GPU-Parallel Implementation of Color based Medical Image Retrieval in Compressed Domain

Abstract

In huge databases Image processing takes more time for execution on a single core processor because of slow single thread algorithms. Graphics Processing Unit (GPU) is more popular now-a-days due to their speed, programmability, low cost and more inbuilt execution cores in it. Most of the researchers started work to use GPUs as a processing unit with a single core computer system to speedup execution of algorithms. The main goal of this research work is to parallelize the process of content based image retrieval through color in compressed domain making whole process much faster than normal. In this paper, parallel implementation is focused on the well known Quadratic Distance metric approach for Color based image retrieval systems, since it is one of the most fundamental and important problems in the field of computer vision, medical image processing and content based image retrieval (CBIR). For compressed images we have taken standard JPEG format. Our work employs extensive usage of highly multithreaded architecture of multi-cored GPU. An efficient use of shared memory is required to optimize parallel reduction in Compute Unified Device Architecture (CUDA). Experimental results show that parallel implementation achieved an average speed up of 25 x over the serial
implementation when running on a GPU named GeForce 9500 GT having 32 cores. Color based retrieval method of CBIR is also evaluated using Recall, Precision, F-measure, True Negative rate, and Accuracy evaluation measures.

Reference

- Padmashri Suresh ,RMD.Sundaram Aravindhan Arumugam, “ Feature Extraction in Compressed Domain for Content Based Image Retrieval”, International Conference on Advanced Computer Theory and Engineering, 10.11.09
Index Terms

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Key words

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