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 study examines and analyses the performance of Terapixel rendering in super computers. By keeping an eye on each host's power draw, it is easy to identify which servers are consuming the most power.Then, steps could be taken to reduce their use or swap them out for more energy-efficient ones.

Method

The information was supplied by Newcastle University and was compiled as a result of the utilisation of 1024 GPU nodes for the processing of terapixel images. It was cleaned up by performing exploratory data analysis using Python in jupyter notebooks and utilising GitHub as the repository for version control..

Result

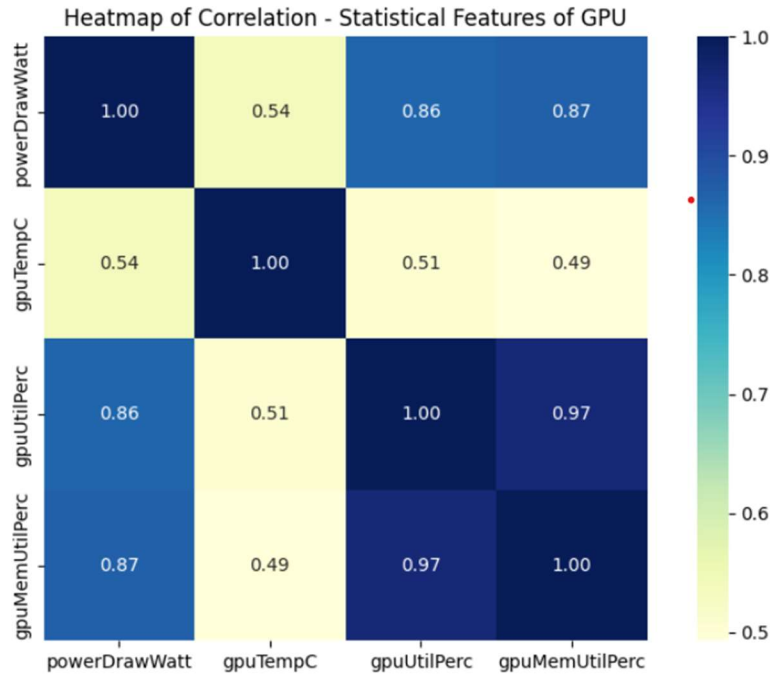
In conclusion, it can be stated that rendering takes up the majority of the GPU's time in comparison to other events (such as tiling, uploading, and saving configuration), which was discovered during the research. It is the most essential work for the graphics processing unit (GPU).

Although there is room for improvement in the task assignment to GPU in order to more evenly distribute the load among GPUs, the GPU utilisation percentage was still very close to 90% on average, despite the fact that its interquartile range was expanded. Another thing that was quite low was GPU memory utilisation, which is a very essential criterion for determining bottlenecks. It's possible that resources weren't used effectively because nobody needed them, but it might equally be because nobody used them at all.

Novelty

This study offers valuable information into the performance of GPUs when rendering at terapixel resolution. It uses the CRISP-DM approach as its foundation. This project has the potential to serve as a foundation for other scalability initiatives in the future or modelling improvements based on the data.

Key Images



Correlation coefficient value