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Creating and Optimizing a Sky Tessellation Algorithm for Direction-Dependent effects

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With the promise of the SKA comes multiple challenges in terms of capturing and cleaning the data. One part of this involves breaking up or tessellating an image so that it can be cleaned of noise for better analysis. While methods to do this are currently in circulation, more can be done to ensure the results are as accurate as possible and are obtained as quickly as possible.

This research seeks to improve the current best tessellation model for correcting the noise and do so in an optimal way with specialised hardware. To achieve these aims a novel algorithm is created and tested to generate the tessellation more effectively than the current best model. In order to increase the calculation speeds, part of this algorithm is then parallelised for processing on a GPU.

The tessellation algorithm generated for this research is more effective than the current best model in general. Through accelerating parts of the algorithm on a GPU, speed-ups of up to 39.96x are obtained for tessellations generated from 1000 data sources.

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Yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

Hons

Main supervisor (name and email)
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Yes

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