

Call for Papers Special Section on Visual SLAM

Aims and Scope

The field of Visual SLAM (Simultaneous Localization And Mapping) has progressed substantially since the last T-RO special collection in 2008. Visual SLAM has attained a consolidated level of maturity, finding applications in smartphones, AR/VR devices, and mobile robots. Despite this progress, many questions remain open, such as: Are current methodologies robust enough to handle outliers in data association effectively? Should the focus be on learning-based end-to-end approaches, classical methodologies, or hybrid strategies? What is the optimal map representation? 3D maps, NeRF, Gaussian Splatting, or alternatives? Can Visual SLAM leverage recent breakthroughs in Large Language Models and Foundation Models to enhance its capabilities?

This special collection invites contributions from researchers to present their latest advancements, propose solutions to open challenges and outline new avenues for research within the realm of Visual SLAM.

We encourage submissions related, but not limited, to the following topics:

- Robust SLAM
- Representations in SLAM (NeRF, Gaussian Splatting, etc.)
- Semantic, Object-level, and Dynamic SLAM
- Large Scale SLAM
- Unconventional vision sensors for SLAM (event cameras, thermal cameras)
- SLAM for Robotics Navigation
- Multi-agents SLAM
- Visual(-Inertial) Odometry
- Learning-based SLAM
- Beyond Conventional SLAM (Large Language Models, Foundation Models, ...)

We welcome top-quality original (unpublished) articles and review papers, following the [IEEE T-RO journal instructions for authors](#). Each submission will be peer-reviewed and the selection of papers will be based on their originality, impact, and relevance to the scope of the special collection. To ensure that all manuscripts are correctly identified for evaluation for the special section, please select “**Visual SLAM**” in the submission process.

Important Dates

- Submissions open: **June 15, 2024**
- Submissions close: **December 15, 2024**
- Expected publication date: 2025

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