Editorial

Introduction to computer vision and image understanding the special issue on video analysis

This special issue of the Computer Vision and Image Understanding (CVIU) offers a venue to present innovative approaches in video analysis, which have been changing our everyday life dramatically over the last few years. Below we present the origin of this issue and then give an overview of the papers included.

With the explosive growth of video data, video analysis techniques have become more and more important in the field of computer vision and image understanding and other related areas. Video analysis techniques have great potential applications in multimedia, human computer interface, surveillance, copyright protection, and so on. The challenges that exist in video analysis research include motion analysis, video semantic understanding, and abnormal event detection. Many of these challenges can be addressed through the theories of pattern recognition and artificial intelligence. For example, the Markov chain Monte Carlo sampling has been successfully applied for video tracking and motion analysis; techniques such as support vector machines and boosting in machine learning have been widely used for video classification and retrieval; graph-based statistical learning techniques have achieved success in moving object segmentation and video clustering; and the semi-supervised learning methods have found much application in image and video editing.

In recent years, video analysis has been given much more attention, and many literatures have been published in conferences, such as CVPR, ICCV, ACM Multimedia, etc. The goals of this special issue are: (1) filling the need of a comprehensive overview of the new approaches; (2) developing novel techniques to target specific problems in video analysis and (3) designing novelty video application systems for our life. The target audience of this special issue includes researchers and engineers related to video analysis.

This special issue attracted a record number of 28 paper submissions. From these 28 papers, 10 were accepted. We strongly believe that it is now an ideal time to publish this special issue with the aforesaid selected papers. The contents will provide readers of CVIU with cutting-edge and topical information for their related research.

Below we give an overview of the papers included.

This special issue starts from the motion analysis, which is studied by two papers (Attention from Motion: A Factorization Approach for Detection Attention Objects in Motion) (Dynamic Shape Outlier Detection for Human Locomotion), after which Object Tracking is studied (Object Tracking Using SIFT Features and Mean Shift). Thereafter, in Video Clustering, two schemes are presented in two papers (Unsupervised View and Rate Invariant Clustering of Video Sequences) (Discriminative Optical Flow Tensor for Video Semantic Analysis). Following that, an effective video annotation algorithm is provided (Semi-Supervised Kernel Density Estimation for Video Annotation). After that, two papers in video retrieval are respectively presented for object discovery and near-duplicate detection (Video Retrieval Based on Object Discovery) (Visual Word Proximity and Linguistics for Semantic Video Indexing and Near-Duplicate Retrieval). The last session of this special issue focuses on applications (A Framework for Flexible Summarization of Racquet Sports Video Using Multiple Modalities) (Fast Analysis of Scalable Video for Adaptive Browsing Interface).

In summary, we would like to thank authors for their continuous efforts and enduring patience as this issue came together. We would also like to thank the CVIU Editor-in-Chief Prof. A.C. Kak, for his constant and significant support. Moreover, we also acknowledge the support from the Elsevier colleagues, and finally, we would like to express our deepest appreciation to all anonymous referees who responsibly and effectively reviewed the special issue submissions. Without their timely and important assistance, it is impossible to handle these 28 submissions and finalize this high-quality special issue in vision analysis as scheduled.

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Available online 8 December 2008