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Matching; 1.6 Multi-Camera Geometry; 1.6.1 Affine Reconstruction; 1.6.2 Projective Reconstruction; 1.6.3 Metric Reconstruction; 1.6.4 Bundle Adjustment; 1.7 Conclusions; 1.7.1 Resources; References; Chapter 2. Multi-View Calibration, Synchronization, and Dynamic Scene Reconstruction; 2.1 Introduction; 2.2 Camera Network Calibration and Synchronization; 2.2.1 Epipolar Geometry from Dynamic Silhouettes; 2.2.2 Related Work; 2.2.3 Camera Network Calibration; 2.2.4 Computing the Metric Reconstruction; 2.2.5 Camera Network Synchronization; 2.2.6 Results; 2.3 Dynamic Scene Reconstruction from Silhouette Cues; 2.3.1 Related Work; 2.3.2 Probabilistic Framework; 2.3.3 Automatic Learning and Tracking; 2.3.4 Results and Evaluation; 2.4 Conclusions; References; Chapter 3. Actuation-Assisted Localization of Distributed Camera Sensor Networks; 3.1 Introduction; 3.2 Methodology; 3.2.1 Base Triangle; 3.2.2 Large-Scale Networks; 3.2.3 Bundle Adjustment Refinement; 3.3 Actuation Planning; 3.3.1 Actuation Strategies; 3.3.2 Actuation Termination Rules; 3.4 System Description; 3.4.1 Actuated Camera Platform; 3.4.2 Optical Communication Beaconing; 3.4.3 Network Architecture; 3.5 Evaluation; 3.5.1 Localization Accuracy; 3.5.2 Node Density; 3.5.3 Latency; 3.6 Conclusions; References; Chapter 4. Building an Algebraic Topological Model of Wireless Camera Networks; 4.1 Introduction; 4.2 Mathematical Background; 4.2.1 Simplicial Homology; 4.2.2 Example; 4.2.3 Čech Theorem; 4.3 The Camera and the Environment Models; 4.4 The CN-Complex; 4.5 Recovering Topology: 2D Case; 4.5.1 Algorithms; 4.5.2 Simulation in 2D; 4.6 Recovering Topology: 2.5D Case; 4.6.1 Mapping from 2.5D to 2D; 4.6.2 Building the CN-Complex; 4.6.3 Experimentation; 4.7 Conclusions; References; Chapter 5. Optimal Placement of Multiple Visual Sensors; 5.1 Introduction; 5.1.1 Related Work; 5.1.2 Organization; 5.2 Problem Formulation; 5.2.1 Definitions; 5.2.2 Problem Statements; 5.2.3 Modeling a Camera's Field of View; 5.2.4 Modeling Space; 5.3 Approaches; 5.3.1 Exact Algorithms; 5.3.2 Heuristics; 5.3.3 Random Selection and Placement; 5.4 Experiments; 5.4.1 Comparison of Approaches; 5.4.2 Complex Space Examples; 5.5 Possible Extensions; 5.6 Conclusions; References; Chapter 6. Optimal Visual Sensor Network Configuration; 6.1 Introduction; 6.1.1 Organization

Sommario/riassunto

The first book, by the leading experts, on this rapidly developing field with applications to security, smart homes, multimedia, and environmental monitoring Comprehensive coverage of fundamentals, algorithms, design methodologies, system implementation issues, architectures, and applications Presents in detail the latest developments in multi-camera calibration, active and heterogeneous camera networks, multi-camera object and event detection, tracking, coding, smart camera architecture and middleware This book is the definitive reference in multi-camera