Rhino 3D zine

JULY-AUGUST 2024

The Phoresy Pack: A Breakthrough in Ergonomic Design

Introducing the True North 39 Outboard Express: Catalina Yachts' Modern Classic

Voortdurend Bench: A Masterpiece in Houthavenpark Amsterdam

Future Landscape Trust: An Environmental Design Project in Sussex

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Rhino3Dzine

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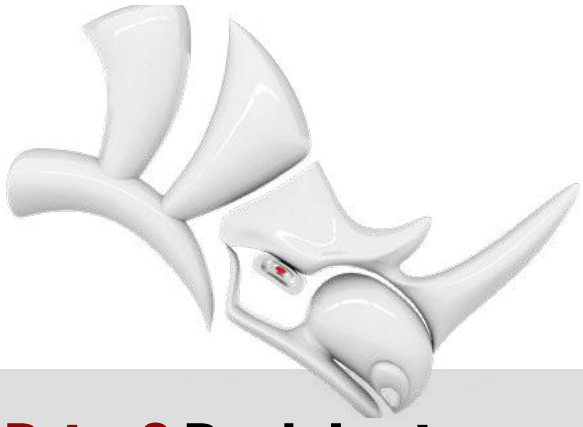

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Contributors & Acknoledgments

EDITOR

Carola Trozzo

REVIEW TEAM

Andrés González, Jackie Nasser, Ryan Brown, Dulce Chavez, Wendy Hemmelman, and Jody Mills.

PRODUCTION MANAGER

Paula González

MARKETING COORDINATOR

Lucia Miguel

OTHER CONTRIBUTORS

Elham Ghabouli, Yannick Christiaens, Stepan Drunks, Simon Vorhammer, Jon Ames, Gijs de Zwart, and Scott Davidson.

ACKNOWLEDGMENTS

- **Future Landscape Trust, An Environmental Design Project in Sussex**

Design: Landplanner and Green Curves Design / Plugin Development: RhinoLands

- **The Phoresy Pack, A Breakthrough in Ergonomic Design**

Design: Stepan Drunks

- **Arloize, Turning Wood Scraps into Personalized Clocks**

Student: Ward Sabbe / Supervising Teachers: Dr. Ing. Davy Parmentier and Ing. Yannick Christiaens / School: Ghent University, Faculty of Engineering and Architecture

- **An Innovative Exhibition Stand at CES 2020 by S. Vorhammer & Atelier Grande**

Client: Blickfeld / Design: Vorhammer & Atelier Grande

- **Introducing the True North 39 Outboard Express, Catalina Yachts' Modern Classic**

Design and Development: Jon Ames, Dale Howel, Kim Loung, David Teichman, Chris Muth, and the engineering team at Catalina Yachts

- **Voortdurend Bench, A Masterpiece in Houthavenpark Amsterdam**

Design: Marjet Wessels Boer / Development: Gijs de Zwartand STUDIOGIJS

IMAGES

rhinolands.com (p. 4-5); Renata Garipova and Timofey Sherstennikov (p. 8-9); Yannick Christiaens (p. 12-13); rhino3d.com (p. 14); Simon Vorhammer (p. 16-17); Jon Ames (18-19); https://events.food4rhino.com, internationaldesignconference.com (p. 20); Gijs de Zwart (p.22-23)

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The True North 39 Outboard Express by Catalina Yachts (p.18-19)

CONTACT US

carola@mcneel.com
jackie@mcneel.com

CORRECTIONS

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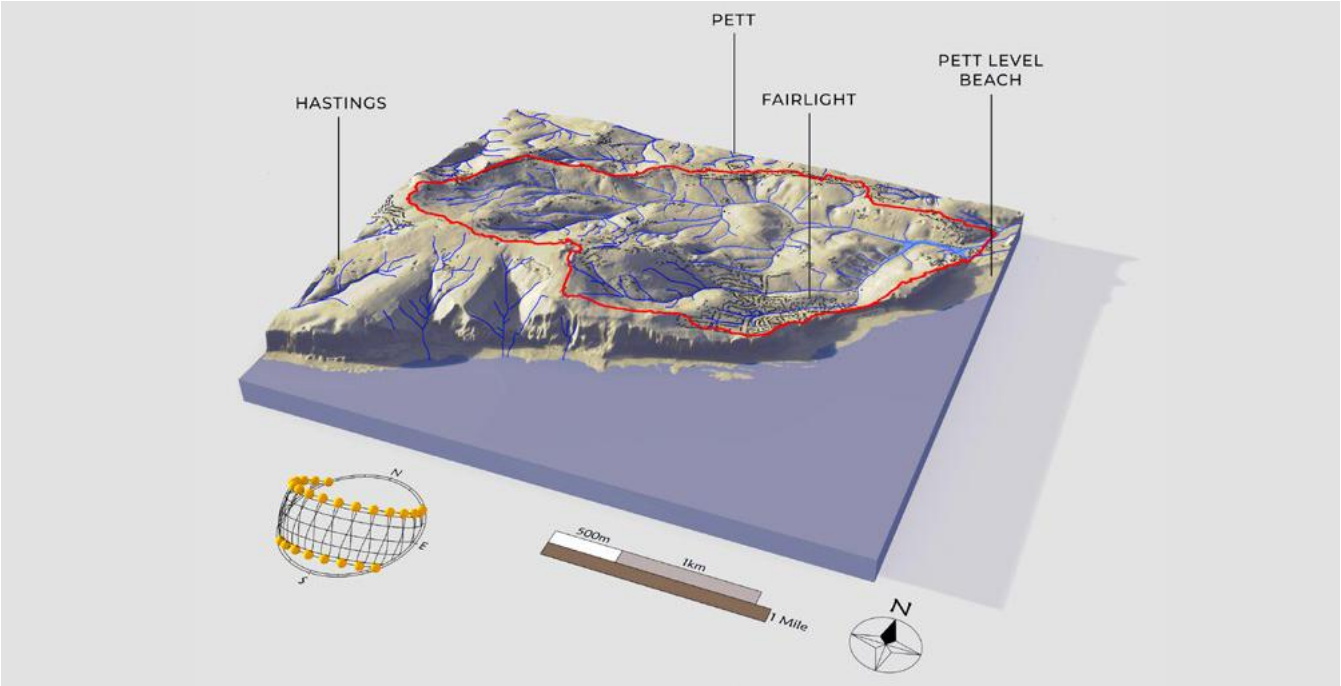
Future Landscape Trust: An Environmental Design Project in Sussex

PLUGIN PROJECT



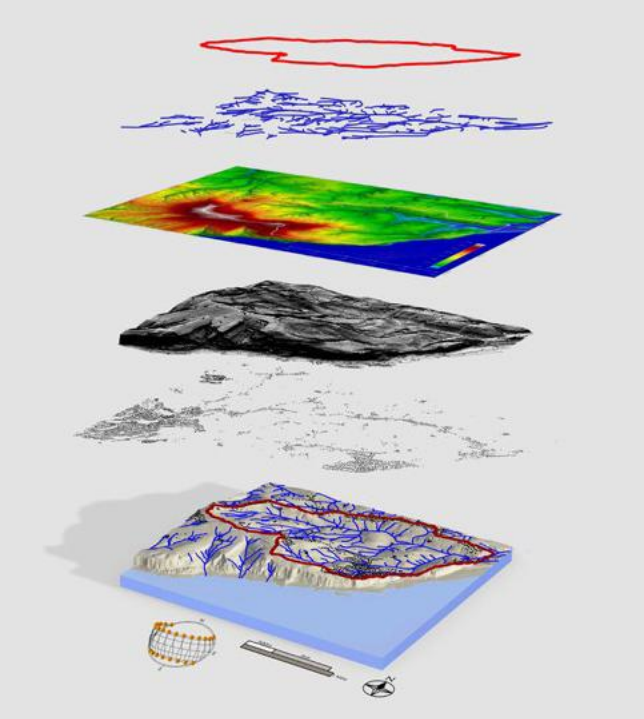
The Future Landscape Trust, in collaboration with Green Curves Design and Landplanner, has launched the Future Trust project to mitigate flooding in Pett Level, East Sussex. Covering 797 hectares, this initiative addresses the village's increasing flood risk, worsened by climate changes. The project uses regenerative, nature-based solutions to enhance flood resilience while providing environmental, societal, and ecological benefits.

Central to the project is **RhinoLands**, a specialized software for landscape design that uses BIM technology. RhinoLands offers tools for 2D technical drawings, 3D modeling, and photorealistic imagery. Features such as terrain importation and an extensive plant database were invaluable in planning and modeling.

A comprehensive topographic survey and flood analysis was conducted. This enabled effective interventions, like enhancing ground cover to improve water absorption and constructing mini "leaky dams" to retain water during heavy rains.

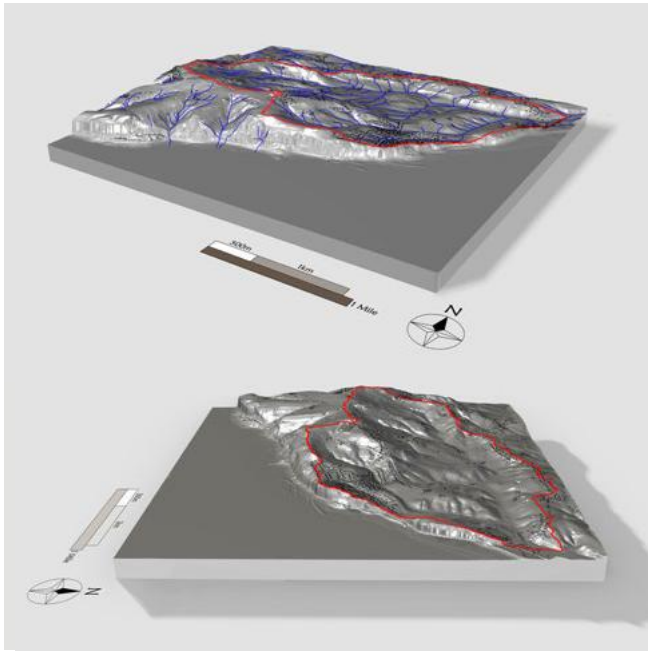
RhinoLands facilitated the creation of accurate 3D watershed models, including waterline indications to illustrate drainage basin concepts. These models were crucial for visualizing the terrain and proposed interventions, aiding communication with stakeholders. Integration with **Grasshopper** allowed advanced parametric design and analysis, streamlining the complex task of modeling natural landscapes and hydrological dynamics.

The project also used **QGIS**, **Ladybug**, and **Photoshop** to model, analyze, and visualize design interventions. These tools supported the creation of 3D map visuals and remote models using high-resolution public data topography, ensuring precise planning.



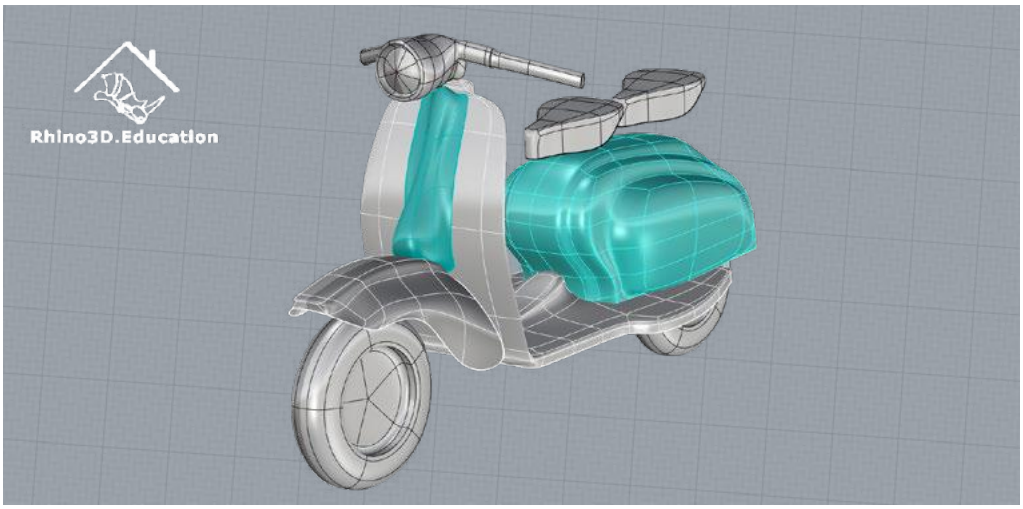
Community engagement was vital to the Future Trust project. Partners included the Marsham Brook Lane Residents Association, the RSPCA, local parish councils, High Weald National Landscape, the South East Rivers Trust, Southern Water, and the Environment Agency. This collaboration ensured that solutions were technically sound and met local stakeholders' needs.

Despite challenges in managing complex hydrological data and incorporating community inputs, the project team navigated these hurdles using sophisticated software applications. RhinoLands was crucial in achieving the project's goals, demonstrating how advanced landscape design tools can address environmental challenges.



The Future Trust project showcases the power of technology and community collaboration in creating sustainable and resilient environments. Protecting Pett Level from future floods sets a precedent for similar initiatives in other vulnerable coastal regions, highlighting the potential of innovative landscape design in environmental management.

Step by step intro to SubD in Rhino 7 and 8



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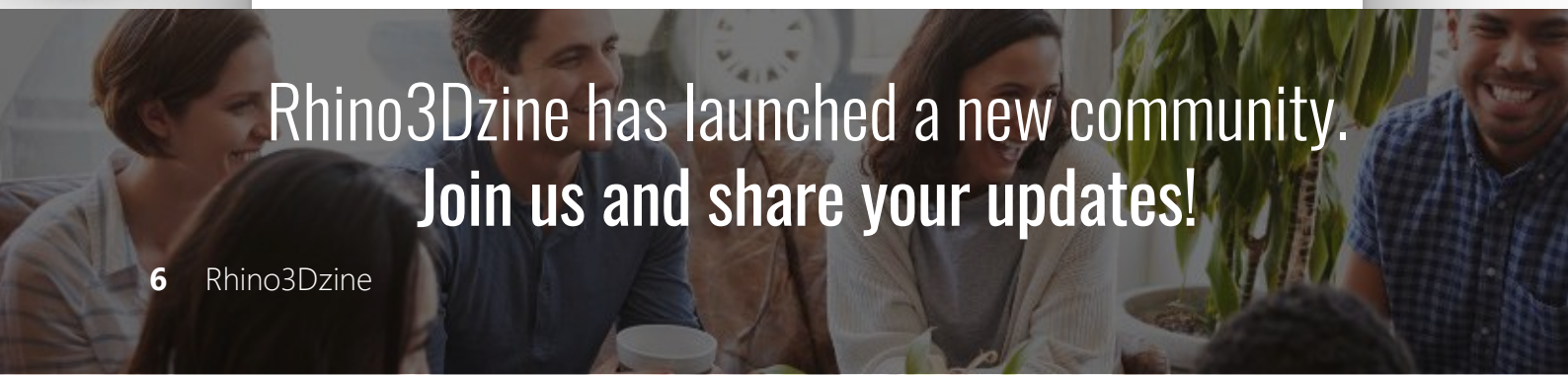
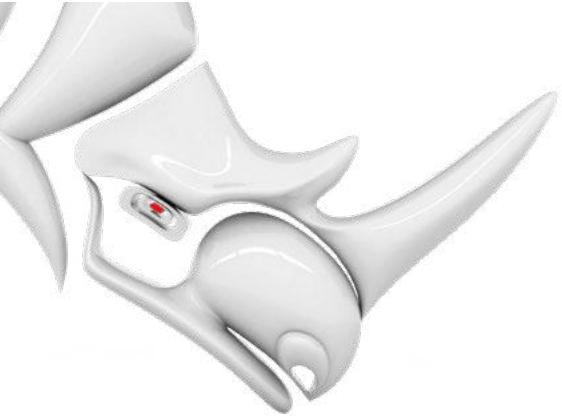




Tips & Tricks

Elevate Your Rhino Game: Think you know it all? Click now and unravel a collection of game-changing tips & tricks!

Boolean Union
Rhino 7+

Boolean Intersection
Rhino 7+

Shell Closed Polysurface
Rhino 7+

Create Solid
Rhino 7+

Boolean Difference
Rhino 7+

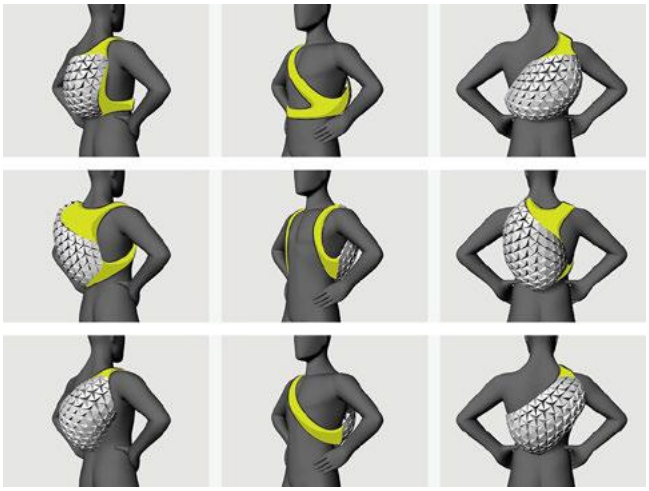
Boolean Split
Rhino 7+

The Phoresy Pack: A Breakthrough in Ergonomic Design

FASHION DESIGN

The Phoresy Pack, an innovative ergonomic backpack designed by award-winning multidisciplinary designer Stepan Drunks, showcases the potential of parametric design in fashion and industrial applications. Crafted from a single sheet of CNC-milled and folded genuine leather, features a structure that dynamically adjusts to the volume of its contents, expanding and contracting as needed.

Drawing inspiration from the foldable tessellation patterns developed by mathematicians like Ron Resch and the computational design principles of architects such as Zaha Hadid, the Phoresy Pack marries traditional leather craftsmanship with modern technology. Influences also include pioneering designs like the Meiosis backpack by Davidi Gilad and the Solid Gray backpack.



The Phoresy Pack is produced using various types of natural cowhide leather. The back shell, made from blue-dyed leather, is milled on a CNC router to create precise crease patterns, while a layer of Spandex adds elasticity, enabling the bag to lay flat when empty. A special varnish gives the leather a glossy, watertight finish and ensures it adheres perfectly to the vacuum table during the milling process.

One of the key design challenges was the use of unconventional production techniques. While some processes adhered to traditional leatherworking methods, others, such as CNC milling cowhide leather, were developed specifically for this project. The design's most distinctive feature—a backside crafted from a single leather sheet—required a highly iterative prototyping process, as any manufacturing defects necessitated starting over. The use of **Grasshopper** was instrumental in generating the backpack's overall shape and simulating the leather's folding and deformation.

Despite its sophisticated design, the Phoresy Pack remains user-friendly, featuring a single large compartment that naturally adjusts to the contents' volume. It measures approximately 500 x 320 x 200 mm, offering a total volume of 15 liters, and compresses to a smaller size when empty.

Developed as Stepan's degree thesis, the project debuted at the British Higher School of Art and Design's End of the Year exhibition in 2015. The Phoresy Pack exemplifies the intersection of traditional craftsmanship and cutting-edge design technology, pushing the boundaries of what a backpack can be while also fostering local craftsmanship and innovation.

For more innovative designs and projects by Stepan Drunks, visit **his personal website**.

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Book Discoveries

CAD.GH Computational Aided Design Via Grasshopper by Abdulwahab Alosaj

Step into the captivating world of computational design guided by Abdulwahab Alosaj's comprehensive expertise. Through his role as an instructor at Ajman University - UAE, Alosaj illuminates the potential of **Grasshopper**, intricately interwoven with **Rhinoceros**. Within these pages, readers are introduced to an array of essential plugins, from Kangaroo to Ladybug tools, each unlocking new dimensions of design exploration. Dive deep into a landscape where creativity knows no bounds; where complex geometries, dynamic patterns, and adaptive structures are not just concepts but tangible creations realized through Grasshopper's algorithmic processes. Alosaj's adeptness seamlessly marries coding with Grasshopper's default tools, providing seasoned professionals and aspiring designers alike with the tools to transcend conventional boundaries in architectural exploration. This invaluable resource not only promises to ignite innovation but also elevates design practices and inspires unparalleled creativity in the ever-evolving landscape of computational design.

get it now

Arloize: Turning Wood Scraps into Personalized Clocks

ACADEMIC PROJECT

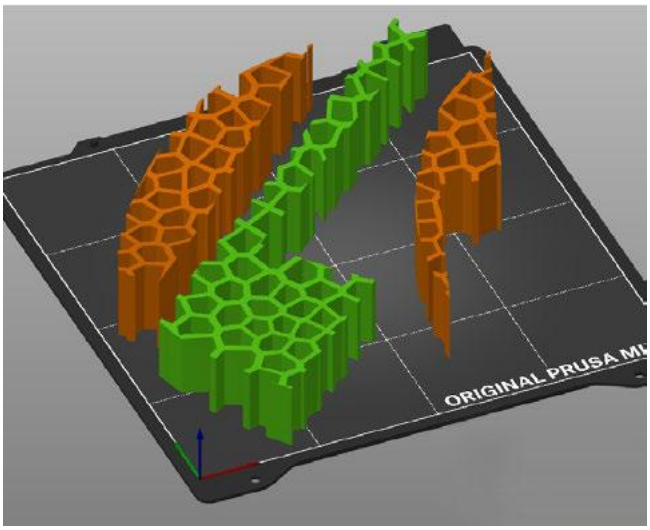
The Arloize project, spearheaded by student Ward Sabbe under the guidance of Dr. Ing. Davy Parmentier and Ing. Yannick Christiaens at Ghent University, tackles the issue of wood waste in the woodworking industry. This innovative endeavor utilizes the Grasshopper program to transform leftover wood pieces into customizable clocks.

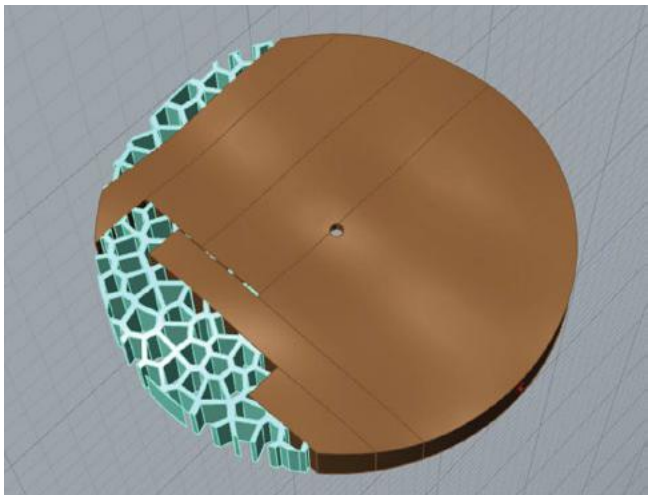
Often, woodworkers face the dilemma of disposing of small or aesthetically flawed offcuts, which are generally deemed unusable. The Arloize project was born out of the frustration of seeing unique wood pieces discarded. With the assignment to create an object using Rhino and Grasshopper in the "Design for Advanced Manufacturing Techniques & Environments" course, Ward Sabbe saw an opportunity to address this problem while designing a functional clock.

Arloize uses Grasshopper's parametric capabilities to allow users to dictate the clock's size, shape, and features. The process begins by defining the main shape with

customizable parameters such as diameter and thickness. Next, leftover wood pieces are sorted and filtered. Pieces that are too large or small are excluded, ensuring safety and compatibility with CNC machinery.

Once sorted, these pieces are arranged using the **OpenNest** plugin, which optimizes the layout of the wood fragments to create a cohesive structure. The clock's aesthetic is further enhanced by an organic wave pattern, which is generated by manipulating points in a plane to create a dynamic yet harmonious appearance. Any gaps in the wood structure are filled with a Voronoi pattern, adding a unique, organic feel to the design.





The project leverages accessible production methods like CNC milling and 3D printing, which have become more available to hobbyists and maker spaces. This approach not only keeps costs low but also supports local production, ensuring that anyone can create their own Arloize clock. The project provides detailed guidance on using these tools, making it easy for individuals to start crafting their personalized clocks.

The Arloize project embodies a sustainable approach to design by repurposing wood waste into functional art. It empowers the maker community with the tools and knowledge to produce unique clocks, blending modern technology with traditional craftsmanship. By addressing wood waste creatively, Arloize not only contributes to environmental sustainability but also fosters local craftsmanship and innovation.

Developers Corner

Hear it from us.

New Grasshopper Types

The latest release of Rhino 8 introduces new data types and components that significantly enhance the capabilities of Grasshopper and Rhino.

Have you ever wished you could bake geometry with custom attributes? Need to add metadata to your designs before production? Or did you face the frustration of losing essential metadata when importing CAD files into Grasshopper? With Grasshopper's new data types, these challenges are a thing of the past.

Grasshopper 1 has always supported common data types like points, curves, breps, booleans, numbers, and text. Now, Rhino Objects, Rhino Layers, Linetypes, Hatches, Materials, Fonts, and Annotation Styles are included as native data types in Grasshopper 1 for Rhino 8.

These new components allow you to get and set the attributes of a given data type. But what exactly is an attribute? An attribute is simply a property or characteristic that defines an object or type, such as Layer, Material, Visibility, UserText, and other metadata.

With these new capabilities, Rhino 8 and Grasshopper are set to revolutionize how designers work, offering greater flexibility and control over their designs.

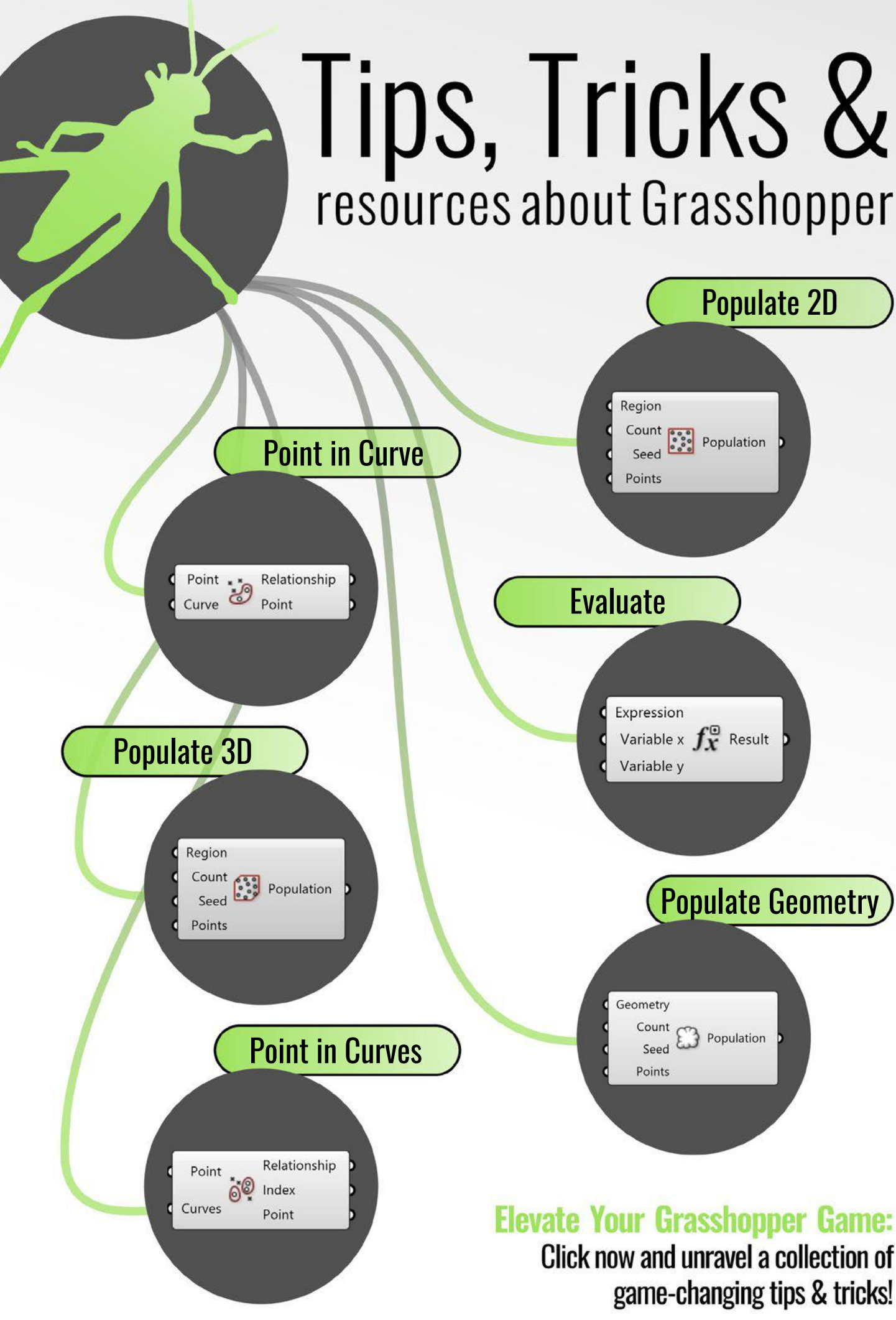
Click to read our guide on the Model Object in Grasshopper

Or click to read other guides about related issues:

- **Group, Filter Sorting Model Objects in Grasshopper**
- **Storing usertext on Model Objects in Grasshopper**
- **Block and instances with Grasshopper**
- **Annotations with Grasshopper**
- **Content Cache, tracking Rhino objects with Grasshopper**

Sincerely,
The McNeel Development Team.

Tips, Tricks & resources about Grasshopper

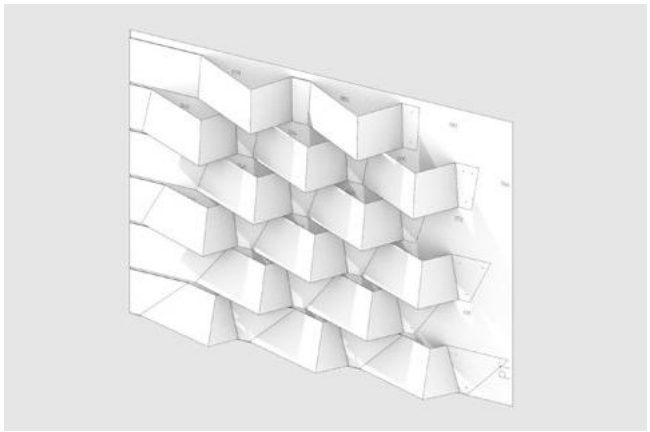


Elevate Your Grasshopper Game:
Click now and unravel a collection of game-changing tips & tricks!

An Innovative Exhibition Stand at CES by Simon Vorhammer & Atelier Grande

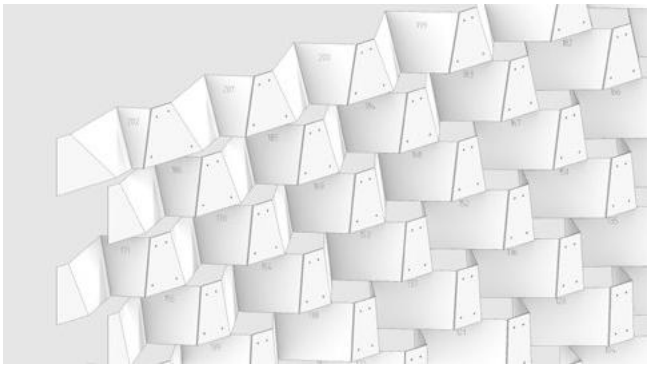
TEMPORARY ARCHITECTURE

At the Consumer Electronics Show (CES) in Las Vegas, **Blickfeld GmbH** made a remarkable debut with a captivating exhibition stand. This temporary architectural marvel, designed by **Simon Vorhammer** & **Atelier Grande**, showcased Blickfeld's innovative spirit and cutting-edge Lidar technology. The Munich-based company found an ingenious way to represent its technological prowess through a visually stunning and interactive installation.



Design Philosophy and Core Features

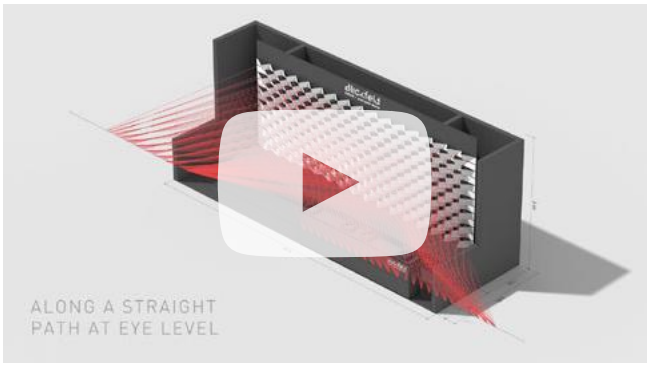
The central feature of the stand was a meticulously designed rear wall comprising 220 individually folded mirror elements. These mirrors were not just decorative; they served a deeper purpose. Each element was aligned along an imaginary line at eye level, creating a dynamic visual experience. As visitors moved along this line, they saw their reflections in a sequence



that changed with their perspective. This clever design echoed the core functional principles of Blickfeld's MEMS Lidar scanners, making the technology's concept accessible and engaging.

Precision and Innovation in Construction

Creating this sophisticated display required advanced tools and techniques. The design process utilized **Rhino** and **Grasshopper** for precise digital modeling. **Kangaroo** was employed for physics simulations, ensuring the structural stability and aesthetic precision of the mirror elements. **OpenNest** optimized the cutting process, crucial for producing the unique shapes needed for each mirror segment.



High-precision CNC production played a vital role in achieving the intricate cuts required. Each mirror element had to fit perfectly in its designated spot, necessitating systematic labeling of the substructure and all segments. This meticulous approach eliminated the need for traditional construction plans, as every piece could only fit in a specific orientation and place, ensuring an error-free assembly process.

Overcoming Assembly Challenges

One of the primary challenges was the tight 48-hour assembly window. The design had to be executed flawlessly, with no visible fixings, to maintain the sleek appearance of the stand. Prefabrication and modular design principles were key to overcoming this hurdle. Grasshopper enabled detailed simulations and adjustments, ensuring that each element would fit perfectly during the quick installation phase.

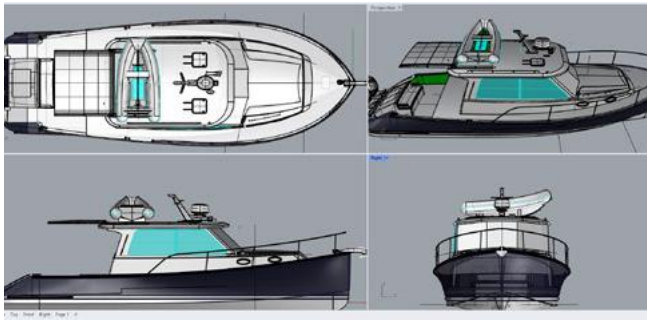
The assembly was designed to be reversible, allowing for easy disassembly and reuse. Blickfeld's trade fair team carried out the assembly seamlessly, showcasing their efficiency and attention to detail. This method not only saved time but also demonstrated the practicality and sophistication of modular design in temporary architecture.

The exhibition stand by Vorhammer & Atelier Grande for Blickfeld at CES 2020 was a striking example of how innovative design can bring advanced technology to life. By integrating the principles of Lidar technology into the very fabric of the stand, the designers created an engaging and educational experience for visitors. This project exemplifies the potential of temporary architecture to make a lasting impression, merging aesthetic appeal with functional brilliance.

Introducing the True North 39 Outboard Express: Catalina Yachts' Modern Classic

NAVAL DESIGN

Catalina Yachts, renowned for its half-century legacy in the maritime industry, has recently acquired the True North line of Downeast powerboats. This acquisition marks Catalina's entry into a growing market segment and represents a significant evolution in their boat-building portfolio. The latest jewel in their crown is the True North 39 Outboard Express, a modern reimagining of a classic Downeast cruiser.



The True North 39 Outboard Express is a testament to Catalina's commitment to blending tradition with modernity. The design team embarked on an ambitious project to transform a 20-year-old Downeast-style diesel inboard cruiser into a contemporary masterpiece, while retaining its timeless aesthetic and rugged performance.

From the onset, Catalina employed cutting-edge design tools like Rhino to meticulously craft the True North 39. The team started by converting old 2D drawings and photos into a precise 3D model. This model served as the foundation for numerous modifications, including a new hull, deck, pilothouse, and a completely reimagined interior. The integration of modern outboard engines was a pivotal shift, providing enhanced efficiency and speed.

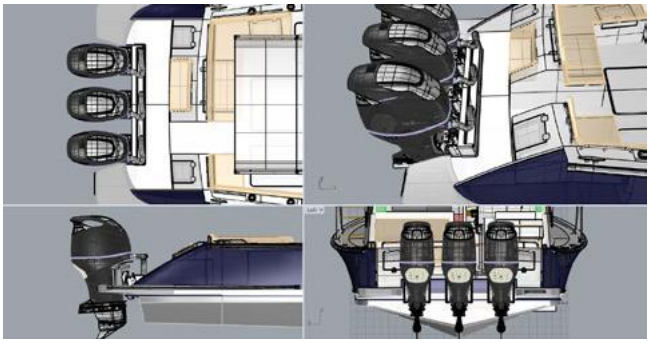
Orca3D and **Flamingo nxt** were instrumental in the naval architecture and rendering processes. These tools allowed the design team to continuously refine the boat's details, ensuring that every aspect met their high standards. The iterative design process was marked by countless revisions, each enhancing the vessel's functionality and aesthetic appeal.

Collaboration played a crucial role in this project. Catalina partnered with industry experts such as Porta Products for engine mounting and Lewmar Lippert for glass and glazing. These collaborations ensured that custom parts manufactured globally would come together perfectly during assembly. Using Rhino across all partners facilitated precise manufacturing and assembly, resulting in a vessel with tight tolerances and exceptional quality.

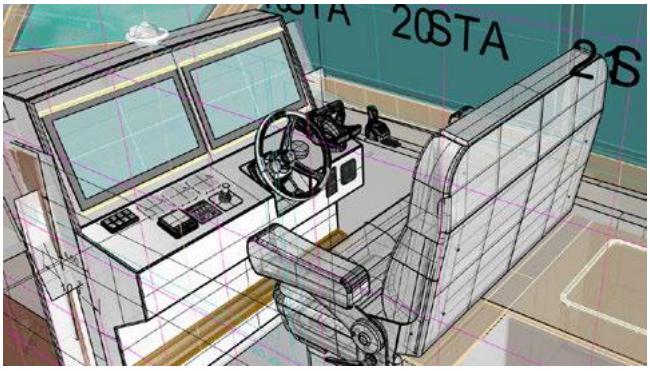
The interior design phase was particularly meticulous. The team created full-scale mock-ups to validate the ergonomic flow and usability of the arrangements. This hands-on approach ensured that the final interior was not only visually appealing but also highly functional. The design was then shared with Bedard Yacht Design for offsite finalization and tooling.

Assembly of the True North 39 is currently underway at Catalina's facility in Largo, Florida, with on-water testing scheduled for July. The boat is set to debut at the Newport International Boat Show and the Fort Lauderdale International Boat Show (FLIBS) this fall, where it is expected to make a significant impression.

The True North 39 Outboard Express encapsulates the rugged, timeless Downeast aesthetic while delivering modern performance and comfort. Its durable exterior and spacious, open-concept interior offer both functionality and luxury. The boat's design includes direct water access and a "private beach" on the aft deck, features that enhance the boating experience.



As Catalina celebrates 50 years of crafting durable and reliable boats, the True North 39 Outboard Express stands as a beacon of its innovative spirit. This new addition to the Catalina family not only honors the legacy of True North Powerboats but also brings a new level of sophistication and performance to the market. The True North 39 promises to provide countless mariners with memorable adventures and the reliability that Catalina Yachts is known for.



Upcoming Events

Hone Your Skills With Rhino

RHINO + VRAY WORKSHOP

HOSTED BY ESTUDIO AGRAPH - JUL 17-22 2024

The amazing teachers at Studio Agraph are providing an opportunity to get to better know Rhino and it's compatibilities with the V-Ray plugin. Small groups guarantee a rewarding, hands-on learning experience in beautiful Valencia, Spain.

WHERE: Valencia **TIME:** 4P-9PM CEST
COST: EU 290 **LANGUAGE:** English

RHINO FOR ARCHITECTS

HOSTED BY PIVOT INDUSTRIDESIGN - AUG 30, 2024

This is a specialized course for people in the architecture and civil engineering industry. There will be an introduction to Grasshopper and basic use cases for practical modeling tasks for architecture, furniture planning and landscaping.

WHERE: Oslo **TIME:** 9A CEST
COST: EU 880 **LANGUAGE:** English /Norwegian

RHINO SUMMER TEACHER TRAINING

HOSTED BY MCNEEL N.A. - JUL 8-11 2024

Could Rhino provide great benefit to your students? McNeel North America provides free training sessions for educators looking to add 3-D modeling to their design and design communication curriculum. Quick and in-depth workshops are both available.

WHERE: Bothell, WA **TIME:** 8:00 - 16:30 PDT
COST: Free **LANGUAGE:** English

INTERNATIONAL DESIGN CONFERENCE

HOSTED BY IDSA - SEPT 11-13, 2024

This long-standing conference and symposium brings together professionals from all corners of the design world to connect, share knowledge, and expand the vision for the future of design - all over one long weekend in Austin, TX.

WHERE: Austin, TX **TIME:** Varies
COST: USD 1,399 **LANGUAGE:** English

Career Corner:

Job Opportunities with Rhino or Grasshopper

ARCHITECTUAL MODEL BUILDER
ZGF ARCHITECTS

WHO: ZGF is an industry leader in sustainable and regenerative design. They embraced sustainable design as a core value long before “green” or “LEED” became common phrases.

WHAT: Seeking an Architectural Model Builder to join the team at the Los Angeles office. Applicant must be able to produce scale architectural models in a variety of materials and fabrication methods.

more info

PROFESSOR, ENTERTAINMENT DESIGN
SAVANNAH COLLEGE OF ART & DESIGN

WHO: One of the most well-known and well-regarded art and design schools in the world, with campuses in Georgia and France.

WHAT: Seeking an educator with the ability to create models, 3D renders, and quick spatial illustrations for students. Experience with theme park design and Rhino/Revit preferred.

more info

ENVIROMENTAL DESIGNER
TIKTOK

WHO: TikTok is the leading destination for short-form mobile video. At TikTok, the mission is to inspire creativity and bring joy. This position is at the New York City office, though TikTok is a wideranging global brand.

WHAT: Seeking a designer who will be responsible for concepting, rendering, and bringing to life immersive experiences across some of TikTok’s most influential B2B event moments.

more info

URBAN DESIGNER
BOSTON CITY HALL

WHO: The capital and most populous city in Massachusetts, home to nearly 700,000 people.

WHAT: Seeking a designer to contribute to new and ongoing planning and interdepartmental design efforts focused on resilience, affordability, and equity. They will be required to produce analysis, conceptualize ideas, and plan out various urban design scenarios to better the city of Boston.

more info

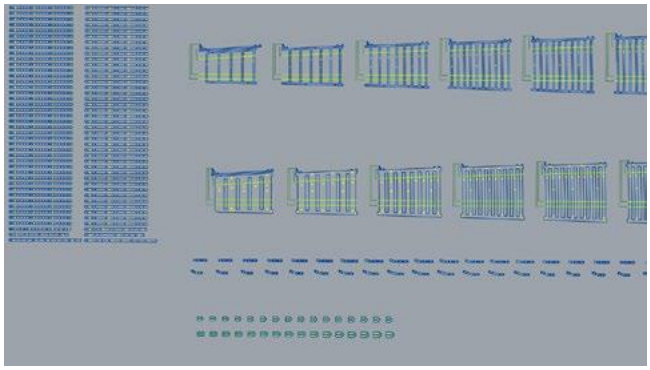
Have a job offer or event? Let us know, and we’ll share it in an upcoming issue.

Voortdurend Bench: A Masterpiece in Houthavenpark Amsterdam

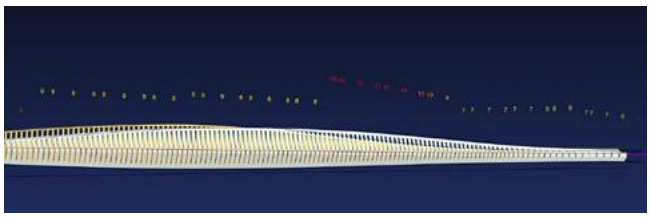
PUBLIC ART

Voortdurend, a 170-meter-long art installation and bench, now graces Houthavenpark in Amsterdam. Designed by Marjet Wessels Boer, this project seamlessly merges art and functionality, offering a visually striking public amenity. The realization of Boer's vision required innovative problem-solving and advanced computational techniques.

STUDIOGIJS, led by Gijs de Zwart, played a crucial role in transforming the original design into a manufacturable product. The project required extensive use of **Rhino** and **Grasshopper**. Each section of the bench was meticulously scripted, with only the five input curves per part left to define its unique shape.



Fully automated generation of 2D drawings with dimensions



Measured distances for the filler blocks

The bench's design is both intricate and dynamic. The backside modules start behind the front parts, align at seating level, and then disappear again, creating a visually engaging pattern when viewed from different angles.

These backsides are tilted at a five-degree angle, adding to the installation's dynamic aesthetic as people walk or cycle past.

One of the major challenges was performing the installation on uneven concrete blocks.

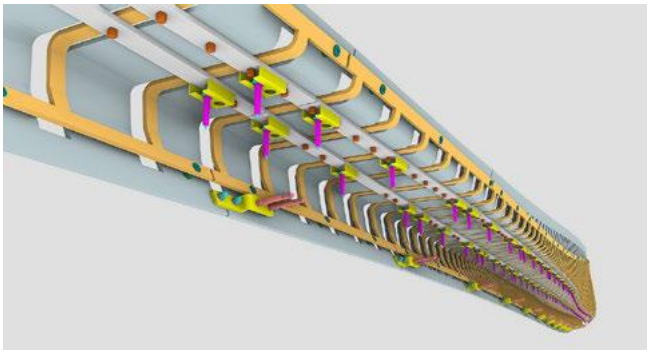
Installation process

Due to the soft sand ground typical of Amsterdam, these blocks varied in height by up to 17 millimeters. Ensuring the bench remained level at seat height was paramount. This was achieved by creating customized filler blocks, tailored to the precise measurements of the concrete bases. Each bench part, approximately one meter in length, required these bespoke supports to maintain the desired continuous form.

Production of the strips with mounted filler blocks

Another significant hurdle was generating accurate 2D production drawings from the 3D model. The 8mm thick laser-cut steel parts required precise bending, which was complicated by the lack of a dedicated sheet metal feature in Rhino. To overcome this, a custom algorithm was developed to account for bend factors, ensuring the parts could be manufactured correctly. Additional extensions were added to facilitate the bending process, which were manually removed before final finishing.

Throughout the project, various plugins enhanced the workflow. **Elefront** was used to manage block items and efficiently bake objects, while **Pterodactyl** aided in documentation. **Telepathy** helped manage and reuse parameters, preventing excessive complexity in the Grasshopper scripts. Despite these tools, the project's complexity demanded a script comprising over 5000 components, taking up to 20 minutes to calculate each bench part fully.



Bottom view showing the different parts involved for each segment

Voortdurend stands as a testament to the power of computational design and the meticulous effort required to bring such an ambitious project to life. It not only enhances the park aesthetically but also serves as a functional piece of public art, demonstrating the successful blend of artistry and engineering.

The Voortdurend installation in Amsterdam

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