CSC8634_TeraScope Report

Morgan Frodsham (210431461)

10/01/2022

#Extended Technical Project: Performance Evaluation of Terapixel Rendering in Cloud (Super)computing

##Business Understanding

###Background

Newcastle University has created a scalable architecture for cloud-based visualisation of data collected by the Newcaslte Urban Observatory; they have demonstrated it is feasible to produce a high quality terapixel visualisation using a path tracing renderer in under a day with public IaaS cloud GPU nodes (Forshaw (2021)). This project sits at the intersection of Data Science, Cloud Computing, and performance evaluation research, and focuses on the performance evaluation for a computation of a terapixel visualisation of the city of Newcastle upon Tyne and its environmental data.

[Insert wider context from reading]

###Business Objectives and Successs Criteria

###Data Mining Goals

Which event types dominate task runtimes? What is the interplay between GPU temperature and performance? What is the interplay between increased power draw and render time? Can we quantify the variation in computation requirements for particular tiles? Can we identify particular GPU cards (based on their serial numbers) whose performance differs to other cards? (i.e. perpetually slow cards). What can we learn about the efficiency of the task scheduling process?

###Benefits

Include resources, requirement, risks, terminology, cost and benefits

###Plan

Include plan plus initial assessment of tools and techniques

##Data Understanding

###Collect Inital Data

Newcastle University has provided three data sets created from application checkpoint and system metric output for the production of a terapixel image (Forshaw (2021)).

###Describe Data

###Explore Data

###Verify Data Quality

##Data Preparation

###Select Data

###Clean Data

###COnstruct Data

###Integrate Data

###Format Data

##Modeling

##Evaluation

###Evaluate Results

###Review Process

###Determine Next Steps

#Deployment

Forshaw, Matthew. 2021. *Summary*. https://github.com/NewcastleDataScience/StudentProjects202122/blob/master/TeraScope/Summary.md.