![Hartree Centre - Science & Technology Facilities Council]

Advancing simulation of the inferior olivary nucleus

The Hartree Centre's access programmes provide free access to leading-edge high performance computing hardware.

Challenge

The National Technical University of Athens (NTUA) are meeting the challenge of simulating a demanding neuronal model using the Hartree Centre's Intel® Xeon Phi™ coprocessor cluster. Due to their experiments' size, complexity and need for biophysical accuracy, this has previously only been attempted with simpler neuronal models.

Outcome

The NTUA believe that providing efficient tools to the neuroscientific community for simulation of regions of the human brain will lead to important discoveries about how the brain works. This, in turn, will lead to improvements in health longevity and quality of life but will also give a broader sense of how a human being operates. It was imperative they had access to Intel® Xeon Phi™ architecture for their research so the access programme was ideal. The neuronal model had already been ported to GPUs and the results obtained have left a lot to be desired. The Intel® Xeon Phi™ is closer to a single-node, many-core, super-processor than a GPU, providing an interesting alternative.

Next steps

NTUA's partnership with the Hartree Centre will continue for the forseeable future thanks to the EU2020-funded Vineyard project. They will further develop a framework for neuron modelling across various high performance platforms available at the Hartree Centre.

www.hartree.stfc.ac.uk

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Conference papers

- **ACM International Conference on Computing Frontiers**
- **IEEE International Symposium on Performance Analysis of Systems and Software**

Publications

- **IEEE/ACM Transactions on Computational Biology and Bioinformatics (submittted, under review)**

Partner organisations

- **National Technical University of Athens (NTUA)**

Principal researchers

- **George Chatzikonstantis, PhD student**
- **Dimitrios Rodopoulos, PhD**
- **Dimitrios Soudris, Associate Professor**

Want to get involved?

Contact us to request an application form for our next Intel® Xeon Phi™ access programme.

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