Call for Papers

Journal of Advances in Information Fusion (JAIF)

Special Issue on Graph-Based Localization and Tracking

Localization and tracking are increasingly important capabilities in emerging applications including autonomous navigation, applied ocean sciences, asset tracking, future communication networks, and the internet of things. These applications pose new theoretical and methodological challenges due to the use of heterogeneous sensors and the corresponding need for data fusion, the implementation of collaborative and decentralized modes of operation, and the support of new inexpensive and low-power sensing devices. In particular, processing measurements provided by inexpensive devices is often complicated by uncertainties beyond Gaussian noise, like missed detections and clutter, an uncertain origin of measurements, and an unknown and time-varying number of objects to be localized or tracked.

Methodologically, these challenges can be well addressed by inference that leverages graphical models. The graph-based inference approach has important advantages regarding performance, scalability, versatility, and flexibility of implementation. It provides a powerful theoretical framework and a rich set of tools for modeling and exploiting the statistical structure of an inference problem. An inherent advantage of graph-based inference is that it can provide scalable solutions to high-dimensional problems. It also introduces lucidity and modularity into algorithm design, since different functional units of the overall problem appear as distinct parts in the graph. Due to these desirable properties, new graph-based modeling and inference techniques are advancing the field of localization and tracking. The general goal of the proposed special issue “Graph-Based Localization and Tracking” is to demonstrate the potential of graph-based inference for localization and tracking by presenting several concrete examples where this approach has been successfully applied. The featured papers address both theoretical and application-oriented aspects, including the following:

- Embedded particle flow
- Scalable data association
- Geoacoustic inversion
- Maritime situational awareness
- Simultaneous localization and mapping (SLAM)
- Autonomous driving
- Estimation of spatial fields
- Indoor localization
- Multiobject detection and tracking

The special issue is tentatively scheduled for June 2023. Extensions of good conference papers from Fusion 2022 (25th International Conference on Information Fusion) can be recommended for this special issue.

Guest Editors

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Timeline

1 Feb 2023 – submission deadline
1 Apr 2023 – 1st decision sent to authors
1 Jun 2023 – 1st revision deadline
1 Aug 2023 – 2nd decision sent to authors
1 Oct 2023 – 2nd revision deadline
1 Nov 2023 – final decision sent to authors
15 Nov 2023 – final manuscript deadline
Dec 2023 – publication JAIF Vol. 18(2)

Submissions

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