北京大学信息工程学院学术讲座

Vision, Learning and Applications for Defined Object Detection

Speaker:
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Abstract:
The ability to detect defined objects (e.g: pedestrians, Vehicle and boat) are the first important step in many computer vision applications such as video surveillance. In this talk, I will give a comprehensive overview of our research outcomes in vision and learning for these defined object detections. I will present an experimental study on pedestrian detection using state-of-the-art local feature extraction and boosting based classifiers. The performance of pedestrian detection using different features including region covariance, histogram of oriented gradients (HOG) Local Binary Pattern feature descriptors are experimentally evaluated. The experiments are performed on both the benchmarking datasets and recorded videos for our research project. Building upon the findings of our experiments for pedestrian detection, I will introduce some simpler pedestrian detectors using combined simple features and the covariance features. Unlike the work in other references, where the feature selection and weak classifier training are performed on the Riemannian manifold, we select features and train weak classifiers in the Euclidean space for faster computation. A set of demo will be shown to link our research to many applications including vehicle, boat and human detection. As a conclusion, I will show some practical algorithms that can be used in surveillance system in real time.

Short Bio:
Dr. Jian Zhang received the BSc. degree from East China Normal University, Shanghai, China, in 1982; the MSc. degree in computer science from Flinders University, Adelaide, Australia, in 1994; and the Ph.D. degree in electrical engineering from the University of New South Wales (UNSW), Sydney, Australia, in 1999. From 1997 to 2003, he was with the Visual Information Processing Laboratory, Motorola Labs, Sydney, as a Senior Research Engineer, and later became a Principal Research Engineer and a Foundation Manager with the Visual Communications Research Team. From 2004 to July 2011, he was a Principal Researcher and a Project Leader with National ICT Australia, Sydney, and a Conjoint Associate Professor with the School of Computer Science and Engineering, UNSW. He is currently an Associate Professor with the Advanced Analytics Institute, School of software, Faculty of engineering and Information Technology, University of Technology Sydney, Sydney. Dr. Zhang's research interests include multimedia signal processing, computer vision, pattern recognition, visual information mining, human-computer interaction and intelligent video surveillance systems. Apart from more than 100 paper publications, book chapters, patents and technical reports from his research output, he was co-author of more than ten patents filed in US, UK, Japan and Australia including six issued US patents.
Dr. Zhang is an IEEE Senior Member. He was Technical Program Chair, 2008 IEEE Multimedia Signal Processing Workshop; Associated Editor, IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT) and Associated Editor, EURASIP Journal on Image and Video Processing. Dr Zhang was Guest Editor of T-CSVT for Video Technology for Special Issue (March 2007) of the Convergence of Knowledge Engineering Semantics and Signal Processing in Audiovisual Information Retrieval. As a General Co-Chair, Jian chaired the International Conference on Multimedia and Expo (ICME 2012) in Melbourne Australia 2012

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