



Georgian Technical University



Geometry Development for the Visualization Applications

ATLAS-GTU TAI Agreement Workshop

Besik Kekelia

29 November, 2022



Contents

01

Our Goal

Geometry Development for the Visualization Applications, which runs on the web browser

03

Applications

Using 3D Geometries in Various Web Applications

02

Life Cycle

The Life Cycle of Development of Geometries




04

Summary

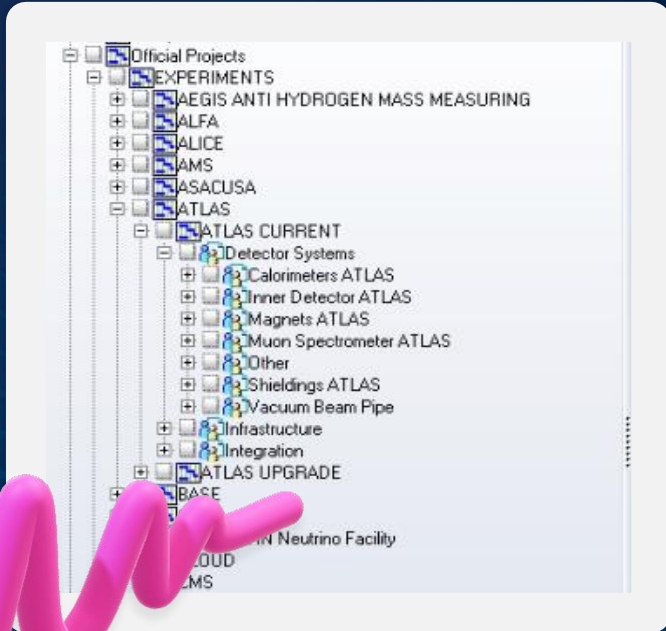


01 Our Goal

Geometry Development for the Visualization
Applications, which runs on the web browser

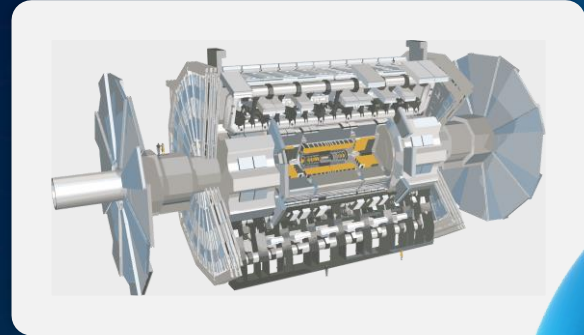


SmarTeam

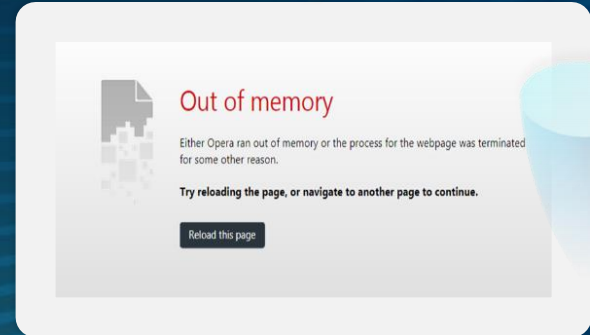


There is a 3D model of the Atlas detector on SmarTeam, but cannot be used directly for visualization applications

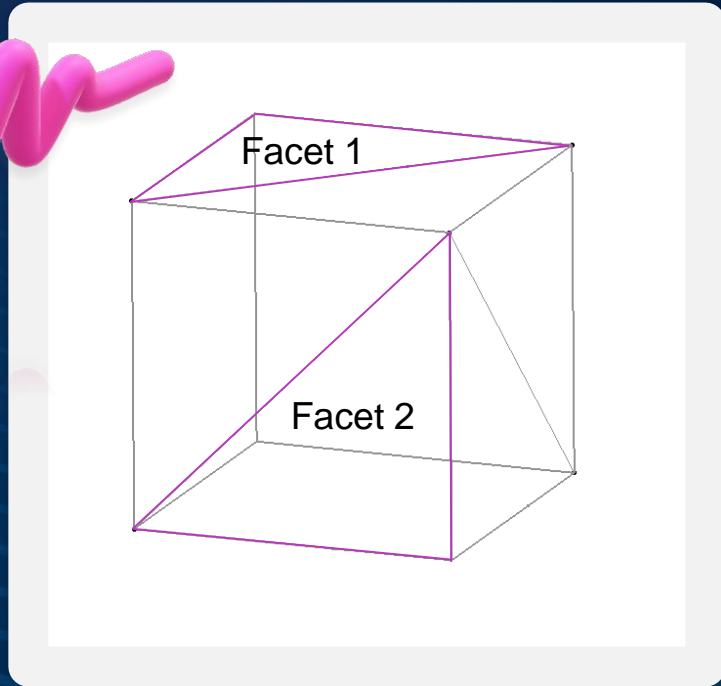
Geometrical Model of the ATLAS Detector



Internet Browser

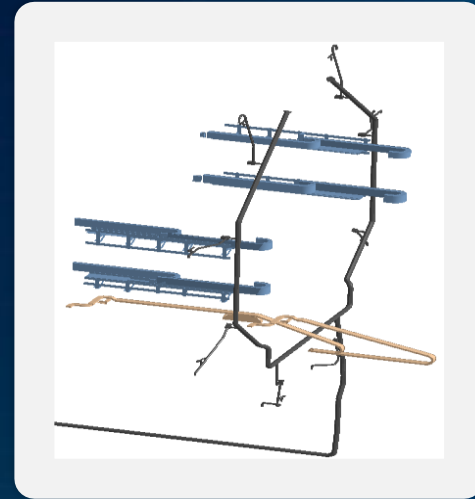


Example of facets



There are a total of 12 facets in a cube

Services of New Small Wheel



Total facets of Detailed model: 965184
Total facets of Simplified model: 25100

The facet limit for internet browsers is 1`500`000



02 Life Cycle

The Life Cycle of Development of Geometries



The Life Cycle of Development of Geometries

Step 1

Finding a 3D model



Step 2

Simplifying a detail 3D model



Step 4

Coloring 3d models

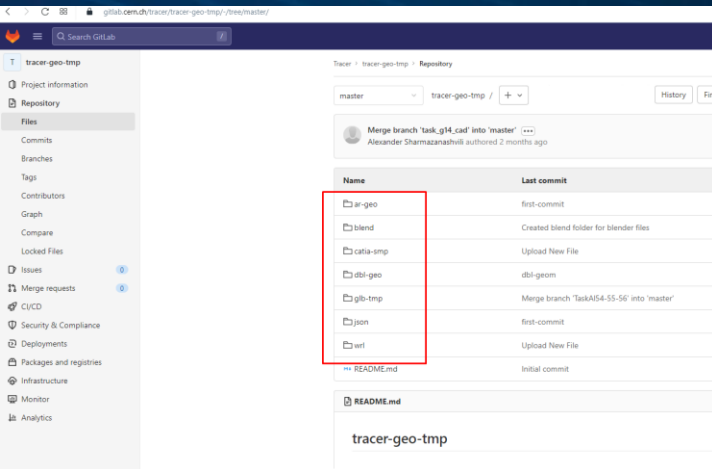


Step 3

Cut the of the 3D model



Repository of Geometry on GitLab





03 Applications

Using 3D Geometries in Various
Visualization Web Applications

Several applications are developed in our center. You can see them at this link

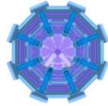
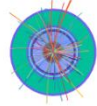
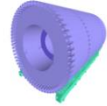



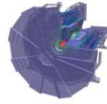

<https://tracer.web.cern.ch/tracer/>




ATLAS Tracer

3-Dimensional Framework for the Visualization of the ATLAS Detector

[GitLab](#)

 <p>TracerCORE Core module of the 3-Dimensional Visualization of the ATLAS detector</p> <p>Go to Application</p>	 <p>TracerEVD 3-Dimensional Event Display Application</p> <p>Go to Application</p>	 <p>TracerTCAL 3-Dimensional Interactive Display of the Tile Calorimeter</p> <p>Go to Application</p>	 <p>TracerART Augmented Reality Table enables to put detector on the discussion table</p> <p>Go to Application</p>
 <p>TracerAR-BOOK Augmented Reality Book is the 3D-extension of the paper printed documents</p> <p>Go to Application</p>	 <p>TracerVR Virtual Reality application for the realistic representation of the digital content of Detector in the 3D</p> <p>Go to Application</p>	 <p>TracerQuickATLAS Quick Visualization of the ATLAS detector</p> <p>Go to Application</p>	 <p>TracerARD Augmented Reality Door for the navigation inside of the ATLAS detector</p> <p>Go to Application</p>

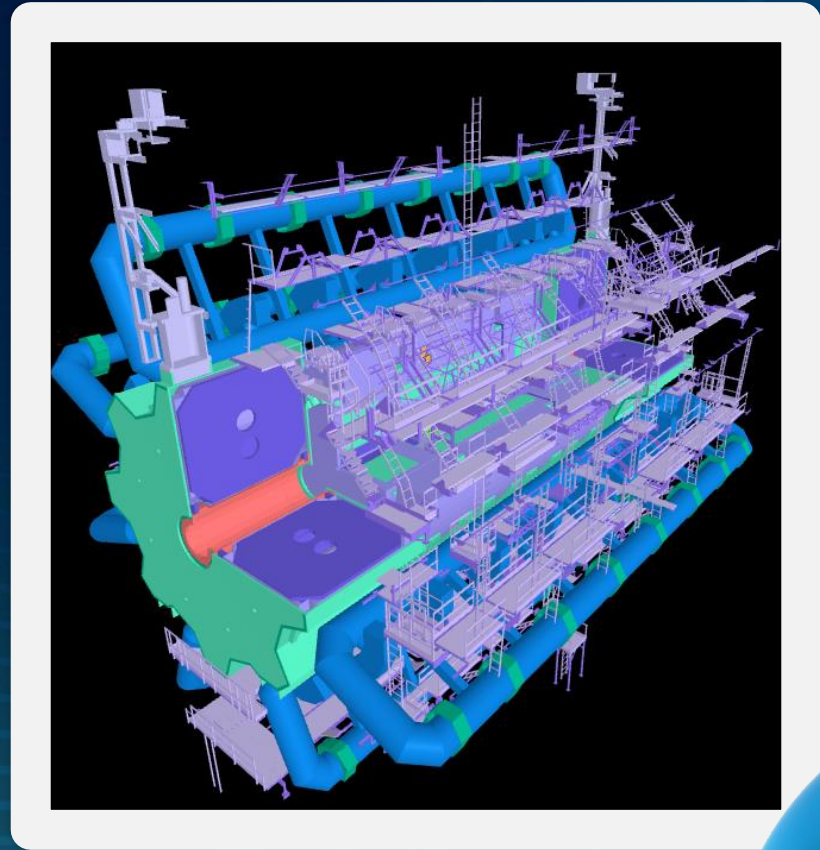


04 Summary

At this stage, 27 structures of the Atlas detector have been processed

Main structures:

- ⊖ ATLAS DETECTOR
 - ⊖ MAIN COMPONENTS
 - ⊕ MAGNET SYSTEMS
 - ⊕ INNER DETECTOR
 - ⊕ CALORIMETRY
 - ⊕ MUON SPECTROMETER
 - ⊕ FORWARD SHIELDING
 - ⊕ SERVICES
 - ⊕ PLATFORMS
 - BEAM PIPE
 - ⊖ SUPPORT STRUCTURE
 - ⊕ MECHANICAL STRUCTURE
 - ⊕ CAVERN





Thanks!

bkekelia@cern.ch

Georgian Technical University

www.gtu.ge

www.cadcam.ge

