Topology Optimization of Uprights

With Altair Inspire 2019
Lightweight of FSTW

Development of weight

 Mass [kg] vs. Year


Mass decreases over time from approximately 260 kg in 2012 to about 150 kg in 2018.
Lightweight of FSTW

➢ Our Stinger is the lightest 4-Cylinder car on Events in Formula Student
  ➢ Use of CFRP where it's possible
  ➢ High amount of self-developed and manufactured parts
  ➢ Design in Creo Parametric and FEM analysis with Creo Simulate
➢ Next: Use of topology optimization for more and complex parts
Requirements

• Provided access of software and licenses
• Easy use of modeling, setup, tools and program settings
• Interface to Creo Parametric
• Simple and clever tool to create a part based on the optimization result

✓ Altair provides a license that can be used by several team members
✓ Simple layout and good help tool
✓ Ability to open .prt models directly
✓ Integrated Polynurbs tool

Given that we have only 3-4 months to develop a car, the software we use should be easy to use. Inspire does this perfectly.
Uprights Stinger 19C

Topology optimization with Inspire

Creation of a part with polynurbs in Inspire

Export to Creo
Summary

Pros of Altair Inspire
- Easy to learn
- Parallelized and fast
- Interface to Creo with direct import of .prt
- Very helpful Polynurbs tool

Desirable options
- Import of simulation models created in Creo Simulate
- Pause and resume optimization/analysis runs
Thank you for your Support