Harry Waugh

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Profile

A driven, ambitious and rounded graduate from the University of Bristol, with a particular interest in High Performance Computing and Computer Graphics.

Education

BSC COMPUTER SCIENCE (1ST CLASS) | 2016 - 2019 | UNIVERSITY OF BRISTOL

- Dissertation 71% - Using Sensor Fusion and Deep Learning to Improve Activity Tracking
- Advanced High Performance Computing 80% - (3rd Year Unit) Optimization with OpenMP, MPI, OpenCL and MPI+OpenCL.
- Computer Graphics 82% - (3nd Year Unit) Created a 'Real-Time' Raytracer with OpenCL, GLM and SDL.
- Applied Security 87% - (3rd Year Unit) Developed an AES-128 implementation and a Differential Power Attack.

A2/AS LEVELS (A* - B) | 2015 - 2016 | RICHARD HUISH COLLEGE, TAUNTON

- A2 Mathematics (A*), A2 Further Mathematics (A), A2 Computing (B), AS Physics (B)

11 GCSE (A* - B) | 2009 - 2014 | THE CASTLE SCHOOL, TAUNTON

- Including A* in Mathematics, and A English Language

Experience

INTERN |ADVANCED COMPUTING RESEARCH CENTRE |MAY 2019 - PRESENT

- Responsible for identifying bottlenecks within scientific codes, and then applying techniques to improve performance.
- Routinely created jobs with slurm and PBS, and experimented with a variety of tools such as TAU, Intel Amplifier and CrayPAT.
- Evaluated the performance of Phylogenetics code, PhyloBayes-MPI, on both Intel and ARM systems. Optimized the code to achieve over a 2x speedup, and wrote a comprehensive report on the code's current performance along with any future improvements.
- Currently optimizing the Met Office's NAME code (Dispersion Model) to run on ARM systems, to determine whether these achieve similar performance to their Intel counterparts.

MATHS TUTOR | BRISTOL TUTORS |ST MARY REDCLIFFE SCHOOL | FEBRUARY 2017 - MAY 2019

- Organised engaging lesson plans, and taught students in preparation for their GCSEs.

PROJECTS

- **Sensor Fusion.** Research project looking at how GPS activity tracking can be improved by utilizing a phone's accelerometer. Implemented a Kalman Filter and a GRU neural network using tensorflow and Keras. Key Technologies: Python, Numpy, Tensorflow.
- **Lattice Boltzmann (LBM)** Applied serial and parallel optimizations to an LBM code. Care was taken to align arrays in memory and ensure that loops vectorized, before developing MPI and OpenMP implementations to further increase performance. The code was also optimized using OpenCL to exploit the superior memory bandwidth of a GPU. Key Technologies: C, MPI, OpenMP, OpenCL.
- **Raytracer** This project involved building a Real-Time Raytracer from scratch using OpenCL, GLM and SDL. The raytracer was used to render the Cornell Box, with reflection and refraction phenomena being showcased on spheres and other objects. The realism of the rendered image was further improved using anti-aliasing and soft shadows. Key Technologies: C++, OpenCL, GLM.

Skills & Abilities

- Programming Languages and Scripting- Proficient in C, Java. Experience in Python, C++ and Bash.
- Worked with a number of web technologies: Spring Boot, Thymeleaf, NodeJS, Pug.js.
- Ran and came 8th in the Dartmoor 50 Mile Ultramarathon, highlighting self-discipline to train and work hard every day, alongside my drive to never give up.

References

PROF. S MCINTOSH-SMITH | BRISTOL UNIVERSITY

- Email: S.McIntosh-Smith@bristol.ac.uk

DR. G WILLIAMS | ACRC

- Email: Gethin.Williams@bristol.ac.uk