

Structured Abstract with Key Images

Context

With the increasing use of cloud technologies, there is a need to find more information to enhance efficiency and further reduce cost and power. This can be done through performance evaluation using data analysis.

Objective

This project aims to extract information from the dataset created from the application checkpoint and system metric output from a production of a terapixel image to pinpoint the area on which optimization should be focused.

Method

The data was provided by Newcastle University and was created during the use of 1024 GPU nodes for terapixel image processing. It was wrangled, with exploratory data analysis done using Python in jupyter notebook along with the use of GitHub for version control.

Result

To summarize the findings, it can be said that the GPU uses most of its time in rendering compared to other events (tiling, uploading, saving configuration). It is the most important task for the GPU.

Task assignment to GPU does need some improvements for spreading out the load on GPU but the GPU utilization percentage was still on average near 90%, although its interquartile range was stretched. Another thing was that GPU memory utilization, which is a very important factor for bottlenecks, was very low. It might be because resources were not needed, but it could also be that they were not utilized properly.

Novelty

This project provides insight into GPU performance for terapixel rendering. It is based on CRISP-DM methodology. The project can be served as basis for future scalability projects or modeling enhancements on the data.

Key Images

