

A New Dualised Mesh Generator Including Mesh Optimisation

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The importance of generating high quality meshes for running CFD simulations has motivated the current work on developing a new mesh generator within the OpenFOAM framework. In the new meshing approach, a starting base mesh is generated with the desired refinement levels using existing feature, surface and volumetric refinement methods. The base castellated mesh then has a single mesh layer added at all refinement interfaces together with the splitting of all boundary connected cells. An example of the resulting mesh converted into its dual form can be seen in Figure 1

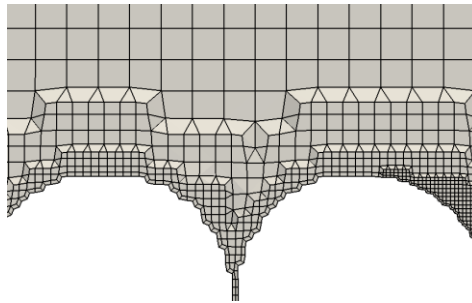


Figure 1 Dual Mesh

The dual mesh contains a single layer of cells at all boundary patches. The mesh is then snapped to the surface and additional surface layers can be added by splitting the first layer of cells. To improve final mesh quality a new mesh optimisation based on maximizing cell sphericity is used. An example of the meshes generated on the DrivAer geometry (produced by Technische Universitat Munchen) are shown in Figure 2

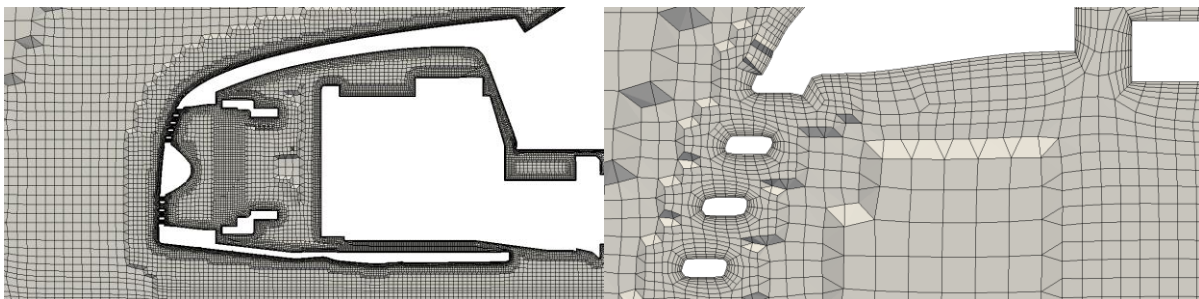


Figure 2 Mesh generated with 6 Surface Layers on DrivAer Case