Surface Mesh Generator

Motivation: A proper preprocessing tool is required for our computational platform (TAMS-Aero) to meet the projects demand in the Turkish Aerospace.

Objectives:

* To develop surface mesh generator within the agreed time schedule (for TAMS-Mesh) – End of 2026
* The subject tool shall be able to generate valid high-quality surface meshes for complex geometries from the aerospace industry in acceptable time frame (using parallelization)

Scope:

* Input: Watertight CAD geometry (STEP/IGES format)
* Output: High quality triangulated surface mesh
* The surface mesh generator plan composes of 4 steps:
  1. CAD functionalities (Import/Export – Closed Checking – Geometrical Queries)
  2. Surface Meshing Algorithms Implementation
  3. Optimization / Post-processing
  4. Export STL
* Open-source surface meshing pitfalls:
  1. Sumo: As far as we know, it works only with parametric shapes. It is difficult to compile.
  2. Gmsh (Mesh adapt)
  3. Netgen