ENHANCING ARABIC OCR USING DEEP NEURAL NETWORKS AND ONE-SHOT LEARNING APPLIED TO EGYPTIAN LICENSE PLATES

By

Ghada Abd El-Rahman Sokar

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
Computer Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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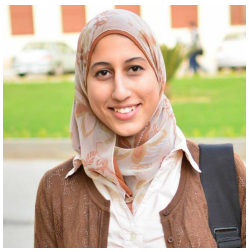

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Title of Thesis:

Enhancing Arabic OCR using Deep Neural Networks and One-Shot Learning Applied to Egyptian License Plates

Key Words:

Arabic OCR; License plate recognition; Character recognition; Deep neural networks; One-shot classification

Summary:

Arabic character recognition is an important process that can be used in many applications. However, little attention is given to Arabic domain. The previous proposed techniques for isolated characters depend on either template matching technique or hand-crafted features. These techniques are not suitable for complex domains and can not generalize well to different datasets with different characteristics. Therefore, we introduce two deep neural network models: stacked auto-encoder and convolution neural network. The models are tested on recognizing characters of Egyptian license plates. We proposed another siamese neural network model. This model is used as a generic feature extractor module for one-shot classification task. The model is trained using certain classes and can be used in classifying new classes without retraining the model. Our proposed one-shot system aims at overcoming the challenges that face Arabic character recognition using the power of deep neural networks.

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Dedication

I dedicate this thesis to my family for their endless support during my work.

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