

Fully Funded EPSRC PhD Case studentship.

Project Title: Sparse data structure for computed tomography measurements Aerospace

The importance of computed tomography (CT) measurements is increasing in the fields of dimensional and surface metrology. The typical workflow of a CT measurement, after the volume reconstruction, consists in applying an edge enhancing filter to remove the noise and performing the segmentation in order to find the object of interest. Modern CT devices may produce volumetric dataset of 2000 x 2000 x 2000 voxels, the size of the dataset is approximately 30 GiB. Though the data size is high, only a small portion of the volume is needed: the voxels around the surfaces of the objects. The total number of the voxels around the surface that has to be exacted is usually less than one tenth of the total number of voxels of the volume. The aim of the project is to use sparse volume data structure to convert a dense volume into a lighter representation. Using a sparse data structure allows faster filtering and segmentation processes. Mathematical models able to perform the segmentation of object with the accuracy required in the metrology will be designed. The candidate should design algorithms that work both multithreading CPU and GPU to use the advantages of modern graphical cards.

Eligibility: The student must have a high-grade qualification, at least the equivalent of a UK 1st or 2:1 class degree or MSc with distinction in Physics, Engineering or related disciplines. The student must be proficient in both written and spoken English, and possess excellent presentation and communication skills.

Salary: £15,285 (2020/21 EPSRC Standard)

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