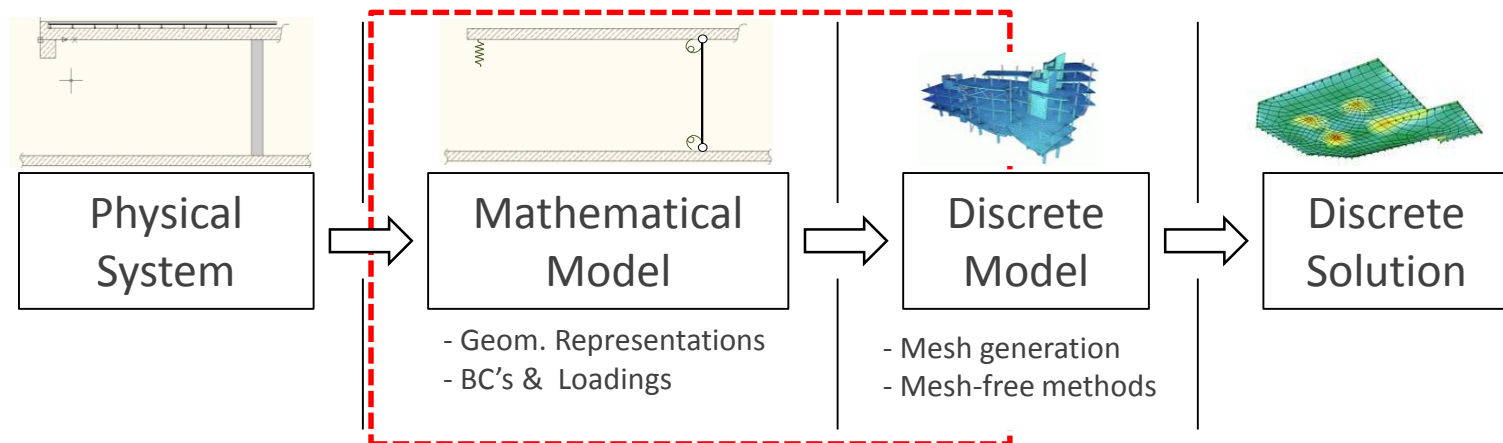


# Implementation of geometric modeling tools based on QT and OpenCASCADE

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Implementation of modeling features in an existing pre-processing framework

- *Geometric modeling*
- *Pre-processing (mesh generation) for numerical simulations*
- *Object-oriented programming*



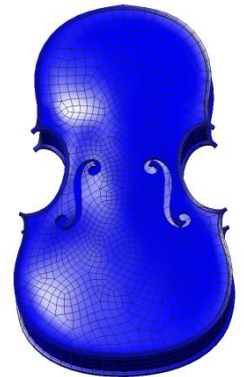
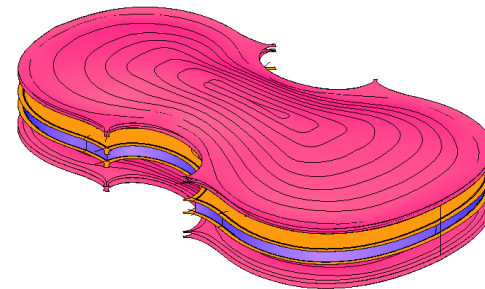
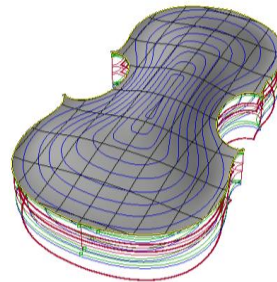
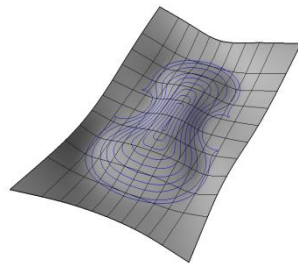
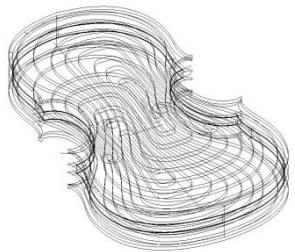
## Geometric modeling for numerical simulations:

- Geometric model is the starting point for all numerical simulations
- Geometric model has to be adjusted to pre-processing and processing algorithms
- Powerful modeling tools are needed to realize complex shapes and models

Pre-Processing framework

Geometric modeling

Mesh-generation



a) **Wireframe model:**  
Splines, NURBS..

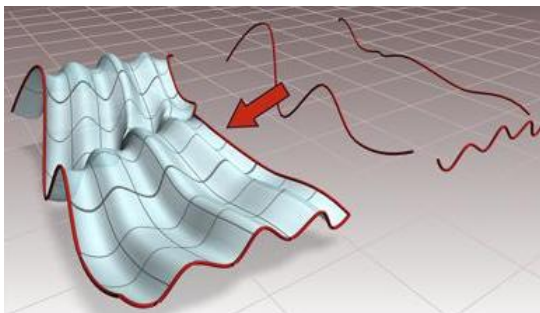
b) **Surface model:**  
Free-form surface modeling (NURBS..)

c) **BREP Model:**  
Adjusted to meshing algorithm

d) **FE Mesh:**  
e.g. hex mesh

## Your tasks in this project:

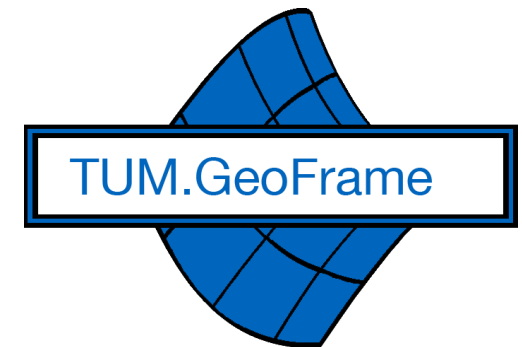
- Implementation of geometric modeling features using the object-oriented libs of **OpenCASCADE** (C++)
- Realizing graphical user interface using the object-oriented libs of **QT** (C++)
- Integration of code in the **TUM.GeoFrame** framework (Chair CiE, C++)



a) Modeling with OpenCASCADE



b) GUI programming with Qt



c) TUM.GeoFrame pre-processor



## Supervision:

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