Thrun / Montemerlo

FastSLAM

A Scalable Method for the Simultaneous Localization and Mapping Problem in Robotics

This monograph describes a new family of algorithms for the simultaneous localization and mapping problem in robotics (SLAM). SLAM addresses the problem of acquiring an environment map with a roving robot, while simultaneously localizing the robot relative to this map. This problem has received enormous attention in the robotics community in the past few years, reaching a peak of popularity on the occasion of the DARPA Grand Challenge in October 2005, which was won by the team headed by the authors. The FastSLAM family of algorithms applies particle filters to the SLAM Problem, which provides new insights into the data association problem that is paramount in SLAM. The FastSLAM-type algorithms have enabled robots to acquire maps of unprecedented size and accuracy, in a number of robot application domains and have been successfully applied in different dynamic environments, including the solution to the problem of people tracking.

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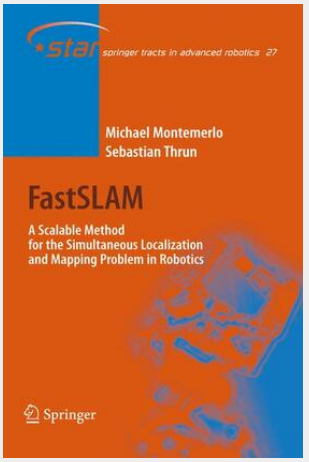

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