

Advances in High Performance/Low Latency Simultaneous 3D Mapping, Localization and Tracking Technologies

Category: Software



Problems this Research Would Address

- It is difficult to **track many recent advancements** in the field of 3D mapping, localization and tracking that are emerging from research and could be maturing sufficiently to improve AR experience delivery
- **Shortage of detailed knowledge** of these developments prevents customers and technology providers from making informed decisions.
 - Without published industry requirements regarding device interoperability and documentation of accuracy, reliability and resilience **opportunities to use** 3D mapping, localization and tracking in AR projects, products or services **may be overlooked or not developed.**
 - Investments in 3D mapping hardware or software may not be fully leveraged if they are rapidly out of date, or inappropriate to target use cases or environments.

Whose problem would be addressed?

- **Enterprise decision makers** will be better able to make *informed choices* about use of limited resources when choosing hardware and software for internal AR projects and deployments
- **Providers of AR software or services** will be able to have better/productive discussions with technology partners, based on current and up-to-date information and to prioritize feature developments and have a roadmap for leveraging advances in simultaneous 3D mapping, localization and tracking.

How would this research be conducted?

1. Perform **desk research** to document latest advances in simultaneous 3D mapping, localization and tracking for AR and related fields. Identify those hardware or software providers that *measure and document 3D* localization **accuracy, reliability and resilience** in enterprise conditions.
2. **Perform analyses** on research findings to identify trends, top categories of opportunity and risk, and document these in a report
3. **Compile samples** (videos and running code in public GitHub repositories) and instructions for their use (including any hardware) that members can follow to test and evaluate new algorithms (including open source)
4. **Develop a decision support tool** for members to assess if/where there are suitable options for simultaneous 3D mapping, localization and tracking technologies emerging from research for use in enterprise AR deployments or products and services

Project Deliverables

- **Report of research findings** describing current state of the art and future trends in clearly defined categories/segments of AR pipeline and ecosystem, including but not limited to latest research publications and centers, emerging companies/businesses, tech giants. Which providers are leading the way WRT performance (benchmarks) and publishing results?
- **Sample content and open libraries** with instructions for their use to measure (benchmark) and evaluate emerging new algorithms
- **Decision support tool for members** to use when identifying the most suitable options for introducing advanced simultaneous 3D mapping, localization and tracking technologies in existing or new projects
- **Executive summary** of findings for public release and **member exclusive webinar**

Benefits to AREA Members

- **Increased knowledge**, awareness and insights into the latest simultaneous 3D mapping, localization and tracking technologies, trends to watch and how to use these will permit better informed decisions and investments
- Through identification of **use case and requirements**, use of a tool will narrow down the different technologies to those best suited to meet the enterprise AR conditions
- **Identification of potential technology partners** that will differentiate future products and services by way of high performance/low latency 3D mapping, localization and tracking.
- Provides an opportunity for AREA members to lead the market in defining the creation of benchmarks and documentation of performance (accuracy, reliability and resilience).