DEP MeshWorks

Developing a hexahedral mesh of the human leg

About the Client

The client is a global manufacturer of motor vehicle seat belts, airbags, steering wheels, interior trims and other safety restraint systems.

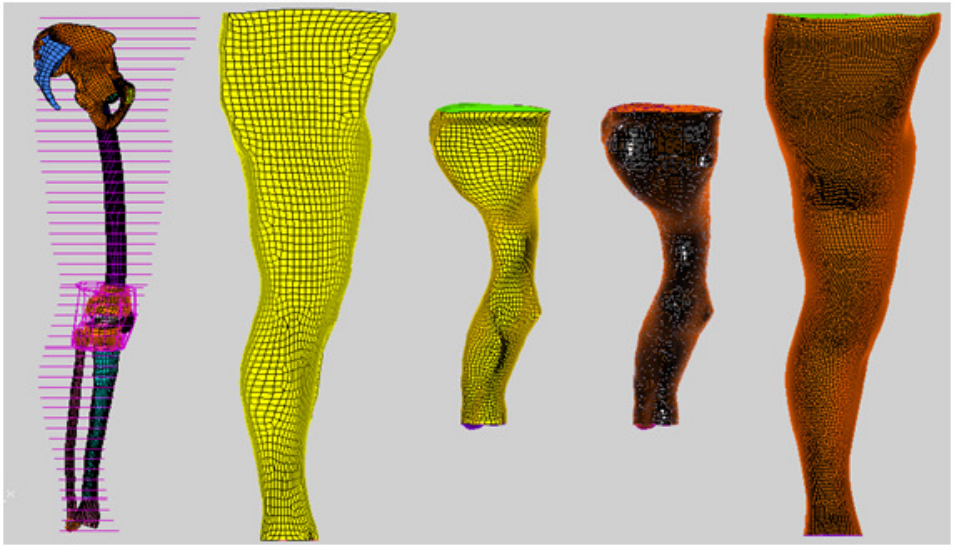
Based on DEP's experience with FEA modeling and also the in-house developed proprietary software DEP MeshWorks, the client approached DEP with project to generate a mesh with solid elements.

The Challenge

With rapid advances in safety technology in the automobile field, the goal for any OEM is for rapid design and safety evaluation of the components and reduction in market delivery time. FEA is a valuable tool to accurately analyze and predict the structural properties of any component under appropriate loading conditions. The challenge in this project was to develop an FEA mesh of human leg, for testing different safety constraints.

The Solution

Illustrated below is the hexahedral mesh generation procedure followed by DEP using the DEP MeshWorks platform. DEP was able to generate the good quality hexahedral mesh from the 2D and 1D line data in a relatively quicker time span as compared to other meshing tools.



The Result

DEP was successfully able to determine the life of the implant as per set-up. In addition to obtaining the fatigue life cycles, DEP was able to convert the life cycle into approximate number of years based on research literature.

The DEP Advantage

- Rapid generation of hexahedral element mesh using DEP MeshWorks 'Hexa-Meshing' tool. “Hex Mesh Quality Improvement” tool in DEP MeshWorks helps optimize quality of the Hex Mesh very quickly.
- Hexahedral meshes provide better accuracy of results as compared to tetrahedral mesh.
- The Morpher functionality in the DEP MeshWorks allows for morphing the mesh to different sizes. For e.g. the male leg model can be morphed to a female model using DEP MeshWorks, hence reducing the need to manually develop meshes for different models.
- Using a single software, we are able to generate a hexahedral mesh and also use the morphing functionality.

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www.depusa.com