Mesh generation and adaptivity
Mesh generation methods are used in a daily basis by computational engineers and scientists to obtain numerical predictions on discrete approximations of complex geometrical configurations.

Summary

Meshes are a key ingredient to perform computer simulations with unstructured methods such as the finite element method. The mesh is a potentially large and complex object that discretizes the model domain into small elements or subdomains, which are the basic objects on which the analysis is performed. The size of the mesh elements can be locally adapted to obtain more accurate approximations to the PDE solution.

Objectives

Our current research in meshing deals with:

- Curved mesh generation for unstructured high-order methods
- Quality based framework for mesh validation and optimization
- Automatic mesh generation for wind farm simulation
- Mesh based representation of urban areas for forecast simulation
- Reduction and measurement of the geometrical error

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Source URL (retrieved on 10 May 2020 - 05:42):

https://www.bsc.es/research-development/research-areas/engineering-simulations/mesh-generation-and-adaptivity