

CFD Meshing by Automatic Partitioning with the 3D Medial Object

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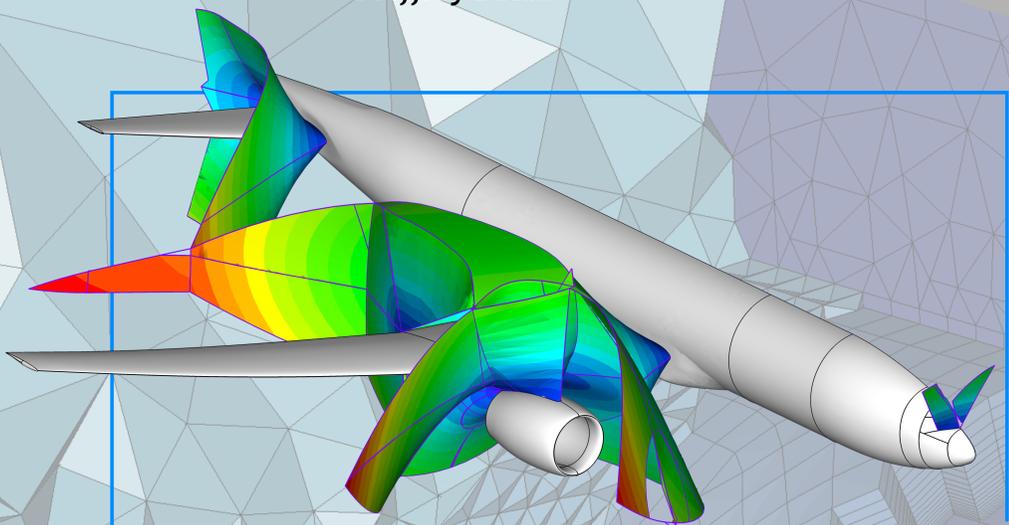
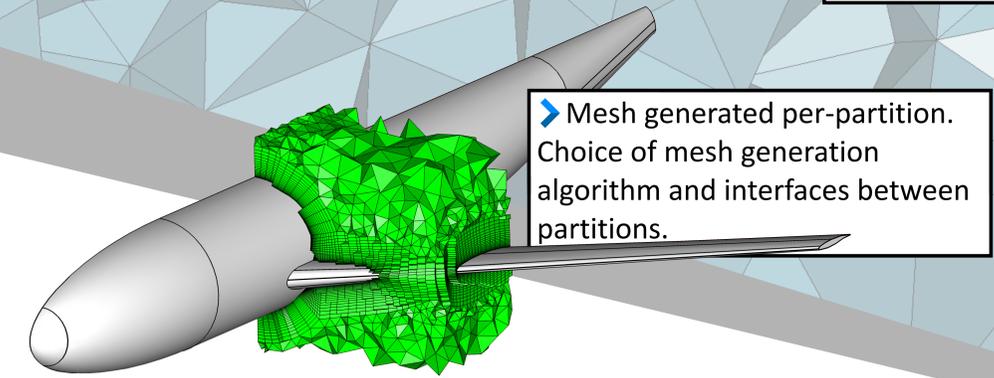
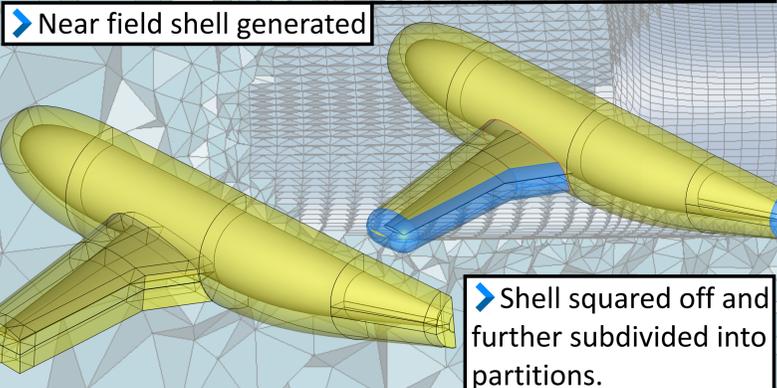
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Automates the creation of aerodynamic meshes containing a combination of structured and unstructured styles, gathering significant benefits from both.

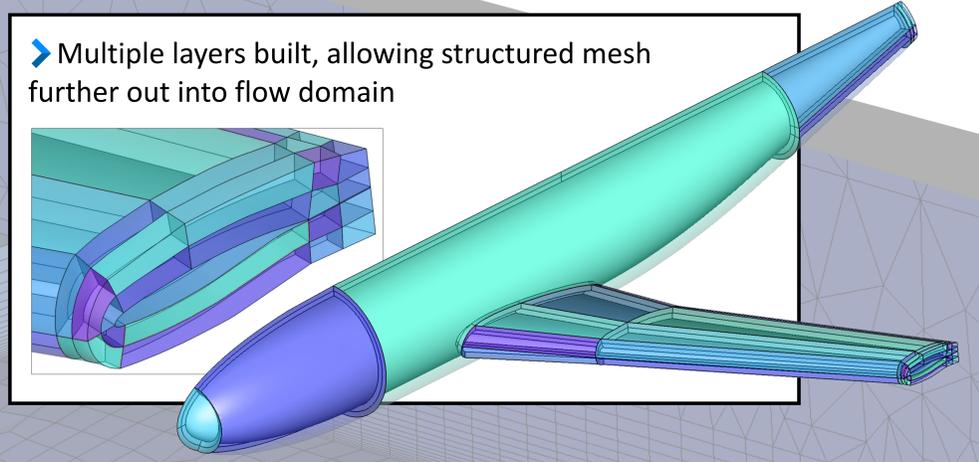
The 3D medial object (medial axis transform held as non-manifold B-rep geometry) is used to generate an offset surface, which is then modified to build predominantly hexahedral and prismatic partitions.

- Nearfield automatically partitioned.
 - Partitions can contain
 - Structured (Hexahedral, TFI, Cartesian)
 - Swept (Hex from quad paving, Wedge from triangles)
 - Unstructured (Hex, Tet, etc.)
 - Hybrid (Layer growth within partition)
- Arbitrary block shapes permitted to ease automation.
- Squaring off converts O into C or H topology.

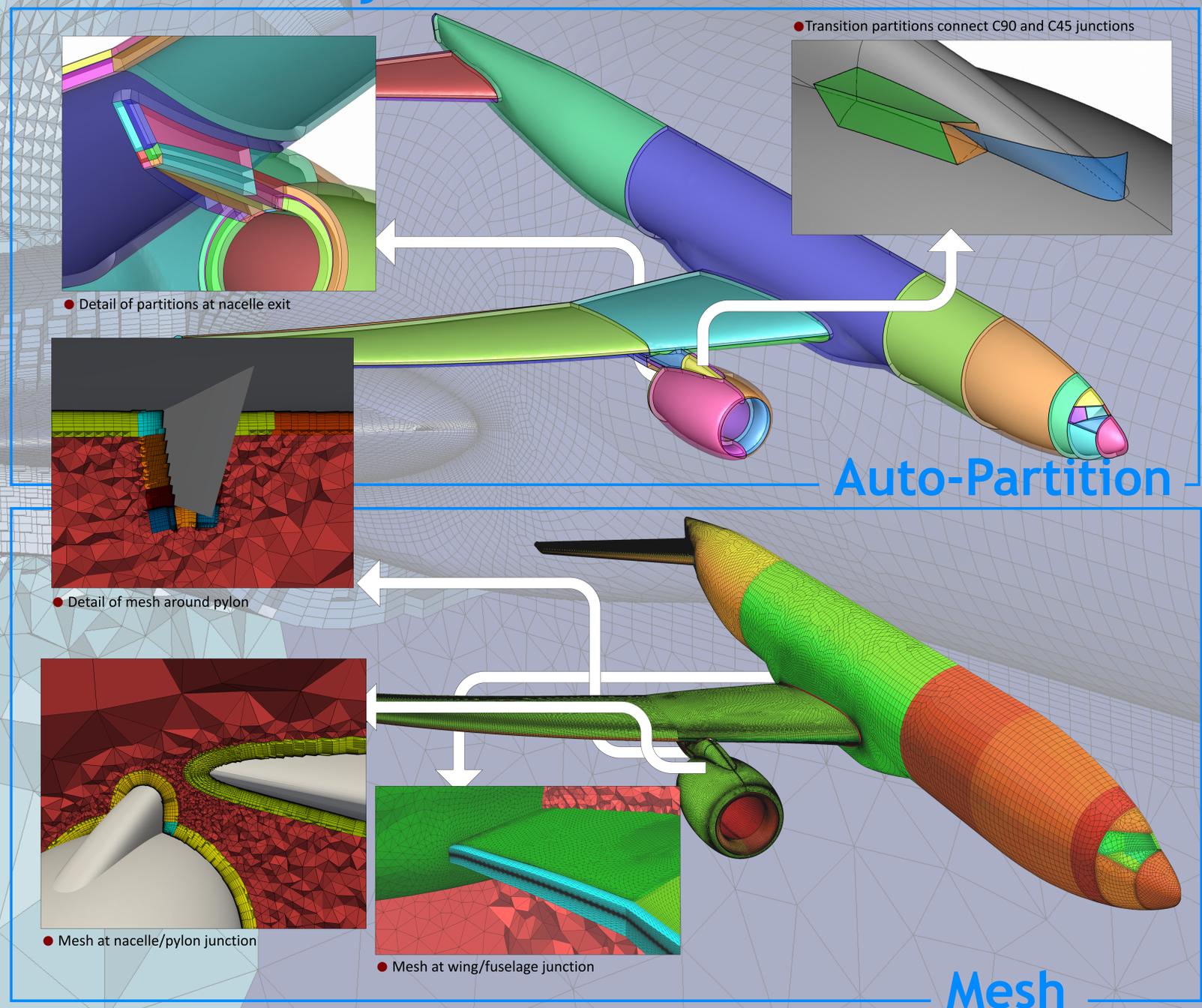
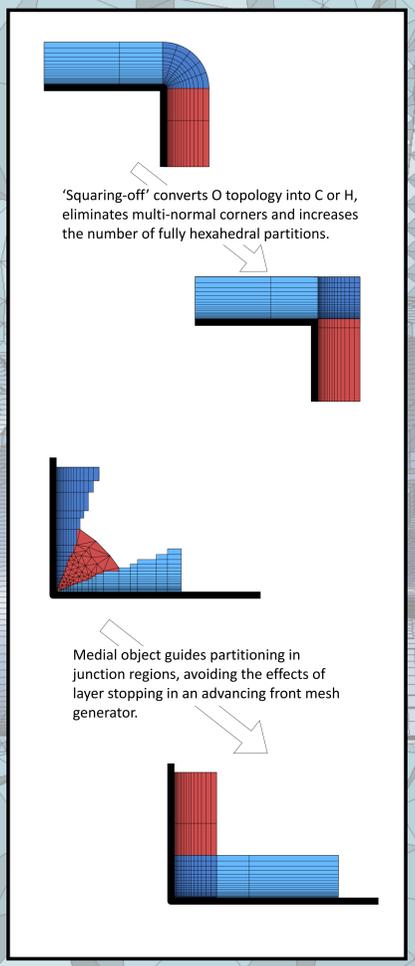
- 3D Medial Object identifies junctions and air gaps.
- Halos (contours of fixed radius) traced to support shelling operation
- Near field shell generated
- Shell squared off and further subdivided into partitions.



3D Medial Object



➤ Multiple layers built, allowing structured mesh further out into flow domain



Auto-Partition

Mesh