

Derived Kernel based Method and its Applications

by

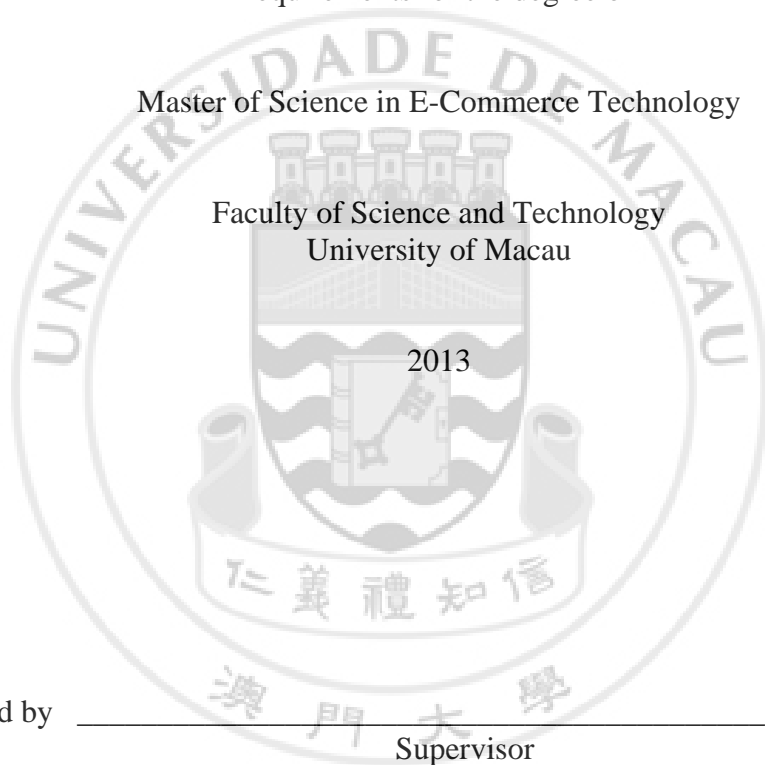
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Date _____

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Abstract

DERIVED KERNEL BASED METHOD AND ITS
APPLICATIONS

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In this thesis, the up-to-date method based on derived kernel and neural response was introduced which was a hierarchical learning method and led to an effective feature extraction and similarity measure in the area of object recognition, handwriting classification, and contour categorization. For a better description of its advantages, some other current algorithms were introduced and compared. The key process of derived kernel based method consist of image pre-processing, image function preliminaries (i.e., nested patches definition, image patches transformation, image function definition, and image function restriction), neural response process, template selection and construction, and classification.

Considering the important roles of templates during the whole process of derived kernel based method, some new ideas combined with intelligent learning algorithms were proposed for templates selection for the sake of improving recognition accuracy and cutting down time consumption. Based on the advantages of this method, some new ideas of applications were proposed (i.e., license plate recognition, and vehicle type recognition), and the related adjustment and development would be made for the specific problem requirements. On both applications, some methods to process original images were employed for decreasing noises and image differences. The First-Nearest Neighbor classification algorithm was also adapted to fit in our method in the process of related objects recognition.

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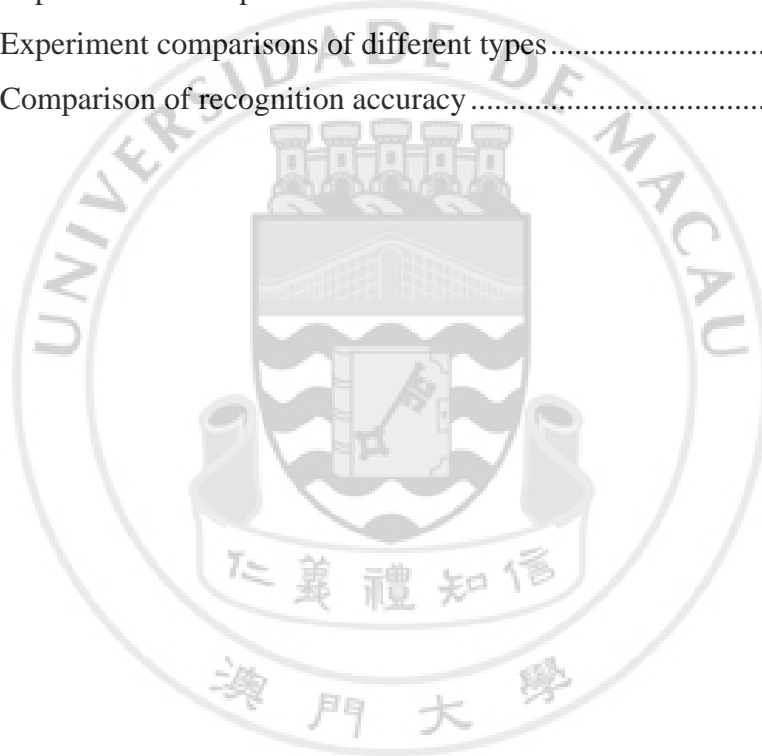


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GLOSSARY

WEKA is a collection of machine learning algorithms for data mining tasks. It contains tools for data pre-processing, classification, regression, clustering, association rules, and visualization. It is also well-suited for developing new machine learning schemes.



LIST OF ABBREVIATIONS

DK. Derived Kernel

LPR. License Plate Recognition

NN. Neural Network

BoW. Bag-of-Words

MMR. Make and Model Recognition



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