BETA
SIMULATION SOLUTIONS

LCFC 联宝科技

LCFC (Hefei) Electronics Technology

The Laptop-Modeling automation tool

A tool for a complete automated process for laptop modeling that involves: CAD data import, meshing, assembly, solver-deck setup, deck mapping, solving, and report generation.

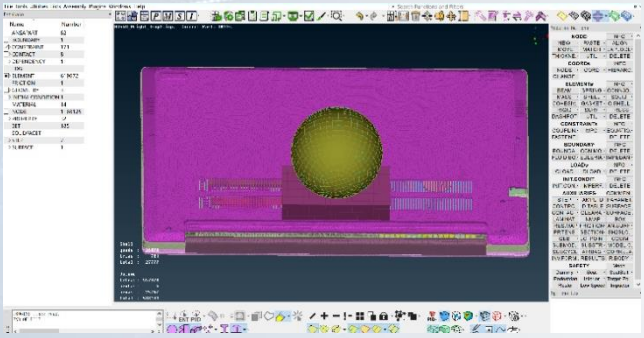
Laptop modeling involves several tedious manual tasks such as geometry cleanup, shell meshing, volume meshing, connections definition, and many more.

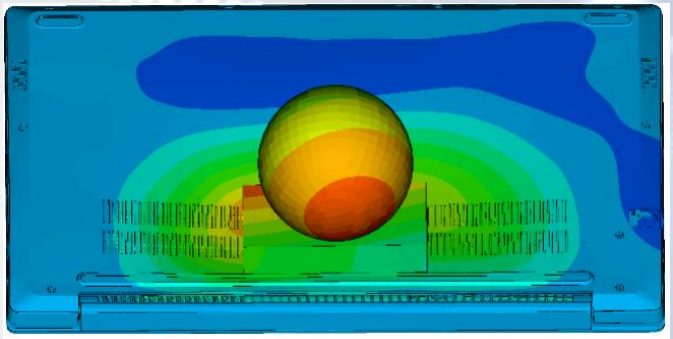
However, building the connectors can be proved to be a complex process, involving different locations on different parts, or different numbers of connected couplings and materials.

Such issues, faced in daily engineering practices, are successfully addressed, and handled by a special script developed by BETA CAE Systems China in close cooperation with LCFC.

"This process automation involves preparing FE models with complex connectors. BETA offered a robust, highly flexible automation tool and backs it up with an outstanding support team. This way, LCFC achieved a 200% efficiency increase for this process."

Jiabin Bi
Senior Engineer
LCFC (Hefei) Electronics Technology





Challenge

The aim of this effort was to achieve automation, to the greatest possible extent, to minimize modeling and deck setup time.

The most notable challenges were:

- The geometric cleanup of hot-melt columns.
- The need to assign of different meshing patterns and element types to different parts.
- The creation of couplings and connectors.
- The materials assignment according to different screw types at different locations.
- The entities' one-to-one mapping from ABAQUS to LSDYNA.
- The reports generation according to different loadcase templates.

Approach

A customized GUI was developed, specifically tailored on the customers' requirements, grouping all the required functionality for the process.

For the post-processing, a user toolbar was provided for the generation of reports, according to different loadcase templates.

With the help of the available API, different meshing algorithms were assigned to different buttons, for the realization of various meshing requirements. Manual controls were also incorporated in this GUI, to extend its capabilities.

Innovative geometric cleaning for hot-melt columns paves the way for the creation of the subsequent connections.

Screws are identified and stored in a separate database. With reference to this database, the locations, materials, and types of screws can be detected, and according to the areas of the screws, relevant couplings involved in one connector can be identified.

Moreover, the tool provides functions for the one-to-one mapping between the different Abaqus and LS-DYNA entity types.

Last, the META session recording functionality, combined with BETA's Python API, produces a unique toolbar for reports generation.

Results

Modelling is now performed automatically for all valid inputs (uniformed parts names, meshing scenario, screw library, etc.)

Reports can be generated automatically for various types of loadcase conditions.

Manual control of the meshing tasks is also possible, which makes the scope of application and operation of the tool more flexible.

LCFC, by deploying this automation tool, achieved a 67% time reduction for this process, an overall efficiency increase of 200%.

For more about BETA CAE Systems, visit: www.beta-cae.com