

Vacation projects for Summer 2016

Project supervisor email address *

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Title and objective of the project *

"Integration of the meshing capabilities of the Manchester Thermal Analyser."

The Manchester Thermal Analyser (MTA) is a CAD tool for simulating the thermal integrity of integrated circuits. It is based on a combination of the finite element method and circuit equations. In the finite element part a physical domain of interest, over which a mathematical equation is defined, needs to be subdivided into non-overlapping subdomains, called the elements. Then a local approximation of the equation is constructed on each of the elements. The domain subdivision into elements is done prior to simulation using third-party software packages. Since the computational speed is of essence in design tools for integrated circuits, it is required to integrate tightly the mesh generation and the simulation engine. The objective of this project is to provide a wrapper class, written in C++, to facilitate this coupling.

Start date, end date, total duration (weeks) *

13/06/2016, 19/08/2016, (10 weeks)

The benefit to the School *

The Manchester Thermal Analyser is in a development phase, but once functional, can be used as a demonstration tool in School Open days to attract potential students interested in software engineering, algorithms, and numerical analysis methods.

The benefit to the student *

The student will be given an opportunity to improve further their software development skills in C++. The project involves large scale software libraries, written by the third parties, and is done as a part of a medium sized team of academics and researchers. The student will have an opportunity to work as a part of a real life software engineering development team.

The skills that the student would need to have. *

Strong programming skills in C++, good mathematical skills, experience in large software development projects (optional).

The nature of the work that the student would do *

Understanding the documentation of two open-source third-party software packages and implementing a wrapper class to merge these packages into a functional unit.

How the project would be implemented (if appropriate) *

The student will review the necessary documentation and the examples of the inclusion of other public software libraries into the finite element library used for the implementation of the MTA, followed by the implementation of the wrapper class for the mesh generator.

Infrastructure requirements and any required staff support other than the project supervisor *

Standard Linux-based PC

Supervision arrangements throughout the duration of the project (named staff and dates covering the entire duration) *

Vasilis Pavlidis (for the first six weeks), Dr Yi-Chung Chen (for the other 4 weeks)

Location of the project work (office and building) *

IT302

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