High Performance Computing for Medical Interventional Planning Applications

Monday, 2 December 2019 11:00 (20 minutes)

Personalised solutions for healthcare are increasingly recognised as an important approach for treating a variety of conditions that have different outcomes, based on the patient. In the field of computational mechanics, different virtual pipelines have been developed in an effort to improve interventional planning and long-term patient outcomes. One of the major challenges to realising patient-specific treatment tailoring is a mismatch of timeframes. Clinical diagnoses and treatments need to be carried out in as short a timeframe as possible, while traditional CFD codes tend to run over longer time periods.

The use of high performance computing platforms has been beneficial in the development of interventional planning pipelines for cerebral aneurysm thrombosis and congenital heart disease. For aneurysms, it is important to determine what type of clot will form in the aneurysm sac, based on the treatment modality selected. In the case of congenital heart disease, treatments which are selected need to be optimised to ensure that solutions will remain suitable as the child grows to adulthood. This talk will explore the challenges encountered in developing these two pipelines for clinical use.

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