From SLAM to Spatial AI

Andrew Davison

Imperial College London, UK

Abstract

To enable the next generation of smart robots and devices which can truly interact with their environments, Simultaneous Localisation and Mapping (SLAM) will progressively develop into a general geometric and semantic `Spatial AI' perception capability. Spatial AI algorithms will be built from estimation and learning elements, and key issues are how these components can be used and trained together as we continue to search for the best long-term scene representations to enable intelligent interaction.

To enable the performance and efficiency required by real products, computer vision algorithms must be developed together with the sensors and processors which form full systems, and I will cover research on vision algorithms for non-standard visual sensors such as event cameras as well as concepts for the longer term future of coupled algorithms and architectures.

Finally, I will discuss the evaluation and benchmarking of Spatial AI systems, and argue for a broader set of performance measures than are currently usual.