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Autore	Dubuisson Severine
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2.3.3.1. Multimodal tracking; 2.3.3.2. Multifragment tracking; 2.3.3.3. Multiappearance tracking; 2.4. Conclusion; 3: Tracking Models That Focus on the State Space; 3.1. Introduction; 3.2. Data association methods for multi-object tracking; 3.2.1. Particle filter with adaptive classification; 3.2.2. Energetic filter for data association; 3.3. Introducing fuzzy information into the particle filter; 3.3.1. Fuzzy representation; 3.3.2. Fuzzy spatial relations; 3.3.3. Integration of fuzzy spatial relations into the particle filter; 3.3.3.1. Application to tracking an object with erratic movements; 3.3.3.2. Application to multi-object tracking; 3.3.3.3. Application to tracking shapes; 3.4. Conjoint estimation of dynamic and static parameters; 3.5. Conclusion; 4: Models of Tracking by Decomposition of the State Space; 4.1. Introduction; 4.2. Ranked partitioned sampling; 4.3. Weighted partitioning with permutation of sub-particles; 4.3.1. Permutation of sub-samples; 4.3.2. Decrease the number of resamplings; 4.3.3. General algorithm and results; 4.4. Combinatorial resampling; 4.5. Conclusion; 5: Research Perspectives in Tracking and Managing Large Spaces; 5.1. Tracking for behavioral analysis: toward finer tracking of the "future" and the "now"; 5.2. Tracking for event detection: toward a top-down model; 5.3. Tracking to measure social interactions; Bibliography; Index

Sommario/riassunto

This title concerns the use of a particle filter framework to track objects defined in high-dimensional state-spaces using high-dimensional observation spaces. Current tracking applications require us to consider complex models for objects (articulated objects, multiple objects, multiple fragments, etc.) as well as multiple kinds of information (multiple cameras, multiple modalities, etc.). This book presents some recent research that considers the main bottleneck of particle filtering frameworks (high dimensional state spaces) for tracking in such difficult conditions.
