CompBioMed
A Centre of Excellence in Computational Biomedicine

e-Seminar Series

e-Seminar #22
Tools and techniques for making efficient use of GPUs

17 March 2022 3pm CET / 2pm GMT (2h duration)

Register for free here: https://register.gotowebinar.com/register/2376790517365313035

The goal of this session is to provide an overview of some of the technologies, tools and techniques available to ensure the efficient use of GPUs for high performance computing.

The session will be split into two components: firstly, we will look at programming GPUs and some of the technologies available to minimise bottlenecks both within and across nodes. This will include using standard language features to programme for GPUs (C++, Fortran), directives-based approaches such as OpenACC or OpenMP, Unified Memory, and an overview of GPUDirect for optimising the communications pipelines. In addition, some tools for scientific visualisation of data will be presented.

Secondly, the focus will shift to how to make use of profiling tools to analyse GPU accelerated applications to identify bottlenecks and ensure optimal performance. Specifically, there will be a demo of both the Nsight Systems (system-level analysis) and the Nsight Compute (GPU kernel analysis) profiling tools with a worked code example.

This is the 22nd in a series of online e-Seminars organised by CompBioMed.

Watch the full series at www.compbiomed.eu/training!

Paul Graham is a Senior Solutions Architect at NVIDIA, where he has responsibility for supporting customers and partners in delivering accelerated solutions for the Higher Education and Research, High Performance Computing and AI communities in the UK. Previously he spent 20 years working at EPCC, the supercomputing centre at the University of Edinburgh, where he worked on a broad range of academic and industrial projects porting and optimising code.

Robert Dietrich is a Senior System Software Engineer at NVIDIA with over ten years of experience in high-performance computing. He co-developed performance-analysis tools for parallel applications such as Score-P and Vampir. After graduating at the TU Dresden, he worked on the standardization of tool interfaces in OpenACC and OpenMP, and earned his PhD in performance analysis of scalable applications on heterogeneous system architectures. Before joining the NVIDIA Nsight Systems developer team, Robert engaged in research on cluster-level monitoring and analysis.

Felix Schmitt is a Senior Software Engineer in NVIDIA's Developer Tools team. He is developing a range of performance analysis and correctness checking tools, including Nsight Compute. Before joining NVIDIA, he was working as a research associate investigating novel performance analysis tools and techniques. He holds a Master's degree in Computer Science from Dresden University of Technology, Germany.

NVIDIA

Moderated by Tim Weaving, **UCL**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 823712.

Organised in collaboration with: VPH Institute
Building the Virtual Physiological Human