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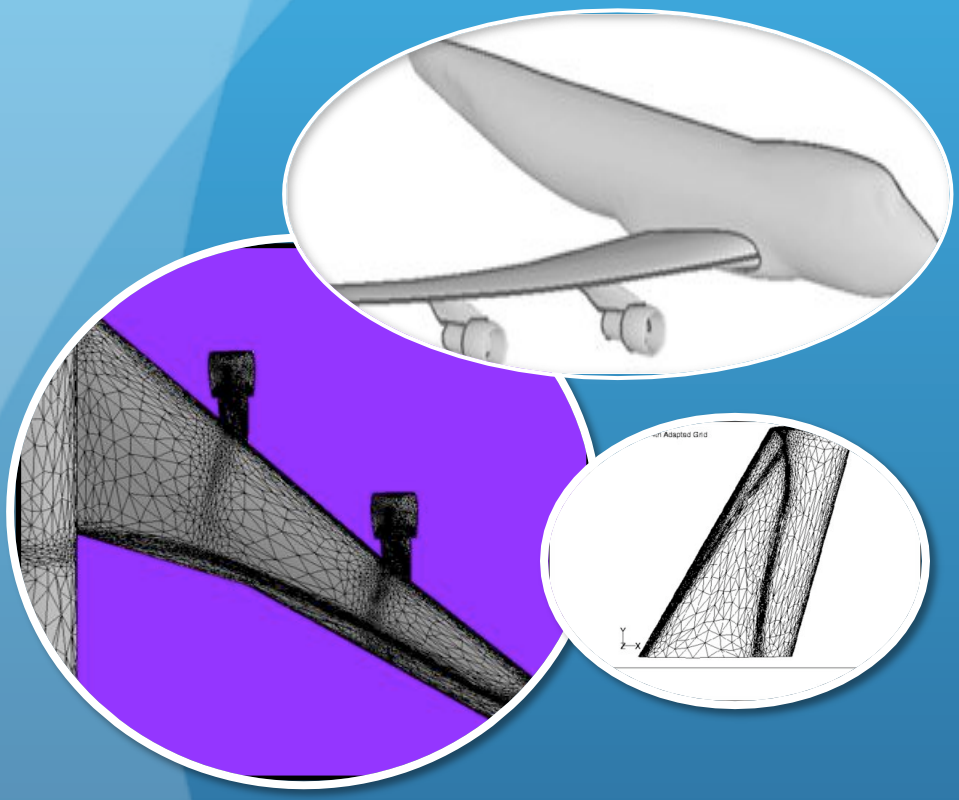


OptiGrid

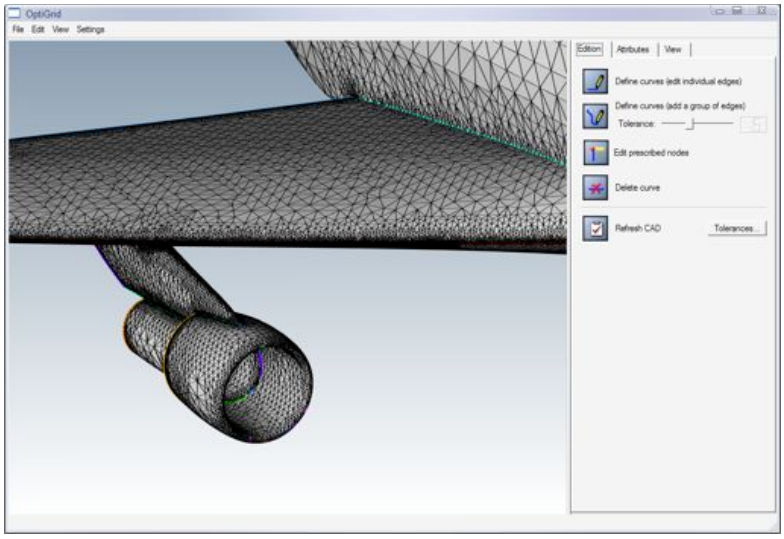
A Revolutionary 3-D Generic Automatic Mesh Adaptation Module for *any* CFD solver Using *any* Mesh Generator

OptiGrid is a comprehensive, automatic mesh adaptation and CAD reconstruction software which helps achieve high-precision CFD simulations, at the lowest computational cost. OptiGrid can be linked to *any* commercial or proprietary flow solver through the CGNS format or using its generic file format.

OptiGrid starts by automatic CAD reconstruction from grids generated by *any* mesh generator. A simple graphical interface allows users to define the boundary conditions before mesh adaptation.

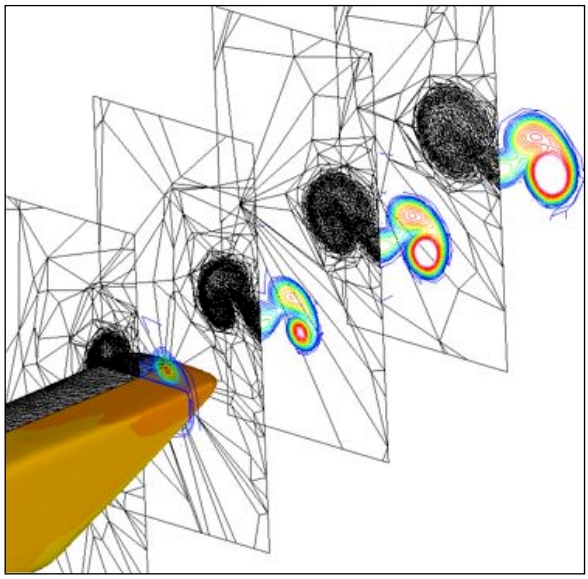
Then OptiGrid performs mesh smoothing even before starting CFD calculation, to set the number of grid points, to improve surface definition, and to concentrate cells in directions provided by the user.

As soon as an initial CFD solution is obtained, OptiGrid assesses its quality, edge by edge, via an a posteriori error estimator based on minimizing the solution truncation error. OptiGrid then systematically modifies the mesh to reduce and equalize the error in the domain. The grid is automatically adapted by moving nodes, and refining / coarsening / swapping edges. All operations being edge-based, OptiGrid can be coupled to any finite volume or finite element flow code that uses unstructured meshes composed of any one-type or hybrids of hexahedral, tetrahedral, prismatic and pyramidal elements. All surface mesh adaptation operations performed by OptiGrid respect the reconstructed CAD.

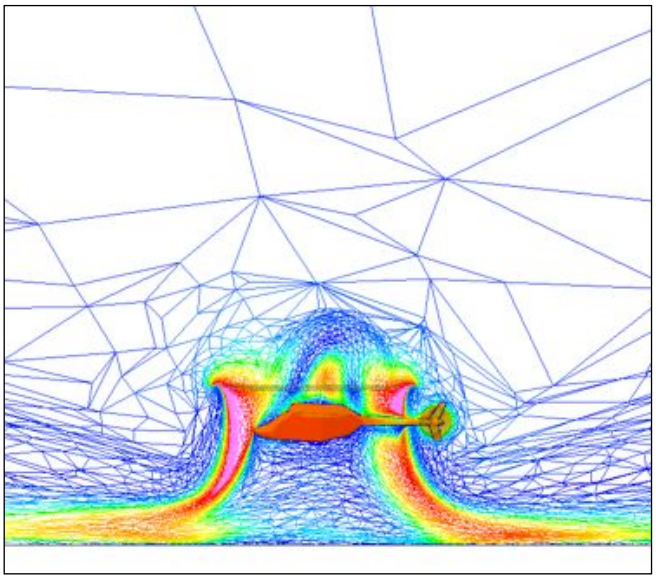


Automatic CAD reconstruction of an aircraft, based on an initial grid

OptiGrid does not refine blindly in all three directions, but yields anisotropic meshes (stretched in one direction), significantly reducing the number of grid points, and capturing with high resolution uni-directional CFD features such as shocks, boundary layers, wakes, vortices and slip lines.



Adapted mesh in fuselage wake



Adapted mesh for helicopter hovering in ground effect

All CFD images produced by FieldView

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Newmerical Technologies International (NTI) develops and markets advanced CFD software and offers flow simulation services in the aerospace, architectural, automotive and marine markets. NTI is an acknowledged leader in mesh optimization methods for “reliable” CFD.

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