

**Sunday**  
7 July 2024

Registration opens at 8am

**Bootcamp**  
[08:30-10:45]

**ISBA-FUSION  
workshop**  
[09:30-10:45]

Coffee Break

**ISBA-FUSION  
workshop** **Bootcamp**  
[11:15-13:15]  
[11:15-12:45]

Break

**Bootcamp** **OSTEWG  
Meeting**  
[14:45-16:45]  
[14:45-16:45]  
*Invitation only*

Coffee Break

**Bootcamp** **OSTEWG  
Meeting**  
[17:15-18:15]  
[17:15-18:15]  
*Invitation only*

**Monday**  
8 July 2024

Registration opens at 8am

**Tutorials'  
Early Morning  
Sessions** **ETURWG  
Meeting**  
*Invitation only*  
[09:00-10:30]

Coffee Break

**Tutorials'  
Late Morning  
Sessions** **ETURWG  
Meeting**  
*Invitation only*  
[11:00-12:30]

*Lunch for ETURWG  
meeting  
participants  
provided by  
ETURWG*

Break

**Tutorials'  
Early Afternoon  
Sessions** **ETURWG  
Meeting**  
*Invitation only*  
[14:00-15:30]

Coffee Break

**Tutorials'  
Late Afternoon  
Sessions** **ETURWG  
Meeting**  
*Invitation only*  
[16:00-17:30]

**Icebreaker Reception  
and Young Professionals Event**  
[18:00-20:00]

Library Garden, at the Conference  
Venue

**Tuesday**  
9 July 2024

Registration  
opens at 8am

**Plenary**  
[08:40-10:00]

Coffee Break

**Late Morning  
Sessions**  
[10:30-12:10]

Lunch served

**Early Afternoon  
Sessions**  
[13:40-15:20]

Coffee Break

**Late Afternoon  
Sessions**  
[15:50-17:30]

*Self-transfer  
to Hotel Monaco*

**Welcome  
Reception**  
[19:00-21:00]  
Hotel Monaco

**Wednesday**  
10 July 2024

**5K Run**  
[06:00-07:00]  
Ponte della Libertà

Registration  
opens at 8am

**Plenary**  
[08:40-10:00]

Coffee Break

**Late Morning  
Sessions**  
[10:30-12:10]

Lunch served

**Early Afternoon  
Sessions**  
[13:40-15:20]

Coffee Break

**Late Afternoon  
Sessions**  
[15:50-17:30]

**Boat Transfer  
to Hotel Excelsior  
Boarding at 18:00**

**Gala Dinner**  
[19:30-24:00]  
Hotel Excelsior

*Boat transfer  
back to the main  
island*

**Thursday**  
11 July 2024

Registration  
opens at 8am

**Plenary**  
[08:40-10:00]

Coffee Break

**Late Morning  
Sessions**  
[10:30-12:10]

Lunch served

**SIF Forum**  
[13:40-14:40]

**SIF Board**  
[15:00-18:00]  
*Invitation only*

**Board Event**  
[19:30-21:30]  
*Invitation only*

# Sunday, 7 July 2024

## ISBA-Fusion Workshop

Room: Aula Magna

08:30

08:45

09:30

Jordan, Michael  
Prediction-Powered Inference

09:45

10:15

Chopin, Nicholas  
Unbiased Monte Carlo estimation of  
smooth functions of expectations

10:45

*Coffee Break*

11:15

Campbell, Trevor  
Making Variational Methods Work  
for Statisticians

11:45

Meyer, Florian  
Graph-Based Localization and  
Tracking

12:15

Varshney, Pramod  
Bayesian Methods for Distributed  
Detection and Fusion

13:15

*Break*  
Lunch not provided

14:45

Bar-Shalom, Yaakov  
Fusion and Association with At-  
tributes / Classification

Meeting

15:45

Varshney, Pramod  
Distributed Inference and Informa-  
tion Fusion

16:45

*Coffee Break*

17:15

Blasch, Erik; Snidaro, Lauro  
High-level Fusion

Meeting

## Bootcamp

Room: 6A

*Opening*

Blasch, Erik  
Introduction to Information Fusion

Blair, Dale  
Estimation in Information Fusion

Coraluppi, Stefano  
Data Association

Govaers, Felix  
An Introduction to Track-to-Track  
Fusion

## OSTEWG Meeting *Invitation only*

Room: 3B

# Monday, 8 July 2024

## Overview

Tutorials		ETURWG Meeting
<a href="#">Various rooms, see below</a>		<a href="#">Invitation only</a>
		<a href="#">Room: 8B</a>
09:00	Early Morning Sessions	Meeting
10:30	Coffee break	
11:00	Late Morning Sessions	Meeting
12:30	Break <u>No lunch is provided for tutorial attendees</u>	Lunch for ETURWG meeting participants Provided by ETURWG
14:00	Early Afternoon Sessions	Meeting
15:30	Coffee break	
16:00	Late Afternoon Sessions	Meeting
17:30		
18:00	Icebreaker Reception and Young Professionals Event	
Library Garden at the Venue. Included in paid registrations to the main conference		

## Tutorials

### Full Day Tutorials

#### Tutorial 1

[Room: 2A](#)

Vladimirov, Lyudmil; Hiscocks, Steven; Wright, James; Perree, Nicola. **Practical Multi-target Tracking and Sensor Management with Stone Soup**

#### Tutorial 2

[Room: 3A](#)

Steinberg, Alan. **High-Level Information Exploitation**

#### Tutorial 3

[Room: 4A](#)

Leitinger, Erik; Meyer, Florian. **Graph-Based Localization, Tracking, and Mapping**

## Morning Tutorials

### Tutorial 4

[Room: 5A](#)

Chisci, Luigi; Farina, Alfonso; Gao, Lin; Battistelli, Giorgio. **Multiagent and Multiobject Estimation**

### Tutorial 5

[Room: 6A](#)

Govaers, Felix. **An Introduction to Track-to-Track Fusion and the Distributed Kalman Filter**

### Tutorial 6

[Room: 7A](#)

Rao, Nageswara. **Introduction to Machine Learning Generalization Theory with Information Fusion Applications**

### Tutorial 7

[Room: 8A](#)

Straka, Ondrej; Dunik, Jindrich. **Estimation of Noise Parameters in State Space Models**

### Tutorial 8

[Room: 9A](#)

Blasch, Erik; Snidaro, Lauro. **Context-enhanced Information Fusion**

### Tutorial 9

[Room: 10A](#)

Duraisamy, Bharanidhar; Yuan, Ting; Schwarz, Tilo; Fritzsche, Martin. **Multi Sensor and Data Fusion Approaches for Vehicular Automation Applications - Autonomous Driving: Concepts, Implementations and Evaluation**

## Afternoon Tutorials

### Tutorial 11

[Room: 5A](#)

García-Fernández, Ángel; Yuxuan, Xia. **Poisson Multi-Bernoulli Mixtures for Multiple Target Tracking**

### Tutorial 12

[Room: 2B](#)

Arora, Prashant; Kivelevitch, Elad. **Sensor Fusion and Tracking with MATLAB®**

### Tutorial 14

[Room: 7A](#)

Ristic, Branko. **Selected Topics in Sequential Bayesian Estimation**

### Tutorial 15

[Room: 8A](#)

Bar-Shalom, Yaakov. **Multitarget Tracking and Multisensor Information Fusion: Recently Developed Advanced Algorithms**

### Tutorial 16

[Room: 9A](#)

Honer, Jens; Baum, Marcus. **Multiple Extended Object Tracking for Automotive Applications**

### Tutorial 17

[Room: 10A](#)

De Farias, Claudio M. **Data Fusion for TinyML**

### Tutorial 18

[Room: 6A](#)

Govaers, Felix; Ulmke, Martin; Koch, Wolfgang. **Quantum Computing and Quantum Physics Inspired Algorithms: Introduction and Data Fusion Examples**

# Tuesday, 9 July 2024

## Overview

### Main Conference

[Various rooms, see below](#)

08:40 Plenary

10:00 *Coffee break*

10:30 Late Morning Sessions

12:10 *Lunch served*

13:40 Early Afternoon Sessions

15:20 *Coffee break*

15:50 Late Afternoon Sessions

[Self-transfer to Hotel Monaco](#)

19:00 Welcome Reception

Hotel Monaco

Included in paid registrations to the main conference

### Tour

#### [Classic Venice](#)

08:45-12:30

Times are approximate. Please check the exact time and arrangements at the registration desk

[Not included in the registration](#)

## Plenary. 08:40-10:00

### Plenary

Chair: Snidaro, Lauro

[Aula Magna with Streaming to Room 5A](#)

08:40 Snidaro, Lauro. **Organisers' announcements**

Lippiello, Tiziana – Magnifica Rettrice Università Ca' Foscari Venezia. **Welcome message**

09:00 Cristianini, Nello. **Machina Sapiens: How Machines Became Intelligent Without Thinking in a Human Way**

## Tuesday, 9 July 2024. Late Morning Sessions. 10:30-12:10

### Applications 1

#### *Surveillance and Radar*

[Room: 2A](#)

Chair: De Farias, Claudio M

10:30 Ristic, Branko; Kim, Du Yong; Rosenberg, Luke. **Track-Before-Detect for Airborne Maritime Radar: Application to Real Data**

10:50 Deleskog, Viktor; Jonsson, Oskar; Nygard, Jonas; Hendeby, Gustaf. **Poisson Multi-Bernoulli Mixture Filtering with Multistatic Passive Bistatic Radar**

11:10 Handke, Sebastian Thomas; Broetje, Martina; Steffes, Christian; Koch, Wolfgang. **Track Evaluation of GSM based Passive Radar: Model vs. Real-World Results**

11:30 Belfadel, Djedjiga; Haessig, David. **Optical Flow for Drone Horizontal Velocity Estimation without GPS**

11:50 Broetje, Martina. **Detection and tracking of airplanes on runways with passive radar data**

### JAIF Recently Published Papers

[Room: 5A](#)

Chair: Braca, Paolo

10:30 Yang, Rong; Bar-Shalom, Yaakov; Huang, Hong'An Jack. **Camera Calibration Using Inaccurate and Asynchronous Discrete GPS Trajectory Drones**

10:50 Frisch, Daniel; Hanebeck, Uwe. **The Generalized Fibonacci Grid as Low-Discrepancy Point Set for Optimal Deterministic Gaussian**

11:10 Anderson, Stephen L.; Stone, Lawrence; Maskell, Simon. **Repeated Filtering for Smoothing Particle Filters**

11:30 Wielandner, Lukas; Venus, Alexander; Wilding, Thomas; Leitinger, Erik. **Multipath-Based SLAM for Non-Ideal Reflective Surfaces Exploiting Multiple-Measurement Data Association**

11:50 Gaglione, Domenico; Soldi, Giovanni; Braca, Paolo. **Autonomous Mapping of Underwater Objects With the Sum-Product Algorithm**

### Bayesian Fusion Theory 1

#### *Robust Learning and Perception*

[Room: 3A](#)

Chair: Kaplan, Lance

Tang, Hanning; Shen, Xiaojing; Zhao, Hua; Wang, Zhiguo; Varshney, Pramod K. **Bures-Wasserstein Barycentric Coordinates with Application to Diffusion Tensor Image Smoothing**

Kandel, Deepak; Dera, Dimah. **Adaptive Robust Continual Learning based on Bayesian Uncertainty Propagation**

Schumacher, Max-Lion; Huber, Marco F. **Probabilistic Global Robustness Verification of Arbitrary Supervised Machine Learning Models**

Memon, Saleemullah; Krayani, Ali; Zontone, Pamela; Marcenaro, Lucio; Martin Gomez, David; Regazzoni, Carlo. **Learning 3D LiDAR Perception Models for Self-Aware Autonomous Systems**

Yoon, Han Jun; Matsumoto, Shou; Costa, Paulo; Cho, Jin-Hee. **Towards an Efficient Simulation-Based Anytime Inference in Subjective Bayesian Networks**

### AI for Fusion 1

#### *Interactive Autonomous Navigation*

[Room: 6A](#)

Chair: Govaers, Felix

Kawakami, Rikuto; Igeta, Yorito; Furukawa, Hidemitsu; Kakegawa, Moe; Suzuki, Yuto; Inagawa, Gianluca; Ogawa, Jun. **Physical Reservoir Computing for Interactive Estimation of Weight from Food Texture in 3D-Printed Soft Matter in Picking Operations**

Giurgi, Danut-Vasile; Dezert, Jean; Josso-Laurain, Thomas; Devanne, Maxime; Laffenburger, Jean-Philippe. **Fusion of Semantic Segmentation Models for Vehicle Perception Tasks**

Dill, Sebastian; Rohr, Maurice; Güney, Gökhan; Antink, Christoph Hoog. **Evaluation of Accuracy and Angle Dependency of 3D Pose Estimation through Stereo Camera Information Fusion with MediaPipe Pose**

Fierro, Nicolás; Adams, Martin; Cament, Leonardo. **Extended Target Tracking with 3D-INSEG and its Benefits in Dense Scenarios**

Sidheekh, Sahil; Tenali, Pranuthi; Mathur, Saurabh; Blasch, Erik; Natarajan, Sriraam. **On the Robustness and Reliability of Late Multi-Modal Fusion using Probabilistic Circuits**

### SS: Advanced Nonlinear Filtering 1

#### *Bayesian Filtering Techniques*

[Room: 4A](#)

Chair: Straka, Ondrej

Craft, Kyle J.; Demars, Kyle J. **A Variational Approach to Robust Bayesian Filtering**

Michaelson, Kristen; Popov, Andrey A.; Zanetti, Renato; Demars, Kyle J. **Particle Flow with a Continuous Formulation of the Nonlinear Measurement Update**

Prossel, Dominik; Hanebeck, Uwe D. **Spline-Based Density Estimation Minimizing Fisher Information**

Lopez, Enzo; Dahia, Karim; Merlinge, Nicolas; Winter-Bonnet, Benedicte; Maschiella, Alain; Musso, Christian. **Sequential Markov Chain Monte Carlo methods on Matrix Lie Groups**

Frisch, Daniel; Hanebeck, Uwe D. **Gaussian Mixture Particle Filter Step based on Method of Moments**

### SS: Extended Object and Group Tracking 1

#### *Extended Object Tracking Methods*

[Room: 7A](#)

Chair: Baur, Tim

Steuernagel, Simon; Thormann, Kolja; Baum, Marcus. **Random Matrix-based Tracking of Rectangular Extended Objects with Contour Measurements**

Wei, Yuan; Lan, Jian; Zhang, Le. **Multiple Extended Object Tracking Using PMHT with Extension-Dependent Measurement Numbers**

Kumru, Murat; Özkan, Emre. **Tracking Arbitrarily Shaped Extended Objects Using Gaussian Processes**

Strand, Leah; Honer, Jens; Knoll, Alois. **Joint Vehicle Pose and Extent Estimation in the Context of Multi-Camera Traffic Surveillance**

Bucco, Thomas John; Koliander, Günther; Kreidl, Bernd; Hlawatsch, Franz. **Online Learning of Model Parameters and Object Classes in Extended Multiobject Tracking**

Room not in use

Room: 8A

SS: Cooperative localization and multi-target tracking over networks 1  
*Cooperative Localization Algorithms*

Room: 9A

Chair: Coraluppi, Stefano; Willett, Peter

SS: Multimodal Data and Explainable AI for Healthcare and Surveillance Technologies 1  
*Time-Series and Multimodal Prediction*

Room: 10A

Chair: Mihaylova, Lyudmila

10:30

10:50

Zhang, Guoxin; Liang, Yunfei; Wang, Cong; Yi, Wei; Ngo, Hien Quoc; Matthaiou, Michail; Varshney, Pramod K. **Decentralized Direct Localization Based on Gauss-Newton Method in Multi-Sensor Networks**

11:10

Adas, Akif; Barbieri, Luca; Awasthi, Satyesh; Morri, Pietro; Mentasti, Simone; Arrigoni, Stefano; Sabbioni, Edoardo; Nicoli, Monica. **LiDAR-Aided Cooperative Localization and Environmental Perception for CAVs**

Nash, Christian; Nair, Rajesh; Naqvi, Syed Mohsen. **Cross-Modal Attention for Multimodal Information Fusion: A Novel Approach to Attention Deficit Hyperactivity Disorder Detection**

11:30

Zhang, Donglin; Duan, Zhansheng; Sun, Yiyong; Yin, Feng. **LMMSE-Aided WLLS Location Estimators for Source Localization with RSS Measurements**

Wang, Jiale; Ng, Gee Wah; Mak, Lee Onn; Cher, Randall; Ryan, Ng Ding Hei; Wang, Davis. **QCaption: Video Captioning and Q&A through Fusion of Large Multimodal Models**

11:50

Ma, Wen; Zhu, Hongyan. **Source Localization Using TDOA with Sensor Position Errors Based on Constrained Total Least Squares and ADMM**

## Tuesday, 9 July 2024. Early Afternoon Sessions. 13:40-15:20

Applications 2

*Smart Infrastructure and Sensor Networks*

Room: 2A

Chair: Belfadel, Djedjga

13:40 Hubner, Michael; Wohleben, Kilian; Litzberger, Martin; Veigl, Stephan; Opitz, Andreas; Grebien, Stefan; Dvorak, Maria-Theresia. **A Bayesian Approach - Data fusion for robust detection of vandalism and trespassing related events in the context of railway security**

14:00 Wang, Zhaohui; Zhang, Yue; Zhou, Jin; Cai, Haohao; Liu, Xichun; Wang, Jianji; Zheng, Nanning. **CuES: Conditional Uncorrelation-based Characteristic Enhancement and Fusion of Electrical Signals**

14:20 Do Nascimento, Vinicius D.; De Farias, Claudio M.; Dutra, Diego L. C.; Alves, Tiago A. O. **Ensemble Learning Approaches for Detecting Fishing Activity in Maritime Surveillance: A Performance Evaluation**

14:40 Gruden, Pina; Nosal, Eva-Marie; Henderson, E. Elizabeth. **Automated Acoustic Tracking of a Sperm Whale (*Physeter macrocephalus*) using a Wide Baseline Array of Sensors**

15:00 Monteiro Junior, Almir Antônio; Brandao, Diego; Da Rocha Henriques, Felipe; De Faria, Claudio M.; González, Pedro Henrique. **Optimizing Wireless Sensor Network Planning: Integrating Biased Random-Key Genetic Algorithm and Local Branching for Scalable Solutions**

Bayesian Fusion Theory 2

*Decentralized Data Fusion and Tracking*

Room: 3A

Chair: Costa, Paulo

Shin, Changkyo; Dagan, Ofer; Ahmed, Nisar; Choi, Han-Lim. **Fault-tolerant Bayesian Decentralized Data Fusion Using Reliability Variables and Mixture Models**

Zhu, Xinchao; Yang, Chaoqun; Zhou, Chengwei; Shi, Zhiguo. **CBMeMber Filter based Resolvable Group Target Tracking via Graph Theory and Leader-Follower Model**

Bondarchuk, Jennifer; Trezza, Anthony; Bucci, Donald J. **Efficient Implementation of Multi-sensor Adaptive Birth Samplers for Labeled Random Finite Set Tracking**

Wei, Shaoxiu; Liang, Mingchao; Meyer, Florian. **A New Architecture for Neural Enhanced Multiobject Tracking**

SS: Advanced Nonlinear Filtering 2

*Spectral Differentiation and Particle Filtering*

Room: 4A

Chair: Hanebeck, Uwe

Matousek, Jakub; Duník, Jindrich; Brandner, Marek. **Efficient Spectral Differentiation in Grid-Based Continuous State Estimation**

Tamir, Ella; Solin, Arno. **Learning to Approximate Particle Smoothing Trajectories via Diffusion Generative Models**

Brady, John-Joseph; Luo, Yuhui; Wang, Wenwu; Elvira, Víctor; Li, Yunpeng. **Regime Learning for Differentiable Particle Filters**

Liu, Zixin; Tiller, Zachary; Godsill, Simon. **Inference for Non-Gaussian Dynamical Models with Time-varying Skew**

Ajirak, Marzieh; Liu, Yuhao; Djuric, Petar M. **Filtering of High-Dimensional Data for Sequential Classification**

Detection and Localisation 1

*Multi-channel Integration and Localization*

Room: 5A

Chair: Crouse, David F.

- 13:40 Wang, Mingxing; Li, Xiao; Li, Xiaolong; Gao, Longji; Chen, Desheng; Cui, Guolong. **An Integration Detection Approach for High-Speed Maneuvering Target in Airborne Coherent MIMO Radar**
- 14:00 Deng, Jiangyun; Sun, Zhi; Chen, Haixu; Li, Xiaolong; Cui, Guolong; Yang, Xiaobo. **Passive Localization Method of LFM Signal Transmitter based on Multi-channel Joint Accumulation in FrFT Domain**
- 14:20 Goderik, Daniel; Westlund, Albin; Zetterqvist, Gustav; Gustafsson, Fredrik; Hendeby, Gustaf. **Seismic Detection of Elephant Footsteps**
- 14:40 Chen, Desheng; Li, Xiaolong; Wang, Mingxing; Guan, Lingjie; Cui, Guolong. **A Computationally Efficient Multi-Channel Multi-Pulse Coherent Fusion Algorithm for High-Speed Target Detection**
- 15:00 Daniyan, Abdullahi; Inchingolo, Alessio V.; Mcainsh, Andrew; Burroughs, Nigel. **Enhanced Kinetochore Detection During Mitotic Human Cell Division using CFAR**

Target Tracking 1

*Multiobject Tracking Optimization*

Room: 8A

Chair: Blair, William D

- 13:40 Kropfreiter, Thomas; Williams, Jason L.; Meyer, Florian. **Multiobject Tracking for Thresholded Cell Measurements**
- 14:00 Chance, Zachary. **Adaptive Temporal Decorrelation of State Estimates**
- 14:20 Streit, Roy L. **Bayes Optimal Cardinality Filters for Streaming Count Data**
- 14:40 Ketterer, Pascal; Hoher, Patrick; Reuter, Johannes. **Runtime Optimization in Interacting Multiple Model Filtering with Down-Sampling and Out-of-Sequence Measurements**
- 15:00 Scheible, Alexander; Griebel, Thomas; Buchholz, Michael. **Self-Monitored Clutter Rate Estimation for the Labeled Multi-Bernoulli Filter**

AI for Fusion 2

*Data Fusion Algorithms*

Room: 6A

Chair: Dezert, Jean

- Rao, Nageswara S. V.; Ma, Chris Y. T.; He, Fei. **ML Classifier Fusion for Three Data Streams with Quality Inversely Proportional to Time Resolution**
- Yeo, Kiat Nern; Lau, Yan Ling; Ng, Gee Wah. **Data Fusion Pipeline for UAV-Based Real-Time Night Crowd Counting for Public Safety**
- Wei, Xinwei; Zhang, Linao; Lin, Yiru; Wei, Jianwei; Zhang, Chenyu; Yi, Wei. **Transformer-based Multi-Sensor Hybrid Fusion for Multi-Target Tracking**
- Hou, Elizabeth; Greenwood, Ross; Kumar, Piyush. **Machine Learning Models for Improved Tracking from Range-Doppler Map Images**
- Govaers, Felix. **A Quantum Algorithm for the Prediction Step of a Bayesian Recursion**

SS: Cooperative localization and multi-target tracking over networks 2

*Multi-Sensor Tracking*

Room: 9A

Chair: Braca, Paolo; Brambilla, Mattia

- Mazzi, Ludovico; Brambilla, Mattia; Guardiani, Michele; Arpaio, Maximilian James; Nicoli, Monica. **Aircraft Localization by Interacting Multiple Model Filtering in Wide Area Multilateration**
- Broghammer, Fabio; Wiedemann, Thomas; Zhang, Siwei; Dammann, Armin; Gentner, Christian; Djuric, Petar M. **Localization and Sensing on Vulcano Island - A Glimpse into Future Space Exploration with Swarms**
- Wolf, Laura M.; Baum, Marcus. **Track-to-track Association based on Deterministic Sampling using Herding**
- Schuster, Sonja; Wetzal, Johannes; Zeitvogel, Samuel; Laubenheimer, Astrid. **Automatic Extrinsic Multi-Sensor Network Calibration based on Time Series Matching**

SS: Extended Object and Group Tracking 2

*Multi-Target Tracking Algorithms*

Room: 7A

Chair: Baum, Marcus

- Ding, Guanhua; Liu, Jianan; Xia, Yuxuan; Huang, Tao; Zhu, Bing; Sun, Jinping. **LiDAR Point Cloud-Based Multiple Vehicle Tracking with Probabilistic Measurement-Region Association**
- Wu, Qinchen; Sun, Jinping; Yang, Bin. **Trajectory Poisson Multi-Bernoulli Filter for Group Target Tracking**
- Yurdakul, Ogul Can; Çetinkaya, Mehmet; Celebi, Enescan; Özkan, Emre. **A Rao-Blackwellized Particle Filter for Superelliptical Extended Target Tracking**
- Fontana, Marco; Hayder, Thomas; Freilinger, William; García-Fernández, Ángel F.; Maskell, Simon. **A Poisson Multi-Bernoulli Mixture approach to tracking trains using Distributed Acoustic Sensing**
- Zeng, Jing; Mannari, Prabhanjan; Acharya, Aalok; Tharmarasa, Ratnasingham. **Radar Data Clustering and Bounding Box Estimation with Doppler Measurements**

SS: Multimodal Data and Explainable AI for Healthcare and Surveillance Technologies 2

*Secure Data Fusion*

Room: 10A

Chair: Naqvi, Mohsen

- Molhoek, Madelon; Van Laanen, Joris. **Secure Counterfactual Explanations in a Two-party Setting**
- Liu, Xingchi; Mihaylova, Lyudmila. **Active Sensing for Target Tracking: A Bayesian Optimisation Approach**
- Li, Yichun; Li, Shuanglin; Naqvi, Syed Mohsen. **A Novel Audio-Visual Information Fusion System for Mental Disorders Detection**
- Xie, Leiyu; Angelini, Federico; Naqvi, Syed Mohsen. **NCL-DASB: GEO-Located Maritime Surveillance Labeled Dataset and Annotation API**
- Zhao, Yun; Grayden, David B.; Boley, Mario; Liu, Yueyang; Karoly, Philippa J.; Cook, Mark J.; Kuhlmann, Levin. **Inference-based time-resolved chaos analysis of brain models: application to focal epilepsy**



## Tuesday, 9 July 2024. Late Afternoon Sessions. 15:50-17:30

### Applications 3

#### *Tracking and Localization in Dynamic Environments*

Room: 2A

Chair: Hendeby, Gustaf

15:50 Grimmert, Douglas J. **Fused Tracking of Pulsed and Continuous Active Sonar Transmission Modes**

16:10

16:30 Gade, Brita H. Hafskjold; Kloster, Morten; Vooren, Carina N.; Sjöberg, Alexander Meyer. **Multi-target tracking within large geographical areas - algorithms for improved accuracy and speed**

16:50 Löffler, Wendi; Bengtsson, Mats. **Train Localization During GNSS Outages: A Minimalist Approach Using Track Geometry And IMU Sensor Data**

17:10 Bencivenga, Pasquale; Isoletta, Giorgio; Opromolla, Roberto; Fasano, Giancarmine. **Attitude Motion Characterization of Resident Space Objects via Fusion of Ground-based and Space-based Light Curves**

### Bayesian Fusion Theory 3

#### *Probabilistic Localization and Target Tracking*

Room: 3A

Chair: Jauffret, Claude

Watkins, Luisa; Stinco, Pietro; Tesei, Alessandra; Meyer, Florian. **A Probabilistic Focalization Approach for Single Receiver Underwater Localization**

Leroy, Idyano; Saucan, Augustin A.; Petetin, Yohan; Clark, Daniel. **An Analysis of the Mutual Information Upper Bound for Sensor-Subset Selection**

Zhang, Wenyu; Khojasteh, Mohammad Javad; Meyer, Florian. **Particle Flows for Source Localization in 3-D Using TDOA Measurements**

Lee, Sung-Joo; Jung, Boyoung; Park, Seung-Jin; Ra, Won-Sang. **Re-entry Target Identification with RCS Measurements Considering Multi-radar Geometry**

Jung, Boyoung; Lee, Chan-Seok; Ra, Won-Sang. **Ballistic Target Tracking Using Range Spread Measurements of a Wideband Radar Seeker**

### SS: Advanced Nonlinear Filtering 3

#### *Particle Filters and Kalman Algorithms*

Room: 4A

Chair: Meyer, Florian

Mamich, Rachel; Michaelson, Kristen; Popov, Andrey A.; Zanetti, Renato. **Burnished Flow Filter**

Kumar, Kundan; Särkkä, Simo. **Polynomial Chaos Expansion Based Rauch-Tung-Striebel Smoothers**

Shaheen, Khadija; Chawla, Apoorva; Uilhoorn, Ferdinand Evert; Salvo Rossi, Pierluigi. **Partial-Distributed Filtering for Fault Detection, Isolation and Accommodation in Natural-Gas Pipelines**

Zhou, Yujing; Beeson, Ryne. **Projected Feedback Particle Filtering for Chaotic Dynamical Systems Using Lyapunov Vectors**

Raitoharju, Matti; García-Fernández, Ángel F.; Ali-Löytty, Simo; Särkkä, Simo. **Stacked iterated posterior linearization filter**

### Detection and Localisation 2

#### *Localization and Tracking Methods*

Room: 5A

Chair: Zetterqvist, Gustav

15:50 Crouse, David Frederic. **Debiasing Nonlinear Transformations Involving Correlated Measurement Components**

16:10 Thormann, Kolja; Steuernagel, Simon; Baum, Marcus. **Indoor Localization based on Short-Range Radar and Rotating Landmarks**

16:30 Forkel, Bianca; Berthold, Philipp; Maehlich, Mirko. **Taking Advantage of Road Users Occluding the Road: Supporting Camera-based Road Tracking in Shared Spaces using Radar Doppler Measurements**

16:50 Harvey, Ryan; Pattipati, Krishna; Willett, Peter. **A CRLB for Passive Only TDOA Localization From a Three-Dimensional Hydrophone Array**

17:10 Michaelis, Martin; Berthold, Philipp; Luettel, Thorsten; Maehlich, Mirko. **Multimodal Odometry Estimation With Automated Sensor Selection**

### AI for Fusion 3

#### *Complex Systems Analysis*

Room: 6A

Chair: Adams, Martin

Hao, Chunyu; Song, Xiaoying; Yang, Fang; Zheng, Wanning; Zhou, Yufeng. **Fusion of Individual and Population Graphs in a GNN Brain Disease Network**

Walker, Markus; Amirkhani, Hayk; Huber, Marco F.; Hanebeck, Uwe D. **Trustworthy Bayesian Perceptrons**

Shahsafi, Soroush; Naderkhani, Farnoosh. **Enhancing Stock Trading Performance with Deep Q-Learning by Addressing Noisy Data through Advanced Denoising Techniques**

Jia, Haowei; Wang, Gan; Liu, Huajun. **Spatial-Temporal Attention Network for Track-Track Association with Biased Data**

### SS: Extended Object and Group Tracking 3

#### *Simultaneous Localization and Mapping*

Room: 7A

Chair: Hoher, Patrick

Brouk, James D.; Demars, Kyle J. **Anonymous, Extent-Informed Navigation for Map-Based Localization using Random Finite Sets**

Gramsch, Christian; Yang, Shishan; Alqaderi, Hosam. **A Batch Update Using Multiplicative Noise Modelling for Extended Object Tracking**

Wielandner, Lukas; Venus, Alexander; Wilding, Thomas; Witrisal, Klaus; Leitinger, Erik. **MIMO Multipath-based SLAM for Non-Ideal Reflective Surfaces**

Kurz, Marcel; Hoffmann, Folker; Brandenburger, Andre; Charlish, Alexander. **Investigating the effect of variable UAV altitude control on emitter localization**

**Target Tracking 2**

*Passive Sonar and Multi-Sensor Fusion*

Room: 8A

Chair: Godsill, Simon

- 15:50 Carloni Gertosio, Rémi; Gaonach, Gilles; Beyna, Enzo; Martin, Liana; Meyrat, Alexis. **Passive Sonar Ranging and Range-Doppler-Bearing Target Motion Analysis**
- 16:10 Blair, W. Dale; Bar-Shalom, Yaakov. **Design of Two-Model IMM Estimators for Tracking Maneuvering Targets**
- 16:30 Miao, Qing; Zou, Zhiyuan; Li, Wujun; Yi, Wei. **Track-Before-Detect for Automotive Multi-Radar Systems with Time-Varying Fields of View**
- 16:50 Wakefield, Joshua J.; Neal, Adam; Haslinger, Stewart; Ralph, Jason F. **Sonar Path Planning Using Reinforcement Learning**
- 17:10 Hoyt, Shaun J.; Blair, W. Dale; Lanterman, Aaron D. **Non-Linear Bias Mitigation in Multi-Sensor Multi-Track Fusion**

**Fusion for Next Generation AI Applications, from the Perspective of Teen Researchers**

Room: 9A

Chair: Yuan, Ting

Moderator: Belfadel, Djedjiga

Teen Panelists: Chen, Sibe; Huang, Justin; Lai, Kevin; Zhao, Yiyi

Maestro Panelists: Lindquist, Anders; Picci, Giorgio

**High-Level Fusion 1**

*Multi-vector and MIMO Radar*

Room: 10A

Chair: Svenson, Pontus

Gao, Zhaoqiang; He, Jiazhou; Zhang, Heng. **Multi-vector Matching Deformation Measurement Method**

Maresca, Salvatore; Malacarne, Antonio; Amir, Malik Muhammad Haris; Ahmad, Fawad; Pandey, Gaurav; Bogoni, Antonella; Scaffardi, Mirco. **Genetic Algorithms for Distributed MIMO Radar Antenna Position Optimization**

Yang, Xiaowei; Liu, Haiqi; Zhao, Hua; Meng, Fanqin; Shen, Xiaojing. **Set-Valued Modeling for Drop-Point Constrained Dynamic Systems**

Nagao, Hiromichi; Ito, Shin-Ichi; Matsumura, Mitsuru. **Dominant Mode Extraction Based on the Four-Dimensional Variational Method**

# Wednesday, 10 July 2024

## Overview

06:00 [5K Run](#)

Ponte della Libertà

Times are approximate. Please check the exact time and arrangements at the registration desk

Race registration is required

### [Main Conference](#)

Various rooms, see below

08:40 Plenary

10:00 *Coffee break*

10:30 Late Morning Sessions

12:10 *Lunch served*

13:40 Early Afternoon Sessions

15:20 *Coffee break*

15:50 Late Afternoon Sessions

18:00 *Boat Transfer to Hotel Excelsior*

*Included in paid registrations to the main conference*

19:30 [Gala Dinner](#)

Hotel Excelsior

Included in paid registrations to the main conference

*Detailed programme of the evening below*

*Boat transfer back to main island*

### [Tour](#)

[Murano and Burano Island](#)

08:45-12:30

Times are approximate. Please check the exact time and arrangements at the registration desk

Not included in the registration

## Plenary. 08:40-10:00

### [Plenary](#)

Chair: Cerutti, Federico

[Aula Magna with Streaming to Room 5A](#)

08:40 Snidaro, Lauro. **Organisers' announcements**

Hanebeck, Uwe - ISIF President. **Welcome message**

09:00 Severini, Simone. **Quantum Technologies: Dream or Reality?**

## Wednesday, 10 July 2024. Late Morning Sessions. 10:30-12:10

### Applications 4

#### *Multi-lane Traffic Analysis*

Room: 2A

Chair: Cominelli, Marco

10:30 Cao, Xi; Tian, Yunlian; Yang, Jiaye; Li, Wujun; Yi, Wei. **Trajectory PHD Filter for Extended Traffic Target Tracking with Interaction and Constraint**

10:50 Tian, Yunlian; Cao, Xi; Li, Wujun; Yi, Wei. **Incorporating Heading Restrictions for Multilane-Road Target Tracking Using Radar Sensor**

11:10 Xia, Yuxuan; Stenborg, Erik; Fu, Junsheng; Hendeby, Gustaf. **Bayesian Simultaneous Localization and Multi-Lane Tracking Using Onboard Sensors and a SD Map**

11:30 Kornfeld, Nils; Leich, Andreas; Roth, Michael. **Kalman filtering aspects in camera and deep learning based tracking for traffic monitoring**

11:50 Jin, Yuchuan; Stenhammar, Theodor; Benjmer, David; Beauvisage, Axel; Xia, Yuxuan; Fu, Junsheng. **Towards Accurate Ego-lane Identification with Early Time Series Classification**

### SS: Marine Surface Situational Awareness 1 *Autonomous Maritime Tracking and Navigation*

Room: 5A

Chair: Brekke, Edmund

10:30 Herrmann, Lukas; Brekke, Edmund Forland; Eide, Egil. **Coherent Integration of Optical Flow for Track-Before-Detect Radar Detection**

10:50 Hilmarsen, Henrik; Dalhaug, Nicholas; Anthonsen Nygard, Trym; Brekke, Edmund Forland; Mester, Rudolf; Stahl, Annette. **Maritime Tracking-By-Detection with Object Mask Depth Retrieval Through Stereo Vision and Lidar**

11:10 Dalhaug, Nicholas; Stahl, Annette; Mester, Rudolf; Brekke, Edmund Forland. **Combining Short and Wide Baseline Stereo Cameras for Improved Maritime Target Tracking**

11:30 Grini, Jon Torgeir; Mester, Rudolf; Anthonsen Nygard, Trym; Dalhaug, Nicholas; Brekke, Edmund Forland; Stahl, Annette. **FusedWSS: Water Surface Segmentation Fusing Machine Learning and Geometric Cues**

11:50 Thompson, Fletcher; Hansen, Peter; Nicholas, Galeazzi; Roberto, Palma; Marco, Brock; Andreas Libonati; Mariani, Patrizio. **Autonomous Inspection and Data Fusion for Maritime Critical Infrastructures**

### Bayesian Fusion Theory 4

#### *Biased Measurements and Data Fusion*

Room: 3A

Chair: Servadio, Simone

Pérez, Annie-Claude; Jauffret, Claude. **What to Do with Biased Measurements?**

Yu, Jingyi; Pychynski, Tim; Barsim, Karim Said; Huber, Marco F. **Causal Knowledge in Data Fusion: Systematic Evaluation on Quality Prediction and Root Cause Analysis**

Valeyrie, Nicolas; Houssineau, Jérémie; Strode, Christopher; Pailhas, Yan. **On the Estimation of the Size of a Target Population**

Ioannou, Giorgio; Gaglione, Domenico; Millefiori, Leonardo M.; Renga, Alfredo; Braca, Paolo; Willett, Peter. **Dark-VADER: Detection of Anomalous AIS Message Delays for Maritime Situational Awareness**

Ferry, James P.; Ahmed, Adam S. **A Bayesian Decision Theory Paradigm for Test and Evaluation**

### AI for Fusion 4

#### *Distributed Learning and Multi-Agent*

Room: 6A

Chair: Govaers, Felix

Hu, Zhuohan; Yang, Bo; Lin, Jialiang; Wu, Jiajin; Liu, Wei. **MCL4SRec: A Sequential Recommendation Model with Multi-level Contrastive Learning**

Camajori Tedeschini, Bernardo; Brambilla, Mattia; Nicoli, Monica; Win, Moe Z. **Cooperative Positioning with Multi-Agent Reinforcement Learning**

Yang, Jihao; Nie, Laisen; Deng, Xinyang; Jiang, Wen. **A Federated Learning Mechanism with Feature Drift for Feature Distribution Skew**

Alemaw, Abrham Shiferaw; Zontone, Pamela; Marcenaro, Lucio; Marin, Pablo; Martin Gomez, David; Regazzoni, Carlo. **Integrated Learning and Decision Making for Autonomous Agents through Energy based Bayesian Models**

Dassori, Ignacio; Adams, Martin; Vasquez, Jorge. **Four-Legged Gait Control via the Fusion of Computer Vision and Reinforcement Learning**

### SS: Advanced Nonlinear Filtering 4

#### *Gaussian Mixture Filters*

Room: 4A

Chair: Dunik, Jindrich

Durant, Dalton; Popov, Andrey A.; Zanetti, Renato. **What are You Weighting For? Improved Weights for Gaussian Mixture Filtering**

Popov, Andrey A.; Zanetti, Renato. **Are Non-Gaussian Kernels Suitable for Ensemble Mixture Model Filtering?**

Giraldo-Gruesso, Felipe; Popov, Andrey A.; Zanetti, Renato. **Gaussian Mixture-Based Point Mass Filtering**

Ajgl, Jiri; Straka, Ondrej. **On fusion of probability density functions using tensor train decomposition**

Beeson, Ryne. **Generalized Bernoulli Gauss von Mises Distribution for Uncertainty Realism on Saddle-Center Spaces**

### SS: Evaluation of Technologies for Uncertainty Reasoning 1

#### *Time-Dependent Conflict Analysis*

Room: 7A

Chair: Kaplan, Lance

Wodtko, Thomas; Griebel, Thomas; Scheible, Alexander; Buchholz, Michael. **Conflict Handling in Time-Dependent Subjective Networks**

Mignet, Franck C.; Slijkhuis, Filip; Abouhafa, Abdelhaq; Pavlin, Gregor; Laskey, Kathryn B. **A Qualitative Causal Approach to Determining Adequate Training Data Quantity for Machine Learning**

Jousselme, Anne-Laure; Pannetier, Benjamin. **From tactical picture to situation assessment evaluation: A CUAS illustration**

Jousselme, Anne-Laure; Costa, Paulo C.; Akli, Aurélie; Arcieri, Gianfranco. **A model for an imperfect knowledge base for high-level information fusion experiments**

**Non-Bayesian Fusion Theory 1**  
*Credal and Dempster-Shafer Networks*

Room: 8A

Chair: Belfadel, Djedjiga

10:30 Ristic, Branko; Benavoli, Alessio. **Credal Valuation Network for Ongoing Threat Assessment**

10:50 Chen, Zhijin; Ristic, Branko; Kim, Du Yong. **Autonomous Area Search in the Framework of Possibility Theory**

11:10 Jacquemart, Alexandre; Hadj-Bachir, Mokrane; Ieng, Sio-Song; Gruyer, Dominique. **A new Method for parametric BBF generation**

11:30 Li, Siyuan; Han, Deqiang; Dezert, Jean; Yang, Yi. **Learning-Based BBA Modeling Approach with Multi-Method Fusion**

11:50

**SS: Multi-modal Fusion for Assured Positioning, Navigation, and Timing (PNT) 1**  
*Intelligent Navigation and Localization*

Room: 9A

Chair: Hendeby, Gustaf

Salhi, Mohammed; Al Hage, Joelle. **Zonotopic and Gaussian Information Filter for High Integrity Localization**

Fetzer, Toni; Bullmann, Markus; Kastner, Steffen; Deinzer, Frank; Grzegorzec, Marcin. **Advancing Smartphone-based Indoor Positioning through Particle Distribution Optimization**

Bavirisetti, Durga Prasad; Kiss, Gabriel Hanssen; Lindseth, Frank. **A Pole Detection and Geospatial Localization Framework using LiDAR-GNSS Data Fusion**

Siebler, Benjamin; Lehner, Andreas; Sand, Stephan; Hanebeck, Uwe D. **Magnetic Field Mapping of Railway Lines with Graph SLAM**

Liang, Zhonghong; Liao, Zhikun; Luo, Hui; Wang, Yuanhan; Mu, Pengcheng; Wang, Lin. **Collaborative Calibration Algorithm in Redundant Dual-axis RINS Configuration**

**HLIF Challenge**

Room: 10A

Chair: Laudy, Claire

Discussion on the HILF Challenge

**Wednesday, 10 July 2024. Early Afternoon Sessions. 13:40-15:20**

**Applications 5**  
*Sensor Fusion and Depth Completion*

Room: 2A

Chair: Kim, Du Yong

13:40 Vetrekar, Narayan; De Ataide, Marissa; Patel, Krishna; Ramachandra, Raghavendra; Gad, R. S. **Does fusion of complementary spectral bands improve the cross-illumination on the performance of gender prediction?**

14:00 Song, Tieshuai; He, Guidong; Yang, Bin; Dong, Zhao; Wang, Jun; Zhong, Fengjun. **mmWave Radar and Image Fusion for Depth Completion: a Two-Stage Fusion Network**

14:20 Zelioli, Luca; Farahnakian, Fahimeh; Farahnakian, Farshad; Middleton, Maarit; Heikkonen, Jukka. **Enhancing Peatland Classification using Sentinel-1 and Sentinel-2 Fusion with Encoder-Decoder Architecture**

14:40 Ting, Albert; Shapero, Samuel. **Scaling Sparse Approximation with a Two-Layer Spiking Locally Competitive Algorithm**

15:00

**Bayesian Fusion Theory 5**  
*Uncertainty Propagation*

Room: 3A

Chair: Jauffret, Claude

Servadio, Simone; Lavezzi, Giovanni; Hofmann, Christian; Wu, Di; Linares, Richard. **Propagation of Uncertainty with the Koopman Operator**

Liu, Yi; Li, Xi; Yang, Le; Mihaylova, Lyudmila; Li, Ji. **On the Gaussian Filtering for Nonlinear Dynamic Systems Using Variational Inference**

Straka, Ondrej; Havlík, Jindrich. **Design of Unitless Normalized Measure of Nonlinearity for State Estimation**

Pravong, Vivien; Condomines, Jean-Philippe; Öman Lundin, Gustav; Puechmorel, Stéphane. **Unscented Kalman Filter using Optimal Quantization**

**SS: Advanced Nonlinear Filtering 5**  
*Particle Filters in Navigation*

Room: 4A

Chair: Prossel, Dominik

Hubert, Bastien; Dahia, Karim; Merlinge, Nicolas; Giremus, Audrey. **Adaptive Kriging Particle Filter and its Application to Terrain-Aided Navigation**

Landzaat, Tom; Driessen, Hans; Van Hintum, Hans. **TDOA based ADS-B validation using a Particle Filter and Statistical Hypothesis testing**

Gehlen, Joshua; Ulmke, Martin; Springer, Jan-nik; Govaers, Felix; Koch, Wolfgang. **Tensor Decomposition based Bearing-Only Target Tracking - an Analysis based on Real Data**

Musso, Christian; Lefebvre, Sidonie; Thetas, Sophie. **Moving target's detection performances in a sequence of infrared multi-spectral images**

**SS: Marine Surface Situational Awareness 2**  
*Radar and Maritime Trajectory Analysis*

Room: 5A

Chair: Galeazzi, Roberto

- 13:40 Bogner, Mirjam; Pieper, Fynn; Steger, Christian; Steidel, Matthias; Piotrowski, Janusz A.; Feuerstack, Sebastian. **Utilizing 1D FMCW Radar Data for Distance Estimation to Port Infrastructure**
- 14:00 Hangerhagen, Petter; Brekke, Edmund; Forland, Eide, Egil; Skjetne, Roger. **A Radar Dataset from the Trondheim City Canal**
- 14:20 D'Afflisio, Enrica; Millefiori, Leonardo M.; Braca, Paolo; Guerriero, Marco. **MARITRAC: Maritime trajectory classification using object instance segmentation with model-based generated data augmentation**
- 14:40 Sjöberg, Alexander M.; Gade, Brita H. H.; Vooren, Carina; Kloster, Morten. **Association of SAR Measurements in Coastal Regions using Existing Tracks of Marine Vessels**
- 15:00 Donandt, Kathrin; Söffker, Dirk. **Incorporating Navigation Context into Inland Vessel Trajectory Prediction: A Gaussian Mixture Model and Transformer Approach**

**Target Tracking 3**  
*Object Tracking and Localization*

Room: 8A

Chair: Ablavsky, Vitaly

- 13:40 Gao, Lin; Battistelli, Giorgio; Chisci, Luigi. **Extended object tracking based on superellipses**
- 14:00 Xiao, Zhuo; Yang, Yi; Zhang, Sixian; Li, Wenbiao; Bao, Pengrong; Han, Deqiang. **Foreground Aware Correlation Filter with Adaptive Feature Response Fusion for Real-Time UAV Tracking**
- 14:20 Yang, Jiaye; Xiong, Yuhuan; Cao, Xi; Peng, Cong; Yi, Wei. **Joint Tracking and Classification of Vehicles with the PHD Filter and Gaussian Processes**
- 14:40 Krejčí, Jan; Kost, Oliver; Straka, Ondrej; Duník, Jindřich. **Pedestrian Tracking with Monocular Camera using Unconstrained 3D Motion Model**
- 15:00 Cozens, James M.; Godsill, Simon J. **Bimodal Multi-Object Localisation, Siteswap Inference, and Analysis for Competitive Juggling**

**AI for Fusion 5**  
*Deep Learning in Sensing*

Room: 6A

Chair: Willett, Peter

- Li, Can; Liu, Zhunga; Pan, Quan; Bai, Xi; Anglong; Zhang, Zuowei; Pan, Kunpeng. **Land-Sea Clutter Classification for Over-the-Horizon Radar via Dual Attention Aided Residual Neural Networks**
- Liu, Yang; Liu, Yu; Wang, Xueqian; Zhang, Linping; Jiang, Zhizhuo; Li, Yaowen; Yan, Chenggang; Fu, Ying; Zhang, Tao. **A Cross-modal Fusion Method for Multispectral Small Ship Detection**
- Ouled Sghaier, Moslem; Hadzagic, Melita; Ye Yu, Jun; Shton, Sofia; Shahbazian, Elisa. **Leveraging Generative Deep Learning Models for Enhanced Change Detection in Heterogeneous Remote Sensing Data**
- Choi, Eunjee; Kim, Jong-Kook. **TT-BLIP: Enhancing Fake News Detection Using BLIP and Tri-Transformer**

**SS: Multi-modal Fusion for Assured Positioning, Navigation, and Timing (PNT) 2**  
*Localization and Position Estimation*

Room: 9A

Chair: Dunik, Jindřich

- Weng, Xu; Ling, Keck-Voon; Liu, Haochen; Cao, Kun. **Towards End-to-End GPS Localization with Neural Pseudorange Correction**
- Kang, Jeong Min; Sjanic, Zoran; Hendeby, Gustaf. **Visual-Inertial Odometry Using Optical Flow from Deep Learning**
- El Bouch, Sara; Labsir, Samy; Renaux, Alexandre; Vilà-Valls, Jordi; Chaumette, Eric. **An Intrinsic Modified Cramér-Rao Bound on Lie Groups**
- Mu, Pengcheng; Jin, Shilong; Liao, Zhikun; Liang, Zhonghong; Wang, Yuanhan; Wang, Lin. **A Self-calibration Kalman Filter Algorithm for Dual-axis RINS Based on the Transverse Ellipsoidal Earth Model**
- Sel, Artun; Hayek, Samer; Kassas, Zaher M. **Robust Position Estimation using Range Measurements from Transmitters with Inaccurate Positions**

**SS: Evaluation of Technologies for Uncertainty Reasoning 2**  
*Uncertainty and Time Analysis*

Room: 7A

Chair: Costa, Paulo C.; Joussetme, Anne-Laure

- Kaplan, Lance M.; Hare, James Z. **Asymptotic Analysis of Uncertain Naive Bayes via Second-Order Probabilities**
- Li, Xiang; Deng, Xinyang; Jiang, Wen; Geng, Jie. **KN-RUE: Key Nodes based Resampling Uncertainty Estimation**
- Bernabeu, Joan M.; Ortega, Lorenzo; Blais, Antoine; Grégoire, Yoan; Chaumette, Eric. **On Time-Delay Estimation Accuracy Limit Under Phase Uncertainty**
- Sun, Wei; Tang, Xuning; Chang, Kuo-Chu. **Regression Model Bias Evaluation by Estimating Conditional Densities with Gaussian Mixtures**

**Decentralised and distributed fusion 1**  
*Decentralized Tracking and Knowledge Fusion*

Room: 10A

Chair: LeGrand, Keith

- Coraluppi, Stefano; Jenkins, Noah; Lexa, Michael. **Simplified Distributed Tracking**
- Ravier, Robert J.; Garagic, Denis; Galoppo, Travis; Jameson, Rex; Rhodes, Bradley J.; Zulch, Peter. **Constrain, Correspond, Correct: Distributed Game-Theoretic Data Association for Assignment Games on Multi-modal Sensing Grids**
- Li, Qing; Gan, Runze; Godsill, Simon. **Decentralised Gradient-based Variational Inference for Multi-sensor Fusion and Tracking in Clutter**
- Seyedmohammadi, S. Jamal; Atapour, S. Kawa; Abouei, Jamshid; Mohammadi, Arash. **KnFu: Effective Knowledge Fusion**
- Houssineau, Jeremie; Xue, Chenbao; Cai, Han; Uney, Murat; Delande, Emmanuel. **Decentralised multi-sensor target tracking with limited field of view via possibility theory**

## Wednesday, 10 July 2024. Late Afternoon Sessions. 15:50-17:30

### High-Level Fusion 2 *Oil Spill and Synthetic Data*

Room: 2A

Chair: Maresca, Salvatore

- 15:50 Sun, Qiankun; Chen, Chuang; Liu, Weifeng; Cai, Lei. **Bearing-based Multi-ASV Preset-time Oil Spill Surface Encirclement Control Method**
- 16:10 Duminil, Alexandra; Ieng, Sio-Song; Gruyer, Dominique. **Assessing fidelity in synthetic datasets: A multi-criteria combination methodology**
- 16:30 Lone, Jaffar Ali; Bhaumik, Shovan; Tomar, Nutan Kumar. **Functional Observer-Based Event-Triggered Control for Linear Discrete-time Descriptor Systems**
- 16:50 Svenson, Pontus; Holst, Anders; Wallberg, Anders; Nevalainen, Paavo; Farahnakian, Farshad; Álamo, Alfonso; Germinara, Vincenzo; Schweizer, Daniel; Leicht, Matthias; Anneken, Mathias; Hoppe, Adrian H.; Karalis, Aristeidis; Labib, Ashraf; Beltrán, Maria Eugenia; Hernández, Liss; Partanen, Petteri; Markkanen, Minna. **AI-ARC Baltic Demo: Detecting Illegal Activities at Sea**
- 17:10 Laudy, Claire; Museux, Nicolas; Fossier, Simon; Reverdy, Céline; Fougère, Tom; Audouy, Amandine; Lopez, Clara; Chenevier, Florent. **HLIF2024: a Competition for High-Level Information Fusion**

### Decentralised and distributed fusion 2 *Sensor Fusion Techniques*

Room: 5A

Chair: Mohammadi, Arash

- 15:50 Luo, Mingjie; Zhou, Jie; Zou, Qingke. **Multi-sensor Estimation Fusion Based on Kernel Mean Embedding**
- 16:10 Funk, Christopher; Noack, Benjamin. **Conservative Compression of Information Matrices using Event-Triggering and Robust Optimization**
- 16:30 Schmitt, Eva Julia; Noack, Benjamin. **Event-based Multisensor Fusion with Correlated Estimates**
- 16:50 Wang, Lili; Legrand, Keith A.; Sundaram, Shreyas. **Distributed Information Bayesian Recursive Update Filter**
- 17:10 Semeraro, Simone; Legrand, Keith A. **Gaussian Mixture Based Progressive Chernoff Fusion**

### Non-Bayesian Fusion Theory 2 *Cardinality-aware and SL Tracking*

Room: 3A

Chair: Ristic, Branko

- Sebbak, Faouzi; Senouci, Mustapha Reda. **Optimizing Cardinality-aware Combination Rules in Belief Functions Theory: an Enhanced Framework**
- Griebel, Thomas; Müller, Johannes; Buchholz, Michael; Dietmayer, Klaus. **Adaptive Kalman Filtering Based on Subjective Logic Self-Assessment**
- Geletu, Mihreteab Negash; Lauffenburger, Jean-Philippe; Josso-Laurain, Thomas; Devanne, Maxime; Wogari, Mengesha Mamo. **Evidential Deep Learning For Sensor Fusion**
- Ouattara, Koffi Ismael; Petrovska, Ana; Hermann, Artur; Trkulja, Natasa; Dimitrakos, Theo; Kargl, Frank. **On Subjective Logic Trust Discount for Referral Paths**
- Liu, Yueyang; Grayden, David B; Schmidt, Daniel; Soto-Breceda, Artemio; Cook, Mark J; Kuhlmann, Levin; Karoly, Philippa; Freestone, Dean R. **Forecasting events in multidimensional electroencephalographic brain data: Application to epileptic seizure prediction**

### AI for Fusion 6 *Machine Learning Optimization*

Room: 6A

Chair: Cominelli, Marco

- Harvey, Ryan; Braca, Paolo; Millefiori, Leonardo M.; Willett, Peter. **Sequential Hypothesis Testing Based on Machine Learning**
- Dezert, Jean; Shekhovtsov, Andrii; Salabun, Wojciech; Tchamova, Alben. **On Optimal Solution of the Compromise Ranking Problem**
- Zhang, Yuanhang; Lin, Zhidi; Sun, Yiyong; Yin, Feng; Fritsche, Carsten. **Regularization-Based Efficient Continual Learning in Deep State-Space Models**
- Shiri, Fatemeh; Moghimifar, Farhad; Hafari, Reza; Li, Yuan-Fang; Nguyen, Van; Yoo, John. **Decompose, Enrich, and Extract! Schema-aware Event Extraction using LLMs**

Room not in use

Room: 4A

Chair: Reuter, Johannes

- SS: **Extended Object and Group Tracking 4**  
*Extended Object Tracking and Shape Classification*
- Room: 7A
- Baur, Tim; Hoher, Patrick; Reuter, Johannes; Hanebeck, Uwe D. **Tracking Extended Objects with Basic Parametric Shapes using Deformable Superellipses**
- Hoher, Patrick; Baur, Tim; Reuter, Johannes; Griesser, Dennis; Govaers, Felix; Koch, Wolfgang. **3D-Extended Object Tracking and Shape Classification with a Lidar Sensor using Random Matrices and Virtual Measurement Models**
- Baerveldt, Martin; Shuai, Jiangtao; Brekke, Edmund Forland. **Improved Fusion of AIS Data for Multiple Extended Object Tracking**
- López, Michael Ernesto; Vasstein, Kjetil; Brekke, Edmund; Mester, Rudolf; Stahl, Annette. **A General Low-Parameter 3D Ship Hull Extent Model for Object Tracking**

### Target Tracking 4

#### Multi-Target Tracking Techniques

Room: 8A

Chair: Kropfreiter, Thomas

15:50 Wei, Xinwei; Lin, Yiru; Zhang, Linao; Zou, Zhiyuan; Wei, Jianwei; Yi, Wei. **Transformer-based Multi-Target Tracking with Bayesian Perspective**

16:10 Golias, Griffin; Nakura-Fan, Masa; Ablavsky, Vitaly. **SSP-GNN: Learning to Track via Bilevel Optimization**

16:30 Park, Hyunwoo; Chung, Hyeonjin; Conti, Andrea; Win, Moe Z.; Kim, Sunwoo. **Robust Near-field Beam Tracking via Deep Q-network for THz Communications**

16:50 Sætran, Ole Halvard; Rolfsjord, Sigmund. **Enhancing Predicted Distributions for Constant Acceleration and Turn Rate Motion Models: A Deep Learning Approach**

17:10 Mari, Marco; Snidaro, Lauro. **Ensemble of KalmanNets for Maneuvering Target Tracking**

### SS: Multi-modal Fusion for Assured Positioning, Navigation, and Timing (PNT) 3

#### Kalman Filter and UKF Applications

Room: 9A

Chair: Dunik, Jindrich; Kassas, Zak M.

Fan, Zhengyang; Shen, Dan; Bao, Yajie; Pham, Khanh; Blasch, Erik; Chen, Genshe. **RNN-UKF: Enhancing Hyperparameter Auto-Tuning in Unscented Kalman Filters through Recurrent Neural Networks**

Duník, Jindrich; Puncochár, Ivo; Král, Laislav; Straka, Ondrej; Daniel, Ondrej; Prol, Fabricio S.; Liaquat, Muwahida; Bhuiyan, Zahidul. **Multi-layer GNSS and LEO-PNT Positioning: Integrity under Constellations' Correlation**

Guo, Honggang; Liao, Zhikun; Liang, Zhonghong; Mu, Pengcheng; Yuan, Jie; Wang, Lin. **Kalman Filter State Transformation Application in INS/GNSS Integrated Navigation for Polar Navigation**

Vouch, Oliviero; Nardin, Andrea; Minetto, Alex; Zocca, Simone; Dosis, Fabio; Konitzer, Lauren; Parker, Joel J. K.; Ashman, Benjamin; Bernardi, Fabio; Tedesco, Simone; Fantinato, Samuele. **Bayesian Integration for Deep-Space Navigation with GNSS Signals**

### SS: Context-based Information Fusion

Room: 10A

Chair: García Herrero, Jesús; Snidaro, Lauro

Jose, Esther; Batta, Rajan; Sudit, Moises. **Situational Assessment using Indicator Kriging for Fleet Tracking and Prediction**

Rangel, Pablo; De Abreu Nunes, Vinícius Maravalhas; Da Rocha Salazar, Matheus; Simões, Reinaldo Albuquerque; Morgado De Castro Rosa, Luiza; Gomes De Carvalho Júnior, José. **A Hybrid Model for Detection and Classification of Fishing Activity: A Context-Based Approach**

Ramajo-Ballester, Álvaro; De La Escalera Hueso, Arturo; Armingol Moreno, José María. **Towards broader spatial-context 3D object detection for autonomous driving**

Zubasti Recalde, Pablo; Saiz Fernández, Mario; García Herrero, Jesús; Molina López, José Manuel. **Computer Vision-based road surveillance system using autonomous drones and sensor fusion**

## Gala Dinner. 19:30-24:00

Chair: Coraluppi, Stefano

Hotel Excelsior, via boat transfer. Included in paid registrations to the main conference

Boat boarding begins at 18:00

### Gala Dinner Speech (in-between courses)

Farina, Alfonso. *A Personal Journey in Radar Systems*

### Awards (dessert)

- 2023 IEEE AESS Early Career Award (Garcia Crespillo, Omar) – presented by Blair, Dale
- 2024 IEEE AESS Judith A. Resnik Space Award (Singla, Puneet) – presented by Blair, Dale
- 2024 ISIF Bar-Shalom Award – presented by Blair, Dale
- 2024 ISIF Young Investigator Award – presented by Blair, Dale
- 2024 IEEE Fellow (Gordon, Neil) – presented by Willett, Peter
- 2024 Tammy Blair Best Student Paper Awards – presented by Blasch, Erik and Willett, Peter
- 2024 Jean-Pierre Le Cadre Best Paper Awards – presented by Blasch, Erik and Willett, Peter
- 2024 5K Run Awards – presented by Dunham, Darin

### FUSION 2025 Announcement (coffee time)

Miceli de Farias, Claudio and Costa, Paulo



# Thursday, 11 July 2024

## Overview

### Main Conference

Various rooms. see below

08:40 Plenary

10:00 *Coffee break*

10:30 Late Morning Sessions

12:10 *Lunch served*

13:40 ISIF Forum

Room: 7A

15:00 ISIF Board

Room: 5A

Invitation only

19:30 Board Event

Invitation only

### Tour

Dorsoduro Area

08:45-12:00

Times are approximate. Please check the exact time and arrangements at the registration desk

Not included in the registration

## Plenary. 08:40-10:00

### Plenary

Chair: Vascon, Sebastiano

Aula Magna with Streaming to Room 5A

08:40 Snidaro, Lauro. **Organisers' announcements**

Greco, Sabrina - IEEE AESS President. **Welcome message**

09:00 Schön, Thomas. **Modelling and Generating Data via Deep Probabilistic Representations**

## Thursday, 11 July 2024. Late Morning Sessions. 10:30-12:10

### Resource and Sensor Management

[Room: 2A](#)

Chair: Belfadel, Djedjiga

- 10:30 Lee, Jongdeog; Lee, Jongkwan. **Text-based Voice Codec Algorithm for Tactical Radio Networks in Disconnected, Intermittent, Limited Environment**
- 10:50 Gommers, Daan; Strik, Dennis; Van Leijen, Vincent. **Making METOC data portable with video codecs**
- 11:10 Hao, Yuhang; Fu, Jing; Wang, Zengfu; Pan, Quan. **A Deep Reinforcement Learning-Based Whittle Index Policy for Multibeam Allocation**
- 11:30 Jiao, Hao; Zhang, Peng; Yan, Junkun; Dang, Xudong; Jiu, Bo; Liu, Hongwei. **Joint Beam Selection and Power Allocation for Multi-target Tracking in C-MIMO Radar Network**
- 11:50 Iacob, David-Octavian; Mikus, Philipp; Ospele, Matthias; Still, Luisa; Blonde-Weinmann, Cyril; Oispuu, Marc. **Optimizing Sensor Placement in Urban Environments for Time Difference of Arrival Shooter Localization and Event Classification**

### SS: Multiagent estimation

[Room: 5A](#)

Chair: Gao, Lin; Battistelli, Giorgio; Chisci, Luigi

- 10:30 Cros, Colin; Amblard, Pierre-Olivier; Prieur, Christophe; Da Rocha, Jean-François. **Split Covariance Intersection with Correlated Components for Distributed Estimation**
- 10:50 Li, Liangliang; Gao, Lin; Chisci, Luigi; Wei, Ping; Zhang, Huaguo; Farina, Alfonso. **Consensus-based distributed streaming coupled tensor factorization**
- 11:10 Di, Kuangyu; Li, Tiancheng; Li, Guchong; Song, Yan; Dang, Xudong. **Label Matching: It Is Complicated**
- 11:30 Zheng, Litao; Cai, Yunze; Yang, Feng; Shi, Lihong. **A Novel Distributed Bernoulli Filter with Adaptive Event-Triggered Communication**
- 11:50 Yang, Feng; Niu, Jingru; Shi, Lihong; Zheng, Litao. **Identification and Tracking of Multi-group Targets in Circular Formation under Multi-sensor Networks**

### Non-Bayesian Fusion Theory 3 *Multimodal Learning and Data Fusion*

[Room: 3A](#)

Chair: Kim, Du Yong

- Yang, Zhuo; Han, Deqiang; Yang, Yi; Dezert, Jean. **A Dual-threshold Based Evidential Openmax Approach for Open Set Recognition**
- Li, Wei; Han, Deqiang; Dezert, Jean; Yang, Yi. **Multimodal Coordinated Representation Learning Based on Evidence Theory**
- Dreo, Johann; Laudy, Claire; Lobentanzer, Sebastian; Baric, Marko; Gaydukova, Ekaterina; Schwikowski, Benno. **Reproducible Mapping of Tabular Data into Semantic Knowledge Graphs with OntoWeaver and BioCypher**
- Zhang, Mei; Shen, Xiaojing; Wang, Zhiguo; Varshney, Pramod K. **Robust Primal-Dual Proximal Algorithm for Cooperative Localization in WSNs**
- Adolfsson, Jonatan; Hamrell, Hanna; Gustafsson, David. **Tracking of Few-Pixel UAVs in Event Data**

### AI for Fusion 7

#### *Collaborative AI and Sensing*

[Room: 6A](#)

Chair: Rao, Nageswara

- De Gortari Briseno, Julian; Parac, Roko; Ardou, Leo; Roig Vilamala, Marc; Furelos-Blanco, Daniel; Kaplan, Lance; Mishra, Vinod K.; Cerutti, Federico; Preece, Alun; Russo, Alessandra; Srivastava, Mani. **TeamCollab: A Framework for Collaborative Perception-Cognition-Communication-Action**
- Cominelli, Marco; Gringoli, Francesco; Kaplan, Lance M.; Srivastava, Mani B.; Bihl, Trevor; Blasch, Erik P.; Iyer, Nandini; Cerutti, Federico. **Neuro-Symbolic Fusion of Wi-Fi Sensing Data for Passive Radar with Inter-Modal Knowledge Transfer**
- Somero, Michele; Urli, Federico; Snidaro, Lauro; Liani, Alessandro. **Defect detection MultiHeadAttention Fusion model on images acquired with different light sources**
- Urli, Federico; Somero, Michele; Snidaro, Lauro; Johnson, Chad; Vallisa, Tiziano; Visentini, Ingrid. **FeU-Net: overcomplete representations with large kernels for edge detection**
- Waxman, Daniel; Djuric, Petar M. **A Gaussian Process-based Streaming Algorithm for Prediction of Time Series With Regimes and Outliers**

### Classification and Identification

[Room: 4A](#)

Chair: LeGrand, Keith

- Zou, Qingke; Zhou, Jie. **Hyperspectral Super-Resolution Using Nonlinear Unmixing and Nonnegative Tensor Factorization**
- Li, Wei; Li, Xiaolong; Yang, Fan; Cui, Guolong; Yang, Xiaobo. **A Range Deception Interference Recognition and Target Detection Method Based on Coherent Fusion Processing for Multistatic Radar System**
- Zou, Zhiyuan; Miao, Qing; Wei, Jianwei; Lin, Yiru; Wei, Xinwei; Yi, Wei. **Trajectory Generation and Dynamic Continuous Activity Recognition for Radar Swarm Targets**
- Peng, Bohua; Chen, Bin; He, Wei; Thorne, William; Kadirkamanathan, Visakan. **Efficient Token Sparsification Through the Lens of Infused Knowledge**
- Tienin, Bole Wilfried; Cui, Guolong; Talla Nana, Yannick Abel; Ukwuoma, Chigoziem Chima; Mba Esidang, Roldan; Senouci, Mohammed Raouf. **FedRS-Net: A Federated Learning Approach for Collaborative Multi-Modal Maritime Analytics**

### Navigation

[Room: 7A](#)

Chair: Adams, Martin

- Chen, Chuang; Sun, Qiankun; Liu, Weifeng; Yan, Junkun. **A Smooth and Efficient Trajectory Planning Method for Unmanned Surface Vehicles**
- Ye, Shida; Bar-Shalom, Yaakov; Willett, Peter; Zaki, Ahmed. **Maximum Likelihood Identification of an Ornstein-Uhlenbeck Model and Its CRLB**
- Hellander, Anja; Hendeby, Gustaf. **On the feasibility of localization using DVB-T signals and combining TDOA and TWR measurements**
- Cavalcanti, Vinícius M. G. B.; Silva, Felipe O.; De Lima, Danilo A. **Genetic Algorithm-based Tunings for Baro-fused Inertial Navigation Systems**
- Venturino, Antonello; D'Afflisio, Enrica; Forti, Nicola; Braca, Paolo; Willett, Peter; Win, Moe Z. **Adaptive Resilience in Navigation: Multi-Spoofing Attacks Defence with Statistical Hypothesis Testing and Directional Receivers**

SS: Applications of Stone Soup

Room: 8A

Chair: Barr, Jordi M.; Thomas, Paul A.

- 10:30 Glover, Timothy J.; Nanavati, Rohit V.; Coombes, Matthew; Liu, Cunjia; Chen, Wen-Hua; Perree, Nicola; Hiscocks, Steven. **A Monte Carlo Tree Search Framework for Autonomous Source Term Estimation in Stone Soup**
- 10:50 Lyu, Chenyi; Liu, Xingchi; Wright, James; Barr, Jordi; Hunter, Alasdair; Mihaylova, Lyudmila. **Efficient Centralised and Decentralised Gaussian Process Approaches for Online Tracking within Stone Soup**
- 11:10 Dunič, Jindřich; Matousek, Jakub; Straka, Ondřej; Blasch, Erik; Hiles, John; Niu, Ruixin. **Stochastic Integration Based Estimator: Robust Design and Stone Soup Implementation**
- 11:30 Chong, Zhen Yuen; Pritchett, Henry; Li, Qing; Gan, Runze; Kindap, Yaman; Godsill, Simon. **Implementation of Non-Gaussian Motion Models Within Stone Soup**
- 11:50 Wright, James S.; Sun, Mengwei; Davies, Mike E.; Proudler, Ian K.; Hopgood, James R. **Implementation of AKKF-based Multi-Sensor Fusion Methods in Stone Soup**

SS: Information Fusion for situation understanding and sense-making

Room: 9A

Chair: Snidaro, Lauro; García Herrero, Jesús

- Incitti, Francesca; Salfinger, Andrea; Snidaro, Lauro; Challapalli, Sri. **Leveraging LLMs for Knowledge Engineering from Technical Manuals: A Case Study in the Medical Prosthesis Manufacturing Domain**
- Fan, Mengchen; Geng, Baocheng; Li, Keren; Wang, Xueqian; Varshney, Pramod K. **Interpretable Data Fusion for Distributed Learning: A Representative Approach via Gradient Matching**
- Fernandez-Matellan, Raul; Puertas-Ramirez, David; Martin Gomez, David; Boticario, Jesus G. **Fusion of Physiological Signals for Modeling Driver Awareness Levels in Conditional Autonomous Vehicles using Semi-Supervised Learning**
- Pieper, Fynn. **Sensor Fusion of 2D-LiDAR and 360-Degree Camera Data for Room Layout Reconstruction**
- Hare, James Z.; Liang, Yuchen; Kaplan, Lance M.; Veeravalli, Venugopal V. **On Network Quickest Change Detection with Uncertain Models: An Experimental Study**

Room not in use

Room: 10A

ISIF Forum. 13:40-14:40

Room: 6A

Chair: Hanebeck, Uwe; Maskell, Simon

Invitation-Only Events

ISIF Board. 15:00-18:00

Room: 10A

*Invitation only.*

Board Event. 19:30

*Invitation only.*