CMP450 – Semester 20/21

Text Independent Writer Recognition Using LBPH & SVM

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Team #1

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***Abstract*—**

I. Introduction

II. Pipeline

III. Preprocessing Module

IV. Feature Extraction Module

V. Classification Module

VI. Performance Analysis

VII. Speed Enhancements

We put alot of effort on speeding up the training process. The most effective optimization was parallelizing the feature extraction by extracting each image's features in a seperate process and then collecting all the features before training.

Processes are quite heavy, but python threads are totally useless, thanks to `GIL`'s locking mechanism. We believe that if we port the code to another language, the execution time would be much lower using threads and manual memory allocation.

Python lists are known to be very slow, so we replaced them all with numpy arrays, and allocated most of the needed memory ahead before all training. A quite speed gain came from fine tuning `skimage` and `OpenCV` parameters.

We tried to use `Numba` and `Cython` to optimize the execution time but they didn't have an effect. It was probably becaue most of the code calls numpy, `skimage` and `OpenCV`, which are all written in C and well optimized for memory and cpu.

VIII. Unsuccessful Trials

IX. Future Work

X. Workload Distribution

A. *Mahmoud Othman Adas*

- TODO

B. *Yosry Mohamed Yosry*

- TODO

C. *Ahmad Mahmoud AbdElMen'em Afifi*

- TODO

D. *Abdulrahman Khalid Hassan*

- TODO

XI. Conclusion