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Global Buffers; 4.5 Summary; References; 5. Sensors; 5.1 Transforming Sensor Readings; 5.1.1 Partitioning: Single Robot Location; 5.1.2 Analysis; 5.1.3 Partitioning: Multiple Robot Locations; 5.1.4 Analysis; 5.2 Drawing a Map from Sonar Data; 5.2.1 Finding Straight Lines with the Hough Transform; 5.2.2 Partitioning; 5.2.3 Program Design; 5.2.4 Analysis; 5.2.5 Load Balanced Hough Calculation; 5.2.6 Analysis; 5.3 Aligning Laser Scan Measurements
5.3.1 Polar Scan Matching; 5.3.2 Partitioning and Analysis; 5.3.3 Program Design; 5.4 Summary; References; 6. Mapping and Localization; 6.1 Constructing a Spatial Occupancy Map; 6.1.1 Probabilistic Sonar Model; 6.1.2 Bayesian Filtering; 6.1.3 Partitioning by Map; 6.1.4 Program Design; 6.1.4.1. Phase 1; 6.1.4.2. Phase 2; 6.1.4.3. Phase 3; 6.1.4.4. Phase 4; 6.1.5 Analysis; 6.1.6 Partitioning by Sensor Readings; 6.1.7 Program Design; 6.1.8 Analysis; 6.2 Monte-Carlo Localization; 6.2.1 Partitioning; 6.2.2 Program Design; 6.2.3 Analysis; 6.2.4 Improving the Serial Fraction; 6.3 Summary; References
7. Vision and Tracking; 7.1 Following the Road; 7.2 Iconic Image Processing; 7.2.1 Partitioning; 7.2.2 Program Design; 7.2.3 Analysis; 7.2.4 Spatial Pixel Operations; 7.2.5 Partitioning; 7.2.6 Program Design; 7.3 Multiscale Image Processing; 7.3.1 Partitioning; 7.4 Video Tracking; 7.4.1 Spatial Histograms; 7.4.2 Condensation; 7.4.3 Partitioning; 7.4.4 Program Design; 7.5 Summary; References; 8. Learning Landmarks; 8.1 Landmark Spatiograms; 8.2 K-Means Clustering; 8.2.1 Partitioning; 8.2.2 Program Design; 8.2.3 Analysis; 8.3 EM Clustering; 8.3.1 Partitioning; 8.3.2 Program Design; 8.3.3 Analysis
8.4 Summary

Sommario/riassunto

In this book, we look at how cluster technology can be leveraged to build better robots. Algorithms and approaches in key areas of robotics and computer vision, such as map building, target tracking, action selection and landmark learning, are reviewed and cluster implementations for these are presented. The objective of the book is to give professionals working in the beowulf cluster or robotics and computer vision fields a concrete view of the strong synergy between the areas as well as to spur further fruitful exploitation of this connection. The book is written at a level appropriate for a
