Arabic Handwritten Word Recognition using Deep Convolutional Neural Networks

Shahad Abdullah Alghamdi, Lama Adel Boubshait, Reem Ali AL Sadiq
Computer Science Students, Prince Mohammad bin Fahd University

Introduction

Design of a system that recognize handwritten Arabic words written by children aging between 7-10 years old. This project is intended to transform Arabic handwritten words to its digital form to provide the correct writing and then grade it accordingly. The project will depend heavily on the fundamentals of machine learning using deep learning techniques.

The system will accept an image of a handwritten word as an input, process it using the deep learning techniques, provide the correct writing of it and then grade the word accordingly. The challenge was collecting the dataset of handwritten Arabic words written by children.

Methodology & Tools

- Initial Experiments are performed using typical Feature Extraction method as well as Deep Learning Approaches
- In typical experiments, geometrical features as extracted and classification is performed using Support Vector Machines, Random Forest, Naïve Bayes.
- In Deep Learning approaches, Convolutional Neural Networks and Residual Networks are used.
- We got average 85% accuracy but working further to improve the results as project will be completed next year.

Objectives

The aim of this project is to improve the learning experience for children who are beginning to learn writing and provide a tool that aids teachers and parents in grading and evaluating their children's performance in writing.

Dataset

- A new dataset consist of 60 unique words each word is repeated 600 time is build.
- Obtained from volunteer students ages 7-12

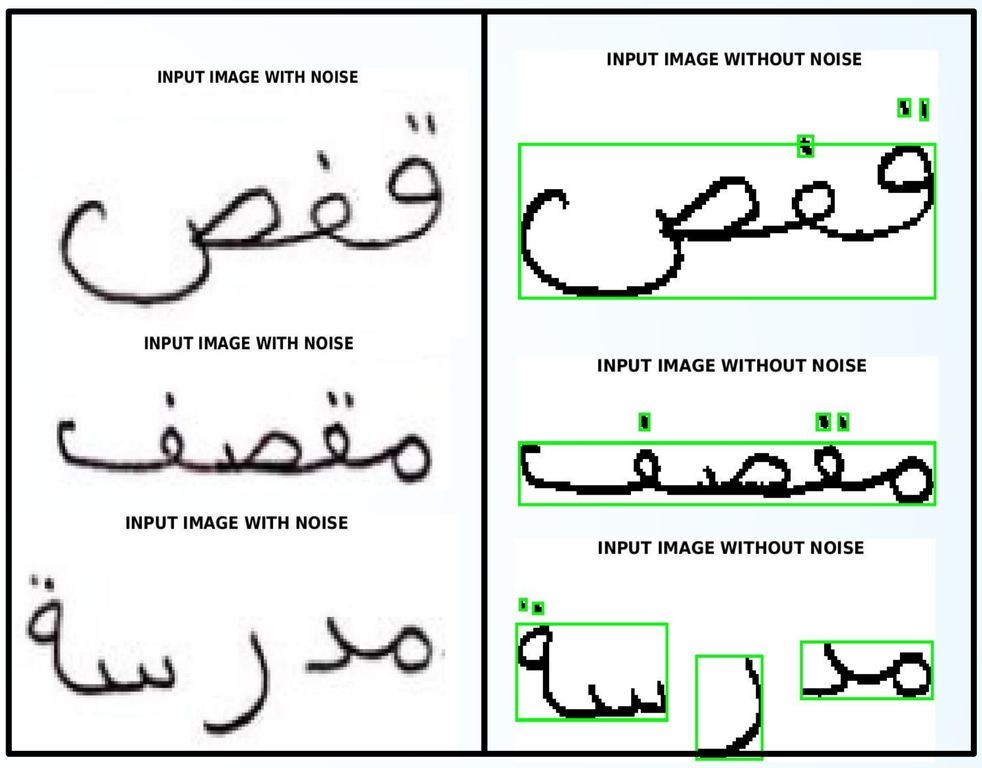

Image Segmentation & Extraction

Project Potential

- Once this project is completed it can be considered as a valuable resource for further research purposes and project improvements related to handwritten word/text recognition in general

Research Project Advisor:
Dr. Ghazanfar Latif, Dr. Jaafar Alghazo,
Faculty, College of Computer Engineering and Sciences,
Prince Mohammad bin Fahd University, Al-Khobar, Saudi Arabia