Ionescu / Quénot / Benois-Pineau

Fusion in Computer Vision

Understanding Complex Visual Content

This book presents a thorough overview of fusion in computer vision, from an interdisciplinary and multi-application viewpoint, describing successful approaches, evaluated in the context of international benchmarks that model realistic use cases. Features: examines late fusion approaches for concept recognition in images and videos; describes the interpretation of visual content by incorporating models of the human visual system with content understanding methods; investigates the fusion of multi-modal features of different semantic levels, as well as results of semantic concept detections, for example-based event recognition in video; proposes rotation-based ensemble classifiers for high-dimensional data, which encourage both individual accuracy and diversity within the ensemble; reviews application-focused strategies of fusion in video surveillance, biomedical information retrieval, and content detection in movies; discusses the modeling of mechanisms of human interpretation of complex visual content.

Visual content understanding is a complex and important challenge for applications in automatic multimedia information indexing, medicine, robotics, and surveillance. Yet the performance of such systems can be improved by the fusion of individual modalities/techniques for content representation and machine learning. This comprehensive text/reference presents a thorough overview of Fusion in Computer Vision, from an interdisciplinary and multi-application viewpoint. Presenting contributions from an international selection of experts, the work describes numerous successful approaches, evaluated in the context of international benchmarks that model realistic use cases at significant scales. Topics and features: examines late fusion approaches for concept recognition in images and videos, including the bag-of-words model; describes the interpretation of visual content by incorporating models of the human visual system with content understanding methods; investigates the fusion of multi-modal features of different semantic levels, as well as results of semantic concept detections, for example-based event recognition in video; proposes rotation-based ensemble classifiers for high-dimensional data, which encourage both individual accuracy and diversity within the ensemble; reviews application-focused strategies of fusion in video surveillance, biomedical information retrieval, and content detection in movies; discusses the modeling of mechanisms of human interpretation of complex visual content. This authoritative collection is essential reading for researchers and students interested in the domain of information fusion for complex visual content understanding, and related fields.
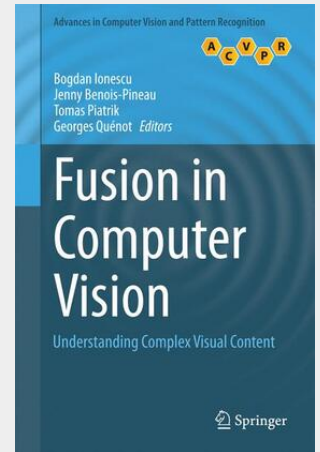
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