

# COMPUTER SCIENCE SEMINAR SERIES

Department of Computer Science  
City University of Hong Kong  
(Departmental Seminar Seminar 2007/2008 - No 14)

## Near-Duplicate Keyframe Identification With Interest Point Matching and Pattern Learning

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<b>Date :</b>	23 November 2007 (Friday)
<b>Time :</b>	11:30am - 12:30pm
<b>Venue</b>	CS Seminar Room, Rm Y6405, 6th Floor Yellow Zone, Academic Building, City University of Hong Kong, Tat Chee Avenue, Kowloon Tong.

### Abstract

This paper proposes a new approach for near-duplicate keyframe (NDK) identification by matching, filtering and learning of local interest points (LIPs) with PCA-SIFT descriptors. The issues in matching reliability, filtering efficiency and learning flexibility are novelly exploited to delve into the potential of LIP-based retrieval and detection. In matching, we propose a one-to-one symmetric matching (OOS) algorithm which is found to be highly reliable for NDK identification, due to its capability in excluding false LIP matches compared with other matching strategies. For rapid filtering, we address two issues: speed efficiency and search effectiveness, to support OOS with a new index structure called LIP-IS. By exploring the properties of PCA-SIFT, the filtering capability and speed of LIP-IS are asymptotically estimated and compared to locality sensitive hashing (LSH). Owing to the robustness consideration, the matching of LIPs across keyframes forms vivid patterns that are utilized for discriminative learning and detection with support vector machines. Experimental results on TRECVID-2003 corpus show that our proposed approach outperforms other popular methods including the techniques with LSH in terms of retrieval and detection effectiveness. In addition, the proposed LIP-IS successfully speeds up OOS for more than 10 times and possesses several favorable properties compared to LSH.

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Supervisor: Dr C W Ngo (CS)  
Research Interest: Image Annotation, Multimedia Information Retrieval, Computer Vision and Pattern Recognition

**All are welcome!**

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*In case of questions, please contact Dr C W Ngo at Tel: 2784 4390, E-mail: [cscwngo@cityu.edu.hk](mailto:cscwngo@cityu.edu.hk), or visit the CS Departmental Seminar Web at <http://www.cs.cityu.edu.hk/>.*