



PARALLELIZING AwSpPCA FOR ROBUST FACIAL
RECOGNITION USING CUDA

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and

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Bachelors in
Science Degree

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THESIS APPROVAL

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This is to certify that thesis is a presentation of our original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions.

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Abstract

This paper was conducted to analyze the performance benefits of parallelizing the Adaptive Weighted Sub-patterned Principle Component Analysis (Aw SP PCA) algorithm, given that the algorithm is implemented so as to retain the accuracy from its serialized version. The serialized execution of this algorithm is analyzed first and then compared against its parallel implementation, both compiled and run on the same computer. Throughout this paper, the methodology is to undergo a step by step procedure which can clearly outline and describe the problems faced when trying to parallelize this algorithm. It will also describe where, how and why parallelizing procedures were used.

The results of the research have shown that while not all parts of the algorithm can be implemented in parallel in the first place, some of the sections that can be parallelized does not necessarily yield a considerable amount of benefits. Also, it was seen that not all sections scale well with problem size, meaning that some portions of the algorithm can be left in its serialized state without much loss in time. The sections which can be parallelized were discussed in detail. Some changes were also made to certain variables to ensure the best accuracy possible. Finally, through analysis and experimentation, a speedup of 2.76 was achieved, with a recognition accuracy of 92.6%.

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