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Nota di contenuto	Information Fusion in Signal and Image Processing; Table of Contents; Preface; Chapter 1. Definitions; 1.1. Introduction; 1.2. Choosing a definition; 1.3. General characteristics of the data; 1.4. Numerical/symbolic; 1.4.1. Data and information; 1.4.2. Processes; 1.4.3. Representations; 1.5. Fusion systems; 1.6. Fusion in signal and image processing and fusion in other fields; 1.7. Bibliography; Chapter 2. Fusion in Signal Processing; 2.1. Introduction; 2.2. Objectives of fusion in signal processing; 2.2.1. Estimation and calculation of a law a posteriori 2.2.2. Discriminating between several hypotheses and identifying 2.2.3. Controlling and supervising a data fusion chain; 2.3. Problems and specificities of fusion in signal processing; 2.3.1. Dynamic control; 2.3.2. Quality of the information; 2.3.3. Representativeness and accuracy of learning and a priori information; 2.4. Bibliography;

Chapter 3. Fusion in Image Processing; 3.1. Objectives of fusion in image processing; 3.2. Fusion situations; 3.3. Data characteristics in image fusion; 3.4. Constraints; 3.5. Numerical and symbolic aspects in image fusion; 3.6. Bibliography

Chapter 4. Fusion in Robotics4.1. The necessity for fusion in robotics; 4.2. Specific features of fusion in robotics; 4.2.1. Constraints on the perception system; 4.2.2. Proprioceptive and exteroceptive sensors; 4.2.3. Interaction with the operator and symbolic interpretation; 4.2.4. Time constraints; 4.3. Characteristics of the data in robotics; 4.3.1. Calibrating and changing the frame of reference; 4.3.2. Types and levels of representation of the environment; 4.4. Data fusion mechanisms; 4.5. Bibliography; Chapter 5. Information and Knowledge Representation in Fusion Problems

5.1. Introduction5.2. Processing information in fusion; 5.3. Numerical representations of imperfect knowledge; 5.4. Symbolic representation of imperfect knowledge; 5.5. Knowledge-based systems; 5.6. Reasoning modes and inference; 5.7. Bibliography; Chapter 6. Probabilistic and Statistical Methods; 6.1. Introduction and general concepts; 6.2. Information measurements; 6.3. Modeling and estimation; 6.4. Combination in a Bayesian framework; 6.5. Combination as an estimation problem; 6.6. Decision; 6.7. Other methods in detection; 6.8. An example of Bayesian fusion in satellite imagery

6.9. Probabilistic fusion methods applied to target motion analysis6.9.1. General presentation; 6.9.2. Multi-platform target motion analysis; 6.9.3. Target motion analysis by fusion of active and passive measurements; 6.9.4. Detection of a moving target in a network of sensors; 6.10. Discussion; 6.11. Bibliography; Chapter 7. Belief Function Theory; 7.1. General concept and philosophy of the theory; 7.2. Modeling; 7.3. Estimation of mass functions; 7.3.1. Modification of probabilistic models; 7.3.2. Modification of distance models

7.3.3. A priori information on composite focal elements (disjunctions)

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## Sommario/riassunto

The area of information fusion has grown considerably during the last few years, leading to a rapid and impressive evolution. In such fast-moving times, it is important to take stock of the changes that have occurred. As such, this books offers an overview of the general principles and specificities of information fusion in signal and image processing, as well as covering the main numerical methods (probabilistic approaches, fuzzy sets and possibility theory and belief functions).

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