

Terascope Terapixel Deployment: Computational Analysis

Mark R. Tyrrell¹

¹) Newcastle University
m.r.tyrrell2@newcastle.ac.uk

Context: The visualisation of multiscale urban data accessible on low cost thin client devices offers increasing benefits in many contexts including urban planning and disaster management. Distributed super computing makes this possible by outsourcing pixel rendering to cloud resources.

Objective: Newcastle University's recently deployed Terascope Terapixel project provides an interesting opportunity to analyse performance of such a system in order to further understanding of the underlying computational processes.

Method: Data produced by the rendering operation documenting the various phases of the process were analysed using statistical methods. Interpretable, reproducible research methodologies were used to produce the analysis.

Results: This analysis demonstrated the intense computational requirements of rendering images to the terapixel level. The deployment of 1024 GPUs across the Azure cloud provided a flexible and economical approach to this computation.

Novelty: Findings from the analysis of this process will inform future deployments and provide a solid analytical basis from which to design a benchmarking methodology.

Figure 1: Relative Pixel Generation Execution Performance



Figure 2: Execution Time by GPU Enviromental and Resource Metrics

