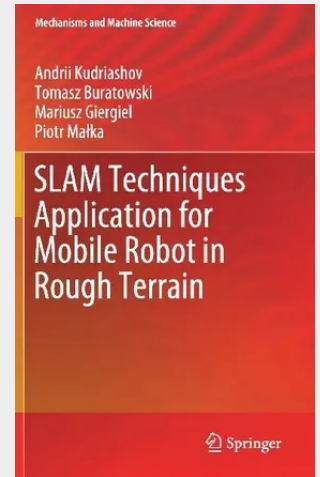


SLAM Techniques Application for Mobile Robot in Rough Terrain

This book presents the development of SLAM-based mobile robot control systems as an integrated approach that combines the localization, mapping and motion control fields, and reviews several techniques that represent the basics of the mathematical description of wheeled robots, their navigation and path planning approaches, localization and map creating techniques. It examines SLAM paradigms and Bayesian recursive state and map estimation techniques, which include Kalman and particle filtering, and enable the development of a SLAM-based integrated system for the inspection task performed. The system's development is divided into two phases: a single-robot approach and multirobot inspection system. The book describes an original approach to 2D SLAM in multi-floor buildings that covers each 2D level map, as well as continuous 3D pose tracking, and views the multirobot inspection system as a group of homogeneous mobile robots. The last part of the book is dedicated to multirobot map creation and the development of path planning solutions, which allow the robots' homogeneous behavior and configuration to be used to develop a multirobot system without theoretical limitations on the number of robots used.

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