香港浸會大學理學院
HKBU Faculty of Science

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DEPARTMENT OF COMPUTER SCIENCE

PhD Degree Oral Presentation

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Time:	20 August 2013 (Tuesday) 2:30 pm – 4:30 pm (35 mins presentation and 15 mins Q & A)
Venue:	SCT909, Cha Chi Ming Science Tower, HSH Campus

"Dependency Modeling for Information Fusion with Applications in Visual Recognition"

Abstract

While many pattern recognition algorithms have been developed in the last forty years, classifying images/videos in practical applications still faces the challenges of self/mutual occlusions, clustered backgrounds, illumination variations, etc. In order to improve the recognition performance, many systems are designed by fusing multiple complementary features for various classification tasks. This thesis addresses the independent assumption issue in the fusion process and proposes two novel frameworks for dependency modeling.

The first approach models the feature dependency by a linear combination of the posterior probabilities under some mild assumptions. Removing the assumptions in the first method, the second dependency modeling approach is developed based on probabilistic properties by analytic function. Since feature extraction is an important step in the fusion process, a new manifold learning based feature extraction method is proposed for video classification.

The proposed methods have been extensively evaluated on publicly available databases such as PASCAL VOC 2007, Columbia Consumer Video, Hollywood Human Action, etc., and give convincing results. In short, the major contributions of this thesis are summarized as follows.

- A linear dependency modeling framework is developed for classifier level and feature level fusion.
- A Reduced Analytic Dependency Model (RADM) is derived for score level fusion with less demanding assumption.
- A Supervised Spatio-Temporal Neighborhood Topology Learning (SSTNTL) method is proposed for video classification applications.

***** ALL INTERESTED ARE WELCOME *****