



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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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.

Table of Contents

Acknowledgements	i
Dedication	ii
List of Tables	v
List of Figures	vi
List of Symbols and Abbreviations	viii
Abstract	ix
1 Introduction	1
1.1 Overview	1
1.2 License Plate Recognition Systems	2
1.2.1 Egyptian license plates	2
1.3 Challenges	3
1.4 Thesis Objective	7
1.5 Organization of the thesis	8
2 Background	9
2.1 Neural Networks	9
2.2 Learning Procedure of Neural Networks	9
2.3 Deep Neural Networks	11
2.4 Convolution Neural Networks	12
2.5 Siamese Neural Network	13
3 Literature Review	15
3.1 Arabic License Plate Recognition	15
3.1.1 Related Work	15
3.2 Arabic OCR	20
3.2.1 Related Work	20
4 Arabic OCR Using Deep Neural Nets	23
4.1 System Overview	23
4.2 Pre-processing Phase	23
4.2.1 Image Analysis	24
4.2.2 Image Enhancement	25
4.2.3 Conversion to Binary Images	28
4.2.4 Image Enhancement and Validation	29
4.2.5 Image Normalization	29
4.2.6 Summary	30
4.3 Recognition Phase	30
4.4 Character Recognition Using Stacked AutoEncoder	31

4.4.1	Pre-training Phase	32
4.4.2	Fine-tuning Phase	34
4.4.3	Learning Procedure	35
4.4.4	Classification	37
4.5	Character Recognition Using Convolution Neural Network	38
4.5.1	Network Architecture	38
4.5.2	Learning procedure	38
4.6	Character Recognition Using One-Shot Classification Model	40
4.6.1	Building Feature Extractor Module Using Deep Convolution Siamese NN	41
4.6.2	One-Shot Classification	43
4.6.3	Generalization to Different Domains	45
5	Experimental Results	47
5.1	LP DataSet	47
5.1.1	Dataset Construction	47
5.2	Performance Evaluation of Deep NN Models	50
5.3	Performance Evaluation of One-Shot Classification Model	54
5.3.1	One-Shot Classification Results of Egyptian License Plates	54
5.3.2	One-Shot Classification Results of Handwritten Datasets	55
5.3.2.1	One-Shot Classification Results of Eastern-Arabic Hand- written Digits	56
5.3.2.2	One-Shot Classification of Farsi Handwritten Digits	58
5.3.2.3	One Shot Classification of Hindu-Arabic Handwritten Digits	60
6	Conclusion and Future Work	63
6.1	Conclusion	63
6.2	Future Work	64
	References	66
	Appendix A AppendixA	72
A.1	Derivative of the cross-entropy cost function for the softmax function	72