

DISSERTATION INFORMATION

Title : Method for knowledge representation based on algebraic approach

Major : Computer Science

Major code : 62.48.01.01

Ph.D student: Tran Son Hai

Advisor : Assoc. Prof. Le Hoang Thai - Prof. Nguyen Thanh Thuy

University : University of Informatio Technology, VNU-HCM;

I. ABSTRACT

Image classification is a significant problem in computer vision. Image classification system is widely used in many real applications such as identification, image tracking, image retrieval, ... This is not only interesting for scientific, but also for industrial applications.

This dissertation proposed a novel model for image classification combining multiple features (handcraft features or deep features). The proposed model has been applied for many applications with the specific dataset. The proposed image classification model consist 3 layers:

- (1) Single classification layer: Classifying the input image based on separate image features.
- (2) Transfer module: Finding the relationship of the classification results of single classification layer.
- (3) Integration layer: Combining the classification results to identify the final classification result.

The proposed multi-layer models has been applied in some real applications, foerexample:

- (1) Flower image classification.
- (2) Facial expression classification.
- (3) Burning image classification.
- (4) Advertisement image classification.
- (5) X-ray chest image classification.

II. THE MAIN CONTRIBUTIONS OF THE DISSERTATION

The main contributions of the dissertation are summarized as follows:

- (1) Firstly, this dissertation proposed multi-layer image classification based on late-fusion approach. It consists 3 layers: Single classification layer, transfer module, integration layer. The single classification layer consists m classifiers responding to m feature vectors of the input image. Transfer module finds the relationship of the classification results in single classification layer. Integration layer make the final classification decision by combining m classification results.
- (2) Secondly, this dissertation applied the proposed multi-layer model for classifying images based on handcraft features, for example, MANN, ANN-KNN, ANN-SVM, and Multi-SVM model.
- (3) Thirdly, this dissertation applied the proposed multi-layer model for classifying images based on deep features. This dissertation has been combined multi-CNN features for some applications, such as, burning image classification, advertisement image detection, and abnormal X-ray chest detection.

Advisor

PhD. Student

Assoc. Prof. Le Hoang Thai

Prof. Nguyen Thanh Thuy

Tran Son Hai