Generative Design

Dramatically improve product development and production planning through the use of Integrated Design, Simulation, and Optimization



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Disrupting Legacy Design Approach

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From Computer Assisted ... to Cognitive Augmented Design

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 1980
 1990
 2000
 2015



Standard Workflow for Topology Optimization

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Distinct worlds of **Design**, **Simulation** and **Optimization**:

- No digital continuity
- Several software
- Different users



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What do we propose ?

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Design Engineer Role: Function Driven Generative Designer (GDE)

Unifying Design, Simulation and Optimization in one single app:

- Digital Continuity
- Intuitive Workflow to democratize Topology Optimization
- Automatic Solid Generation from simulation results
- Seamless Collaboration accross disciplines

Product Engineers



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Lightweight Engineering integrated Workflow

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Lightweight Engineering integrated Workflow

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Assembly Multi Part Optimization with Generative Design

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Design Space Definition

Optimization Results Preview

Conceptual Shape Generation

Shape Validation



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Generate Concept Shape : one click from the simulation

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- Exact geometry (Brep) generated with high Surface quality
 - Automating the post-processing from Topology Optimization
 - Conceptual Shapes are obtained in minutes
 - Editable geometry with traditional CAD modeling tools
 - Ability to integrate the concept shape in DMU





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Design Space		Heren
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Improved Smoothing		
Simple Smoothing	Improved	Smoothing
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Generate Concept Shape		
OK	Cancel	



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Generative Design for Subtractive Manufacturing

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Dedicated Milling reconstruction assistant to speed up the generation of the feature-based design of Milled Parts from Generative Design







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Generative Design for Additive Manufacturing

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Dedicated Subdivision Surface tools combined with advanced feature based modelling to speed up the generation of the freeform design of Additive Parts from Generative Design, respecting the Geometrical contraints (Design Space and Functional Regions)







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Generative Design for Additive Manufacturing : Lattice

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Define the infill area and Motif

Blending Brep and Polyhedral geometry





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Beyond Generative Design Integrating Manufacturing and process simulation

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