael**
Gaussian Mixture Belief Propagation for Hybrid Inference in Factor Graphs

15:00–15:30 Coffee break

Session 7: *Autonomous Systems & Human-Centric Fusion*
Chair: Florian Gagel

15:30–16:00 **Raj, Rijul; Aprem, Anup*; George, Ambily; Mohamed , Anuj**
CMSF-Net: A Causal Mamba Sensor Fusion Network for Robust Vehicle Localization



16:00–16:30	**Gaurav, Ashish*; Wartke, Konrad; Khosla, Praveen ; Kumar, Satish ; Ramesh, Visvanathan; Stork, Wilhelm** *Hierarchical Light-weight Multi-view Fusion of Distributed UWB Sensors for Privacy-Preserving Human Activity Recognition*
16:30–17:00	**Duraisamy, Bharanidhar*; Gruetzmacher, Moritz; Haag, Stefan; Gründler, Carolin** *Human Feedback Enabled Bayesian Fusion for Multi-Modal Automatic Data Annotation for Autonomous Driving*

17:30–18:30 Piano recital — Julia Rinderle

18:30 Gala Dinner



Wednesday — 25 November 2026

Session 8: *Collaborative Fusion & System Architectures*
Chair: Bharanidhar Duraisamy

09:00–09:30 **Hubner, Michael*; Wohlleben, Kilian; Nausner, Jan; Pöschl, Julia**
MuFASA - A Domain-Independent Framework for Rapid Prototyping of Multimodal Sensor Fusion Systems

09:30–10:00 **Gehlen, Joshua*; Brötje, Martina; Logiewa, Robert**
SISI-FUS: A Cloud-Native Architecture Concept for Scalable Sensor and Information Fusion

10:00–10:30 **Bourguignon, Anaïs*; Al Hage, Joelle; Bonnifait, Philippe**
On the Accuracy and Uncertainty of factor graph Optimization with Consensus-ADMM for Collaborative SLAM

10:30–11:00 Coffee break

Session 9: *Advanced Bayesian Estimation & Filtering*
Chair: Martin Herrmann

11:00–11:30 **Huynh, Martin Quoc-Tuan Buu*; Lopez, Michael Ernesto; Klund, Aleksander; Baerveldt, Martin; Stahl, Annette; Brekke, Edmund**
Extended Object Tracking using a PCA Fourier Extent Representation and Posterior Linearization

11:30–12:00 **Pfaff, Florian***
Fixed-Interval Smoothing with the Fourier-Interpreted Grid Filter

12:00–12:30 **Darijani, Ali*; Stratmann, Benedikt; Hanebeck, Uwe D.; Bahadur Thapa, Ratan; Beyerer, Jürgen; Afifi, Nehal**
Closed-Form Gaussian Mixture Representations of d-Dimensional Triangulated Domains

12:30–13:30 Lunch break

Session 10: *Density Approximation & Efficient Prediction*
Chair: Jan Krejčí

13:30–14:00 **Frese, Udo*; Hasselbring, Arne**
Compact Sigma-Points via Low-Entry Matrix Square Roots

14:00–14:30 **Gehlen, Joshua*; Frisch, Daniel; Govaers, Felix; Hanebeck, Uwe; Koch, Wolfgang**
On Constructing a Low-Rank Approximation of a Density



14:30–15:00 **Frisch, Daniel*; Gehlen, Joshua; Hanebeck, Uwe D.**
Learning Low-Rank Tensor Representations of Transition Densities for Prediction

15:00–15:30 **Coffee break**

Session 11: *Fusion Applications, Optimization & Tools*
Chair: Joshua Gehlen

15:30–16:00 **Qiu, Tian*; Kumar, Rohit; Chinnapalli, Sai Prashanth**
A Multi-Device, Multi-Modal, Convolution-Augmented Transformer-Based Model for User Localization

16:00–16:30 **Govaers, Felix*; Ulmke, Martin; Gagel, Florian**
A Direct Quadratic Approximation of the Weapon Target Assignment Problem for Quantum Annealing Optimization

16:30–17:00 **Darijani, Ali*; Stratmann, Benedikt; Pigem, Genis Floriach; Beyerer, Jürgen; Hoffmann, Luisa; Heizmann, Michael**
GMTorch: Computing with Gaussian Mixture Uncertainty in PyTorch

17:00 **End of SDF Symposium 2026**