Speeding up Fuzzy *k*-Means Clustering Algorithm by GPUs

Dinh Trung Vu

Department of Computer Science and Engineering

National Taiwan Ocean University

Keelung, Taiwan 202

R. O. C.

ABSTRACT

The graphics hardware is becoming increasingly more powerful and programmable with the introduction of Graphics Processing Units (GPU) like the NVidia GeForce series. The GPU’s exceed the ordinary general purpose CPU’s ability to do ﬂoating point operations due to the massively parallel architecture in the GPU’s.

With the newest GPU’s one actually have enough programmable freedom to do other computations than computer graphics processing. This project will take advantage of this in order to get high performance implementations of image analysis algorithms.

In this project we will implement an image analysis algorithm, which is Fuzzy k-Means Clustering Using m nearest Cluster Centers [1], on a GPU. We will also make comparisons with CPU based implementations and analysis the pros and cons of using GPU’s in image analysis.

REFERENCES

[1] Franklin J. C. Lai , Eric Y. T. Juan, and Jim Z. C. Lai, Generalized Fuzzy k-Means Clustering Using m nearest Cluster Centers, 2013.