# 2nd iLoc Workshop
# High-integrity Localization for Automated Vehicles

**Sunday 24th September 2023, 14h00-19h00**

# Organizers

- Philippe Xu, Philippe Bonnifait
  University of Technology of Compiègne, France

- Javier Ibanez-Guzman
  Renault Group, France

- Steffen Schön, Claus Brenner
  Jingyao Su, Jeldrik Axmann
  Leibniz University Hannover, Germany

- Hao Cheng
  University of Twente, Netherlands

# Topics of interest

- Uncertainty propagation and updates while an AV drives in different environments.
- Novel algorithm and requirement definition for integrity, continuity, availability, and accuracy evaluation for intelligent transportation
- Map reference with its own integrity measure, including 2D digital map, high-definition map, 3D map/3D city model, even more precise survey map with both dynamic and static objects.
- Quantification and representation of the models' aleatoric (or statistical) and epistemic (or systematic) uncertainties for both environmental perception and localization.
- Uncertainty estimation of LiDAR point clouds registration and imagery data processing in e.g., probabilistic and deep learning-based models.
- State-of-the-art deep learning multi-modal data fusion for e.g., GNSS, LiDAR point clouds, images, 3D map localization information with integrity estimation.

# Session 1: 14h30 – 16h30

| Time | Speaker | Title |
|------|---------|-------|
| 14h30 – 15h00 | Dr. Scott Martin, Auburn University [Invited speaker] | Reliable RF Navigation in Degraded using Advanced Signal Processing |
| 15h00 – 15h30 | Prof. Justin Dauwels, TU Delft [Invited speaker] | Perception error modelling for autonomous driving |
| 15h30 – 15h50 | David Bétaille, Cyril Meurie, Yann Cocheril | Vision- and map-based non-line-of-sight satellites hybridized processing |
| 15h50 – 16h10 | Fabian Ruwisch, Steffen Schön | GNSS Feature Map Aided RTK Positioning in Urban Trenches |
| 16h10 – 16h30 | Jeldrik Axmann, Claus Brenner | Maximum Consensus based Localization and Protection Level Estimation using Synthetic LiDAR Range Images |

# Poster session: 16h30—17h30

| Authors | Title |
|---|---|
| Chen Zhu, Omar Garcia Crespillo, Daniel Gerbeth, Young-Hee Lee, Maximilian Simonetti, Wenhan Hao | Towards Navigation System Integrity for Urban Air Mobility – Concept Design and Preliminary Validation |
| Zekun Zhang, Penghui Xu, Guohao Zhang, Li-Ta Hsu | A Deep Learning Approach for GNSS-based Environment Detection in Urban Navigation |
| Anat Schaper, Steffen Schön | Multi-Agent Collaboration for High-Integrity Urban Navigation |
| Maxime Noizet, Philippe Xu, Philippe Bonnifait | Multi-sensor localization integrity for autonomous navigation of intelligent vehicles |
| Yunshuang Yuan, Hao Cheng, Michael Ying Yang, Monika Sester | Generating Evidential BEV Maps in Continuous Driving Space |

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# Session 2: 17h30 – 18h50

| Time | Speaker | Title |
|------|---------|-------|
| 17h30 – 18h00 | Enrique Dominguez, GMV [Invited speaker] | Multi-Sensor High Accuracy and Integrity Navigation in ERASMO Intelligent Vehicle |
| 18h00 – 18h30 | Bernd Kröper, KIT [Invited speaker] | Localization of Railway Vehicles using the Ferromagnetic Fingerprint of Rails |
| 18h30 – 18h50 | Elwan Héry, Philippe Xu, Philippe Bonnifait | A study of different observation models for cooperative localization in platoons |