Peregrine

STRUCTURAL OPTIMIZATION FOR GRASSHOPPER

PEREGRINE

Peregrine utilises state-of-the-art structural optimization technology to help automatically identify and refine highly efficient truss layouts.

Explore low-volume, carbon efficient designs and make confident, informed decisions from inside the Grasshopper modelling environment.

DO MORE, WITH LESS

Peregrine generates highly efficient truss layouts, minimising material use and supporting low-volume, carbon-conscious designs. By optimising both geometry and material distribution, engineers can produce cost-effective structures that meet performance requirements without extensive manual calculations or repeated trial and error.

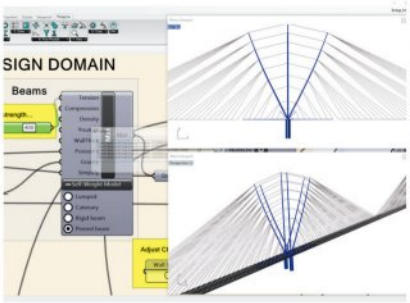
Highly optimal conceptual design solutions can be obtained in seconds, with these readily transformable into more practical designs using a range of inbuilt tools.

DESIGN EXPLORATION

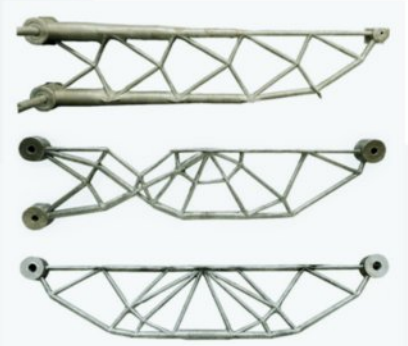
Working directly within Grasshopper, Peregrine enables real-time parametric iteration. Engineers can quickly explore varying geometries, loading conditions, and constraint scenarios, adjusting designs almost instantly. This seamless integration allows rapid evaluation of alternative solutions and supports informed decision-making early in the design process.

PERFORMANCE & WORKFLOW

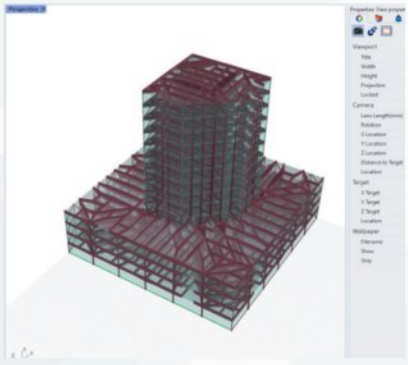
Peregrine ensures that all generated truss layouts meet the strength requirements, while utilizing the minimum volume of material. The software provides a clear path from conceptual design through detailing and on to fabrication. Engineers can be confident that solutions are practical, constructable, and ready to progress from model to real-world application.



Exploration of conceptual design options for cable-stayed bridge using Peregrine



Peregrine optimized truss designs, manufactured using WAAM 3D printing (courtesy of MX3D)



Holistic building optimization, including beam grillages and bracing

www.limitstate.com/peregrine

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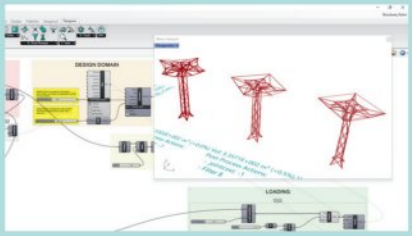
STRUCTURAL OPTIMIZATION FOR GRASSHOPPER

DEFINE

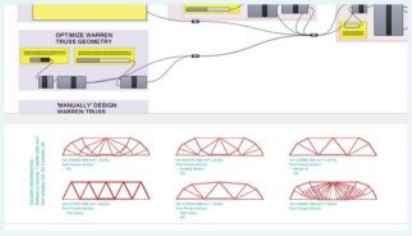
- Ideal for early-stage structural design exploration
- Intuitive setup for rapid model creation
- Streamlined workflow: Define > Optimise > Evaluate
- Needs only basic material property inputs
- Supports holistic building and beam grillage design
- Handles cable stayed & bridge structures
- Integrates seamlessly within Grasshopper workflows

OPTIMIZE



- Layout optimization quickly establishes a baseline design
- Geometry optimization stage reduces volume & complexity
- Accounts for Euler buckling and global stability
- Parametric modelling enables rapid exploration of solutions
- Evaluates multiple load cases efficiently
- Supports load/support symmetry and antisymmetry constraints
- Filter elements and simplify solutions with ease

EVALUATE



- Explore 'what if' scenarios and understand key effects
- Export optimized model geometry in multiple formats
- Compare a range of design options, side by side
- Gain deeper insights into lightweight structural forms
- Quickly develop efficient truss concepts
- Learn from data-driven insights to inform decisions
- Communicate design intent with clear visual outputs

ABOUT LIMITSTATE

We specialize in the development of powerful, yet easy-to-use software tools for civil and structural engineers.

Our expert support team are on hand for swift assistance with technical and licensing queries.

From independent firms to multinational corporations, engineers in over 30 countries around the world rely on our software.

GET STARTED TODAY

Bring structural optimisation straight into your Grasshopper workflow. Peregrine lets you rapidly explore low-volume, carbon-efficient truss layouts directly within Grasshopper, saving time and unlocking new design possibilities.

Scan the QR to download Peregrine & start generating high-performance truss solutions.

Grasshopper

DOWNLOAD

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