



The Summer Undergraduate Research Fellowship (SURF) Symposium
6 August 2015
Purdue University, West Lafayette, Indiana, USA

GPU/CPU Performance of Image Processing Tasks for use in the CAM² System

Jonathan H. Cottom, Young-Sol Koh, Yung-Hsiang Lu
Department of Electrical and Computer Engineering, Purdue University

ABSTRACT

Over the past several years, graphics processing units (GPU) have increasingly been viewed as the future of image processing engines. Currently, the Continuous Analysis of Many CAMeras (CAM²) project performs its processing on CPUs, which will potentially be more costly as the system scales to service more users. This study seeks to analyze the performance gains of GPU processing and evaluate the advantage of supporting GPU-accelerated analysis for CAM² users. The platform for comparing the CPU and GPU performance has been the NVIDIA Jetson TK1. The target hardware implementation is an Amazon cloud instance, where final cost analysis will be performed. It is expected that the GPU will outperform its CPU counterpart in some image processing applications. The degree to which it outperforms the CPU is subject to a number of factors. So far, tests have shown the expected speedup (and lack thereof) in basic mathematical operations performed on the GPU, indicative of the expected success of the integration into the CAM² system.

KEYWORDS

GPU, image processing, parallel computing