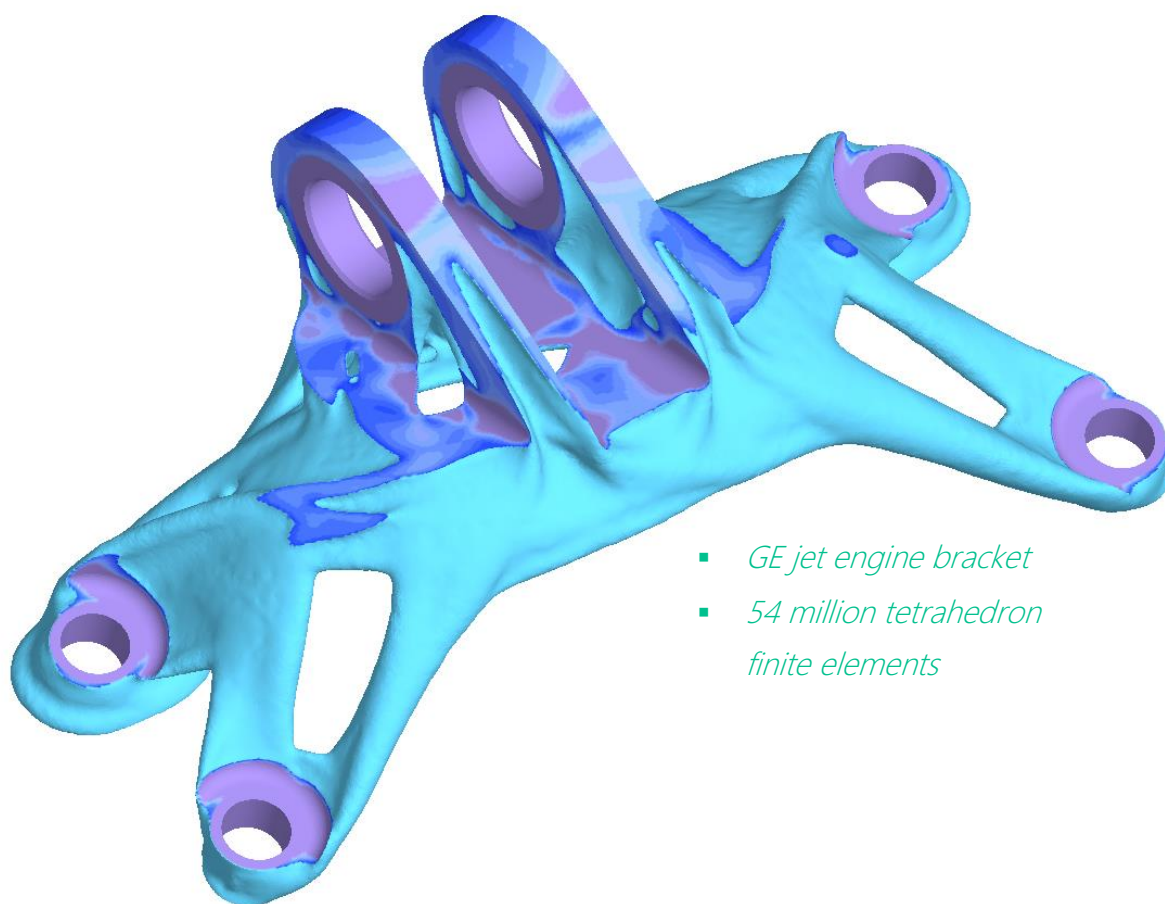


CAESS

## ProTop / ProTopCI

*High performance topology optimization developed by engineers for engineers ...*

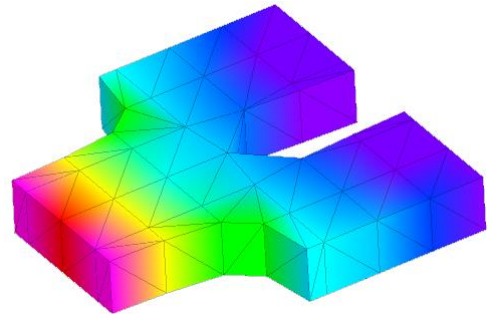
- *GE jet engine bracket*
- *54 million tetrahedron finite elements*



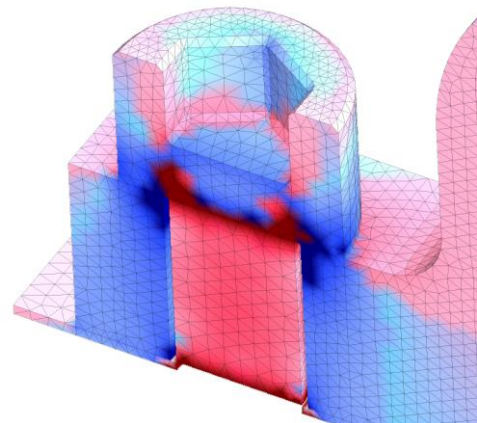
CAESS ProTop Ver: 3.1.6 Cyc: 145 VolPrt: 12.0  
Date: 02/28/2015 Inp: GE-optimization\_54M.ptop Own: CAESS d.o.o.

## A glance at the technology behind ...

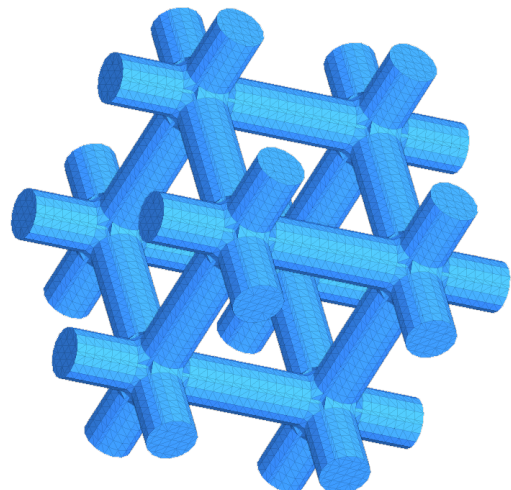
- Specialized custom-coded finite elements
- Hybrid custom-coded evolutionary/level-set optimizer
- High-performance sparse SLE solver
- Only highly parallelized HPC code



- Semi-active elements technology
- Smart Start-from functionality
- Interactive load cases management
- Special semi-contact elements for efficient contact and fastening modeling
- Special semi-plastic elements for better designs

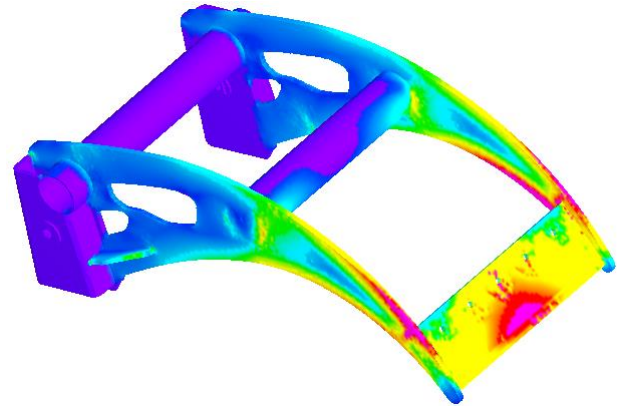


- Unique shell or/and lattice generation and optimization tools
- Numerical shell or lattice generation from solid models – no additional CAD work necessary
- Full 3D (solid finite elements) lattices - immediately ready for optimization with ProTOp/CI



# What ProTop or ProTopCI can do for you ...

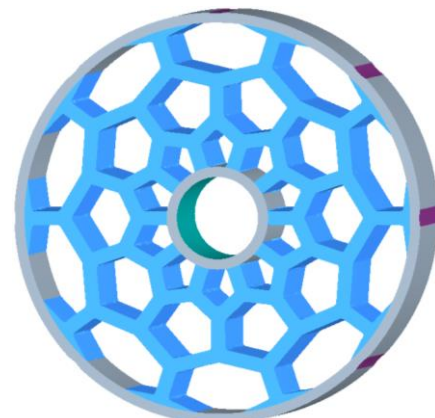
- Find efficiently minimum strain energy designs, exhibiting minimal stresses and removed stress concentrations
- Prolong the life-span and increase fatigue crack resistance of your structural parts
- Reduce the weight and material cost of your products



- Solve efficiently huge multi-million-element models, involving contacts and plasticity if needed
- Deliver high-quality optimized designs
- Smooth and improve the obtained design and export it to popular CAD and 3D printing formats

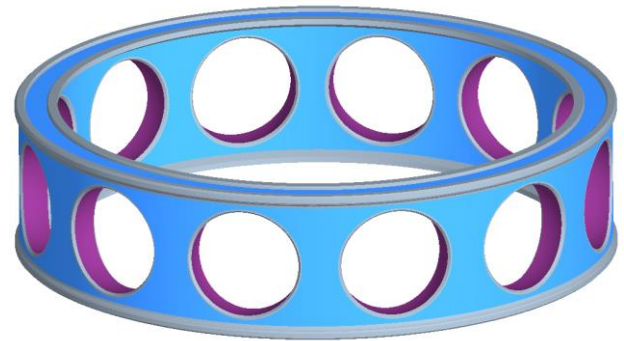


- Create easily innovative shell or/and lattice designs
- Generate and adjust your desired lattice configuration on the fly
- Optimize immediately your lattice structure to remove stress concentrations

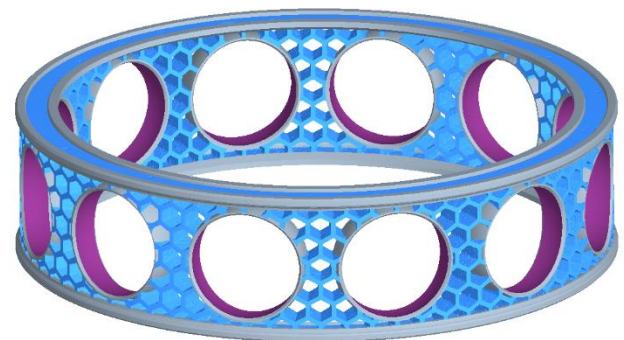


# Lattice structures in ProTop or ProTopCI? Easily ...

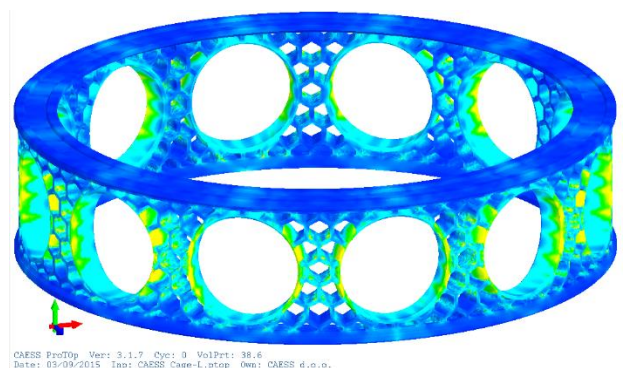
- Prepare the CAD model of your solid part in your favorite modeler
- Apply BCs as usually to define and complete your FEA model
- No need to bother with CAD modeling of a shell or lattice structure



- Import your FEA model into ProTop/CI and select the desired lattice pattern
- Adjust your lattice configuration as desired
- Create any number of additional (different) lattice configurations if needed



- Check quickly your design by running ProTop/CI initialization FEA
- Simply proceed with optimization cycles to improve the design and remove stress concentrations
- Engage ProTop/CI export tools to smooth and export your design



# ProTOp or ProTOpCI? Which suits me best ...

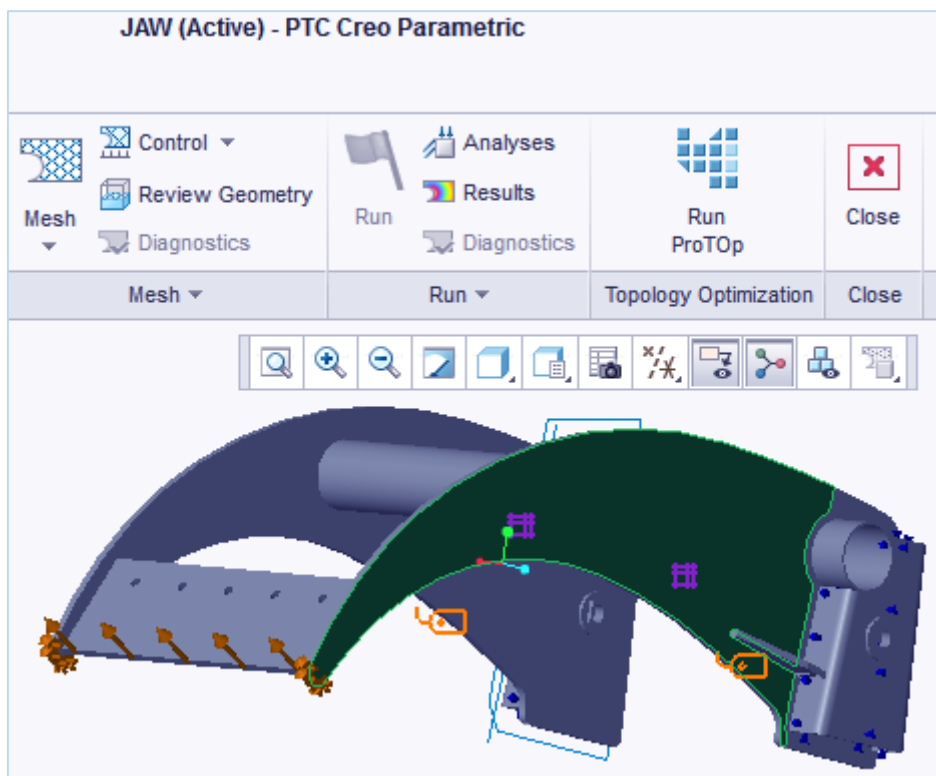
ProTOp and ProTOpCI share the same numerical procedures, making them the same in the computational sense. The only differences are related to their import capabilities and interfacing features, as indicated in the following table:

## *Differences between ProTOp and ProTOpCI*

	ProTOp	ProTopCI
FEA model import from:	<ul style="list-style-type: none"><li>▪ PTC Creo® FNF file</li><li>▪ Simulia® Abaqus INP file</li><li>▪ SolidWorks® Simulation INP file</li></ul>	<ul style="list-style-type: none"><li>▪ PTC Creo® FNF file</li></ul>
Integration plug-in for:	<ul style="list-style-type: none"><li>▪ PTC Creo®</li></ul>	<ul style="list-style-type: none"><li>▪ PTC Creo®</li></ul>

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*Simulia* and *SolidWorks* are registered trademarks of Dassault Systemes or its subsidiaries in the USA and/or other countries..



# Contact us at...

info@caess.eu

*We will be glad to discuss your needs and we will do our best to fulfill your expectations.*

Our location within Slovenia



and Europe



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