MAKE THINGS BETTER

COSMOPROJECTOR

HIGHLY EFFECTIVE 3D DESIGN WITH STRUCTURAL OPTIMIZATION

You need more durable elements?
You need to design new complex component?
Your constructions are too heavy or too complex?

FULL STRUCTURAL OPTIMIZATION IN JUST ONE STEP

initial domain definition not required
separate synthesis and analysis phases not needed
size, shape and topology optimization simultaneously
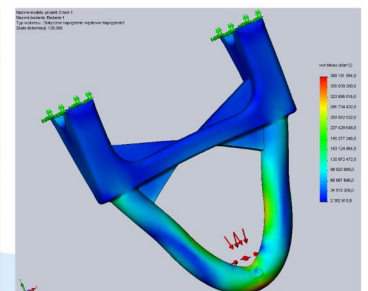
COSMOPROJECTOR KEY PROS

shorter design process of complex objects
optimal bearing capacity / weight ratio
full support for multiload cases
shapes, not achievable with traditional methods

WHAT CAN WE OFFER

new construction design
optimization of existing design
standalone optimization software
optimization plug-ins
expert support

RE-DESIGN EXAMPLE: PARATROOPER SHACKLE

The element was excessively exposed to overloading.
Thebiomimetic optimization of the shackle results in the new
form of the element and after taking into account manufacturing
constraints the stress was reduced below the assumed level.

RESOLV3D

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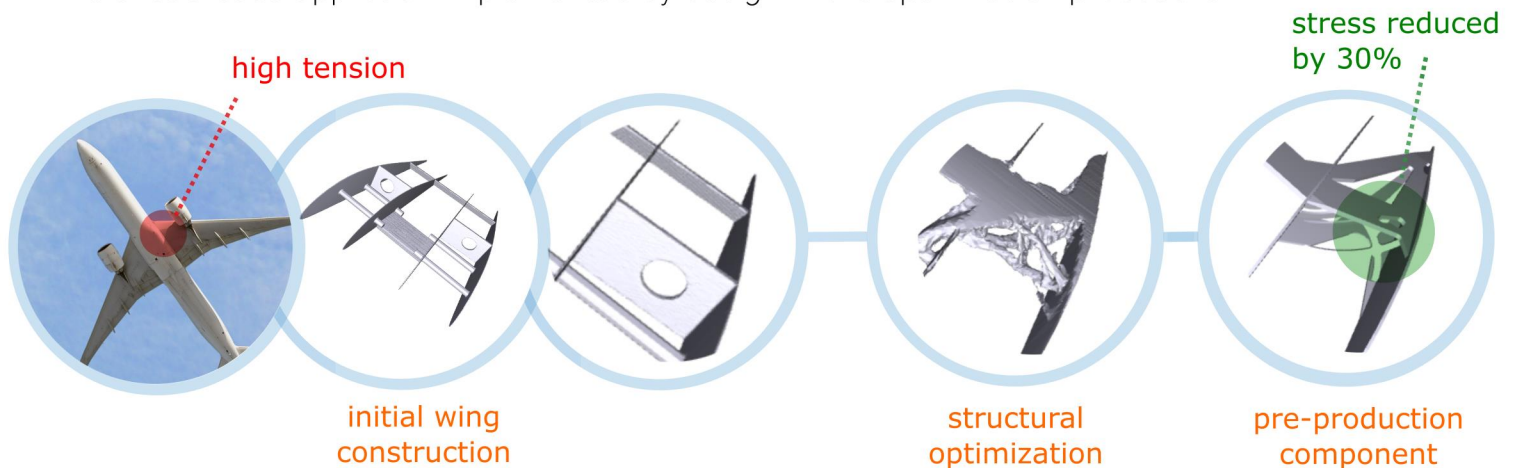
BIOMIMETIC OPTIMIZATION - NEW APPROACH TO STRUCTURAL DESIGN

The biomimetic optimization method reflects the real process of trabecular **bone remodeling** that leads naturally to a lightweight structure with a very high strength. Our solution joins in one procedure **optimization of size, shape and topology.** The unique method allows to achieve identical results as using the classic SIMP method, however gives additional benefits that greatly increase the imagination of the designer and design office productivity.
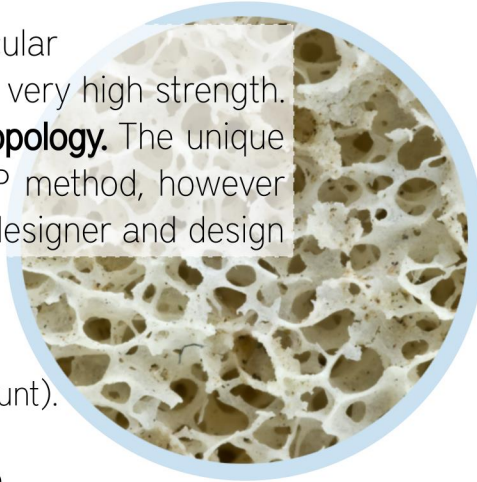
Data required as an input to the procedure: the material strength, the constraints and load (many load conditions might be taken into account). The procedure leads to equalize the strain energy density on the surface of the evolving structure – what is the condition to achieve the stiffest design.

- no need for the domain definition (start optimizing from the existing solution)
- enhancing existing solutions and functional configuration during the optimization process
- the strength assumption concerns the properties of the material, not its amount
- accurate to the adopted load allows the simultaneous optimization of size, shape and topology in a one numeric procedure
- multi load-case approach implemented by design in the optimization procedure

high tension

stress reduced by 30%

initial wing construction

structural optimization

pre-production component

Let us ask the nature how to solve your construction problems

TEAM AND THE COMPETENCES

The Biomimetics Team explores the new research area joining biology and technical aspects (engineering). With close cooperation with Resolv3d company, an University Spin-off, is developing algorithms for topology optimization and integration of existing codes and methods into the area of CFD and multidisciplinary problems like aeroelasticity (AE).

Reduced Order Modelling

Topology Optimization

Virtual Engineering

CFD

Biomechanics

Aeroelasticity

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