

SOME RECENT DEVELOPMENTS IN PARALLEL MESH GENERATION

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Abstract. A scalable, parallel advancing grid generation technique has been developed for complex geometries and meshes with large size variations. The key innovation compared to previous techniques is the use of a domain-defining grid that has the same fine surface triangulation as the final mesh desired, but a much coarser interior mesh. In this way, the domain to be gridded is uniquely defined, overcoming a shortcoming of previous approaches.

This domain-defining grid is then partitioned according to the estimated number of elements to be generated, allowing for a balanced distribution of work among the processors. As a side benefit, the domain defining grid can be used to mesh with very high efficiency the inter-domain regions, another shortcoming of previous techniques.

The domain defining grid is also used to redistribute the elements and points after grid generation, and during the subsequent mesh improvement.

Timings show that the approach is scalable and able to produce large grids of high quality in a modest amount of clocktime.