Simulation of the Drag Coefficient of a Monkey Head with OpenFOAM®

Community Christmas Competition proposed by József Nagy

flOTH CFD Team

Ostbayerische Technische Hochschule (OTH) Amberg-Weiden
Department of Mechanical and Environmental Engineering

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Geometry Preparation

- Removal of intersecting faces in Blender™

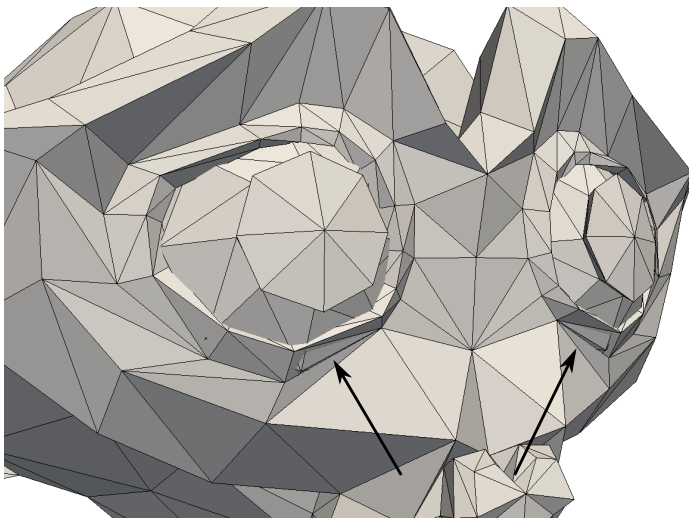

Figure: Face Intersections

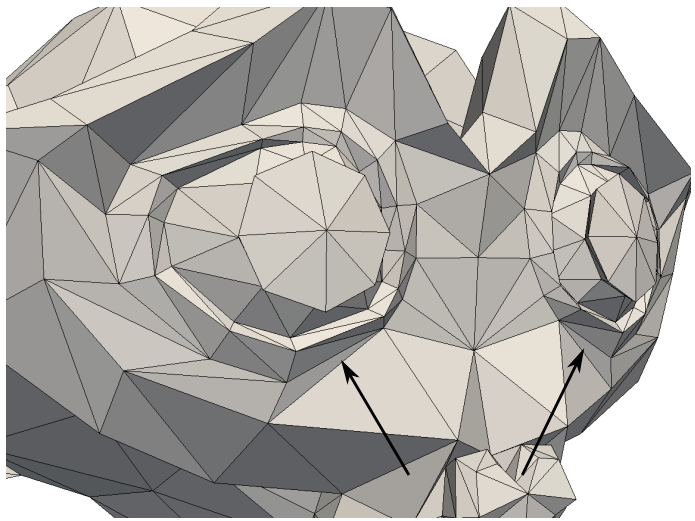

Figure: Enhanced Surface Triangulation

Calculation Setup

Table: Solution Setup

Parameter	Setting
Software	OpenFOAM 4.1
Solver	simpleFoam
Turbulence model	k-ω-SST
Convective term discretization	linear upwind

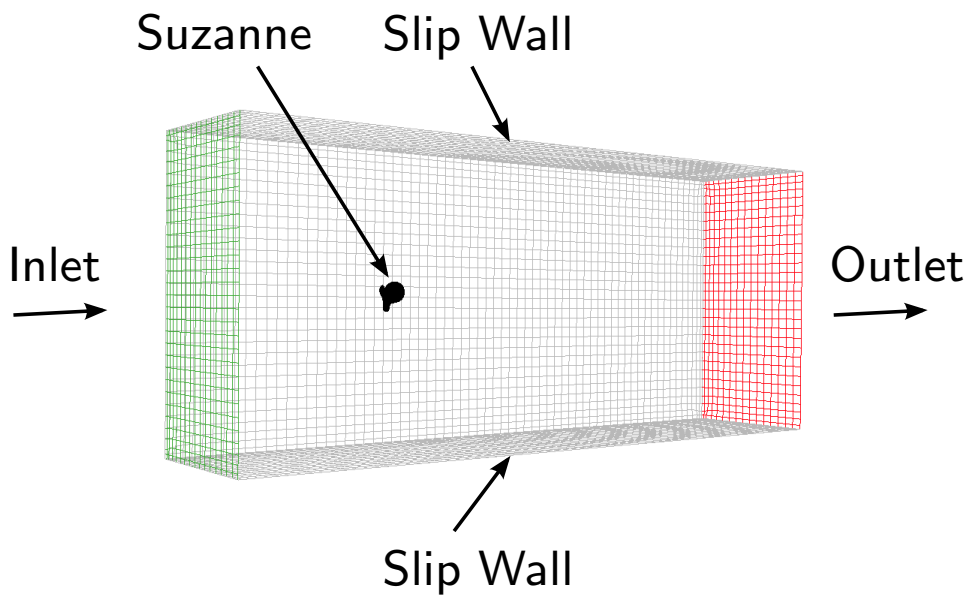

Figure: Boundary Definitions

Meshing - cfMesh

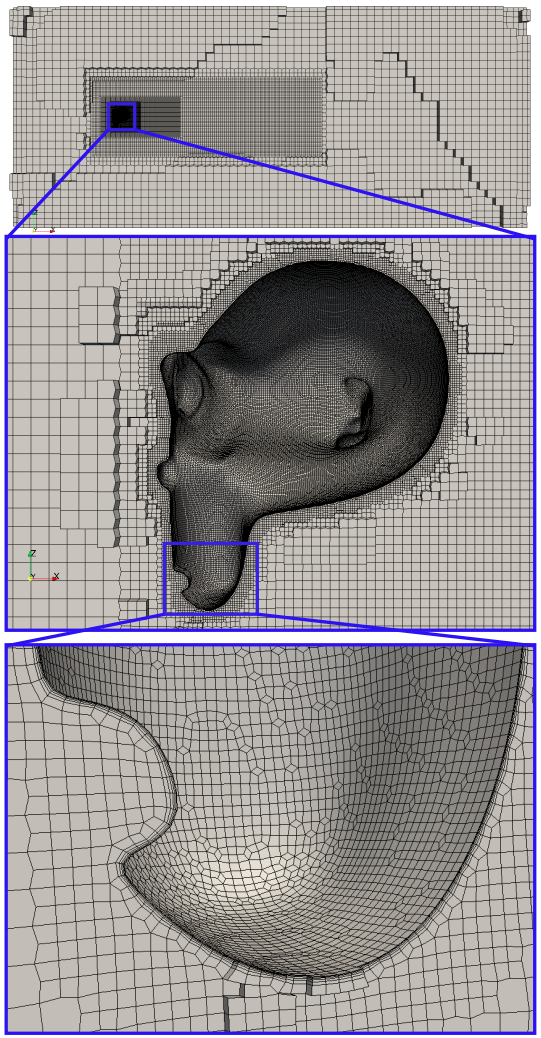

Figure: Mesh Topology

Table: Mesh Metrics

Parameter	Value
Number of cells	1,555,784
Cell size min.	2 mm
Non-orthogonality max.	49.2
Skewness max.	1.5

Figure: y+ Values for $Re = 10^5$

Drag Coefficient vs. Reynolds Number

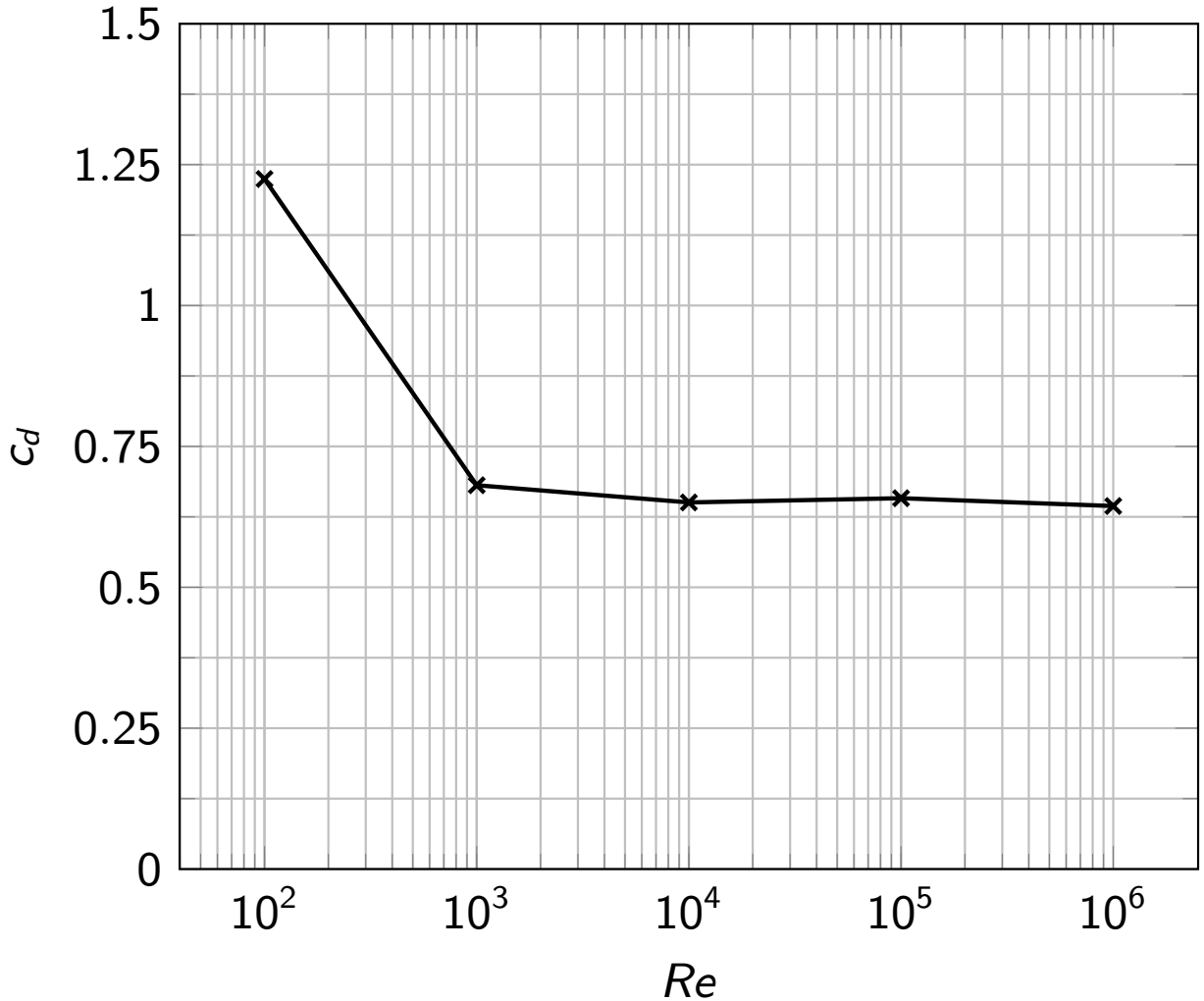

Figure: Drag Coefficient c_d vs. Reynolds Number Re

Transient Solution

- Watch our transient special on YouTube!

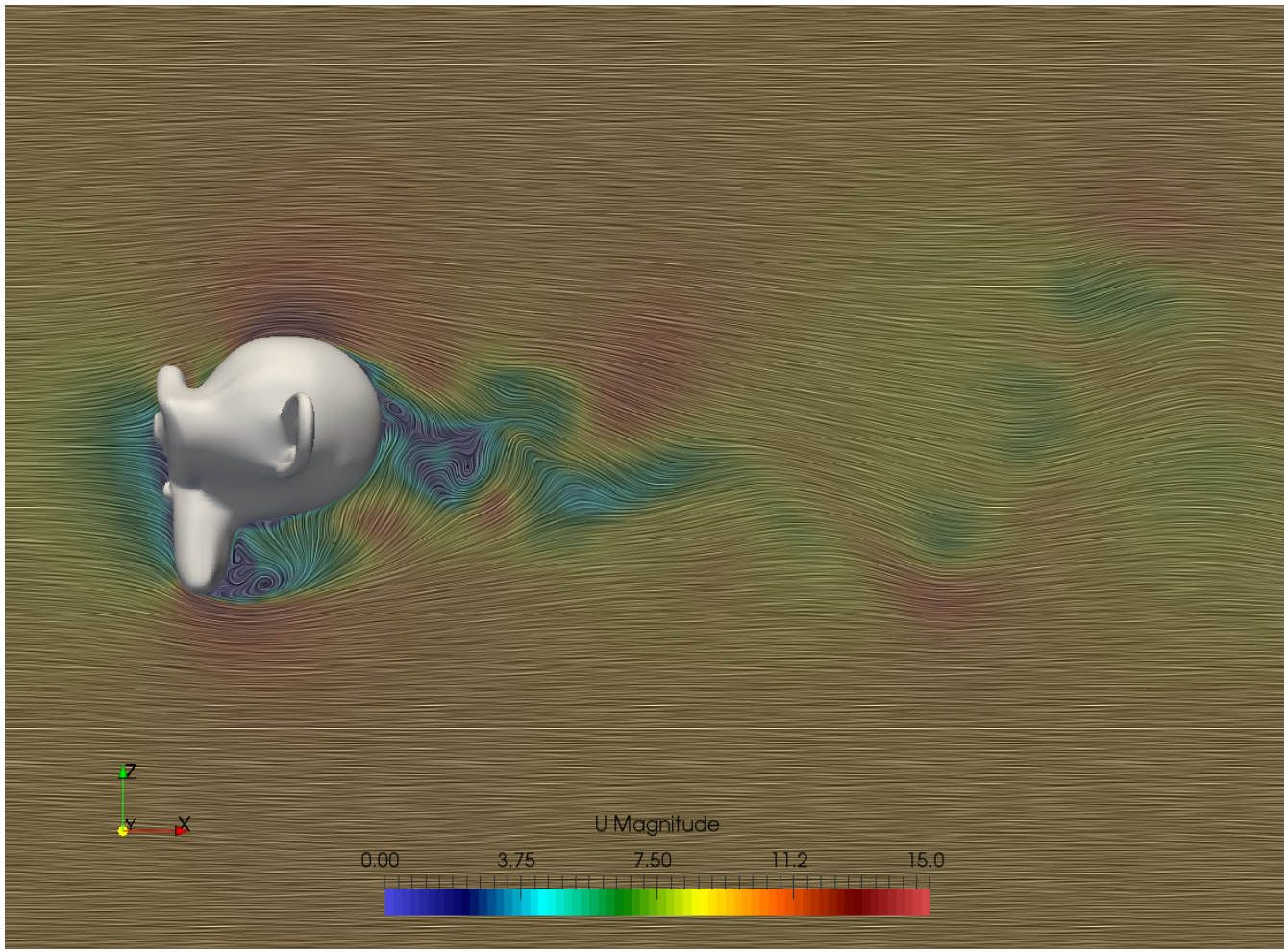

Figure: `https://youtu.be/HLlhMiA897w`