



Título: An a priori good quality domain decomposition technique for automatic parallel generation of tetrahedral mesh

Data: 18/02/2019 Horário: 16:00h Local: Sala Seminários – Bloco 952

Resumo:

This work describes a technique for domain decomposition to generate meshes using parallel computers with distributed memory. This technique relies on a partitioning structure that uses axis-aligned planes to decompose the domain. These decomposing planes are determined by a binary partitioning structure based on a refined quadtree (in two-dimensional case) or octree (in three-dimensional case) that is built to estimate the amount of work necessary to generate the whole mesh. Thus, the amount of work in each subdomain is approximately the same. The level of refinement of the quadtree or octree is used to guide the creation of each subdomain's interface, defined by its inter-cell discretization. The interface mesh generation is performed a priori, i.e., every subdomain has its interface mesh fully created and improved before the internal mesh generation phase. This technique generates new domains completely independent from one another and allows to abstract the mesh generation technique applied to the subdomains, which can combine, for example, Delaunay and Advancing Front Techniques, among others. Also, our load estimation technique produces results that accurately represent the number of elements to be generated in each subdomain, leading to an adequate prediction of execution time and a well-balanced algorithm, a desirable feature in parallel processing that is usually difficult to achieve. The meshes generated with the parallel technique have the same quality as those generated serially, within acceptable limits, which is what is expected from parallel approaches.

Defesa de Proposta de Tese: Daniel Nascimento Teixeira

Escrito por Secretaria MDCC

Sex, 15 de Fevereiro de 2019 00:00

Banca:

- Prof. Dr. Joaquim Bento Cavalcante Neto (MDCC/ UFC) - Orientador
- Prof. Dr. Creto Augusto Vidal (MDCC/UFC) - Coorientador
- Prof.^a Dr.^a Emanuele Marques dos Santos - (MDCC/ UFC)
- Prof. Dr. Markos Oliveira Freitas (UFC)