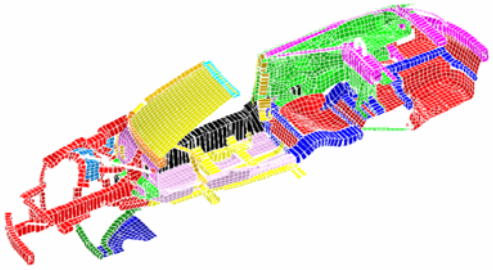
Topic 5 :
Roll-over loadcases for early design optimization in automotive development

The **iabg** with its headquarters in Ottobrunn (Munich) is an European technology and science service provider. They are also supporting BMW in the early states of automotive design.
In this joint project of **Lehrstuhl für Bauinformatik** and **iabg** a java graphical user interface for the creation of roll-over loadcases in Nastran will be developed.

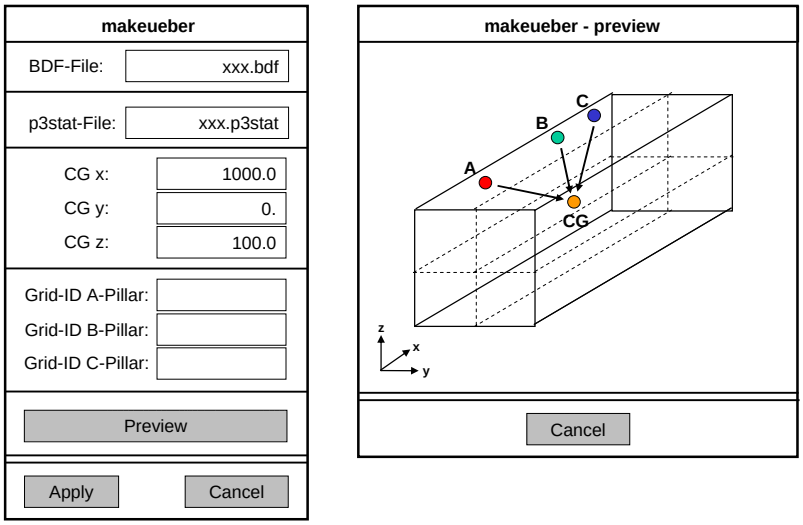


Beam-shell model of a car

A simplified beam-shell model of the car is subjected to a number of standard tests. Among others the roll-over loadcase is investigated. There exists a mastersthesis that provided a framework in Java. This software-lab will expand this framework for the roll-over loadcase.

Tasks:

- Getting familiar with Java programming and existing code
- Parsing a Nastran file and identifying the roll-over points A,B,C
- Calculate the vector from the roll-over point to the center of gravity CG.
- Write a Nastran control file



Possible user-interface fort he roll-over loadcase definition

Possible add-ons

- Schematic representation of the car displaying the relevant points and vectors.
- More detailed representation of the car
- User interaction (turning, picking)

Benefits

- Gain experience with a platform-independent object-oriented programming language (Java)
- Getting to know “real industry” tasks.
- Contact to an possibly interesting employer.

References

[1] http://www.iabg.de/automotive/
[2] Engin Mendi **Development of a Graphical Java-ToolBox for Creating Design Models for Optimization with Nastran.**
http://www.inf.bauwesen.tu-muenchen.de/lehre/diplomarbeiten/frame.php?main=mendi