

The Carapacks Pavilion: A Hexagonal Innovation

[The Carapacks Pavilion](#), a hexagonal innovation, exemplifies architectural advancement. It resulted from collaborative efforts led by [Simon Vorhammer](#), Dr. Jonas Schikore, Dr. Christina Jeschke, and David Ott. This project, meticulously crafted over multiple semesters at the [Architecture Faculty of Biberach University](#), exemplifies the fusion of creativity, technology, and practicality.



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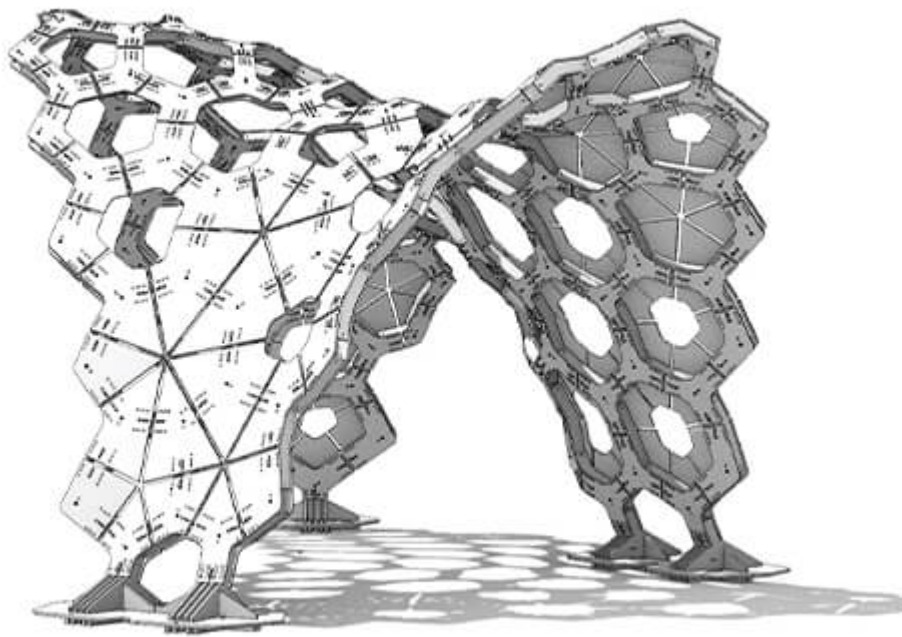
The hexagonal system, devoid of curvature and torsion, enables efficient and cost-effective

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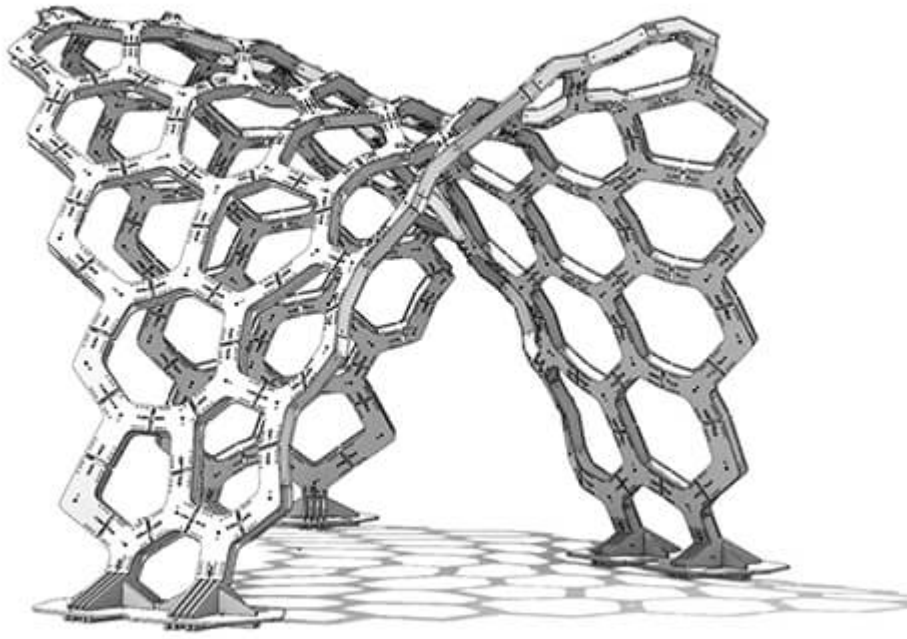
The team employed digital parametric modeling to define various input

parameters, allowing for the rapid generation of manufacturing-ready kits for diverse geometries.

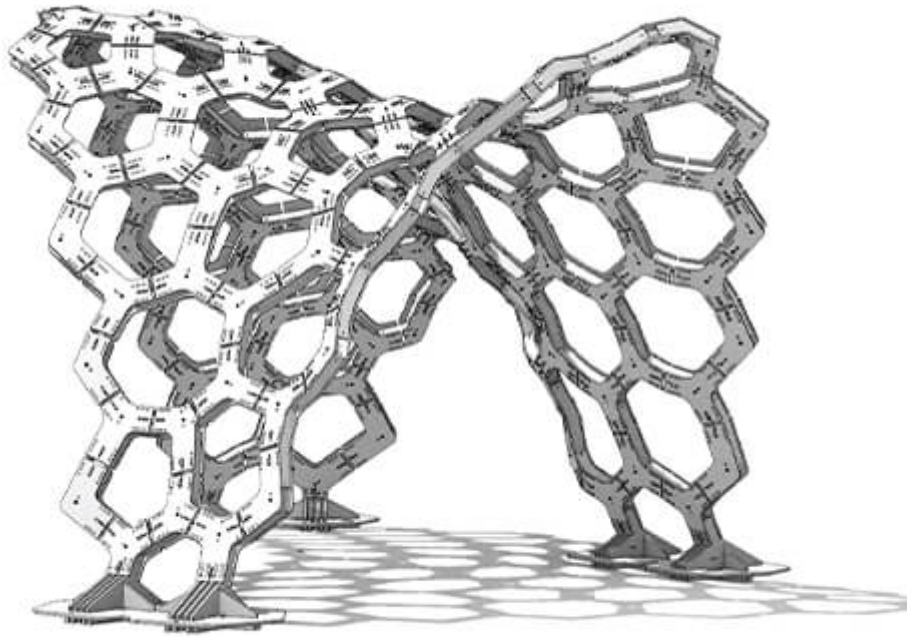
A key feature of Carapacks Pavilion is its straightforward assembly process, requiring no heavy machinery. Each component is meticulously labeled and positioned for easy assembly, similar to solving a puzzle. This approach simplifies construction and facilitates space-saving stacking, with all parts fitting into the trunks of two station wagons. The project faced challenges, such as determining the assembly sequence and addressing issues related to CNC laser cutting, such as soot formation on cut edges. To overcome these obstacles, the team used a hybrid assembly method and post-processing techniques like sanding and priming to improve durability and aesthetic appeal.



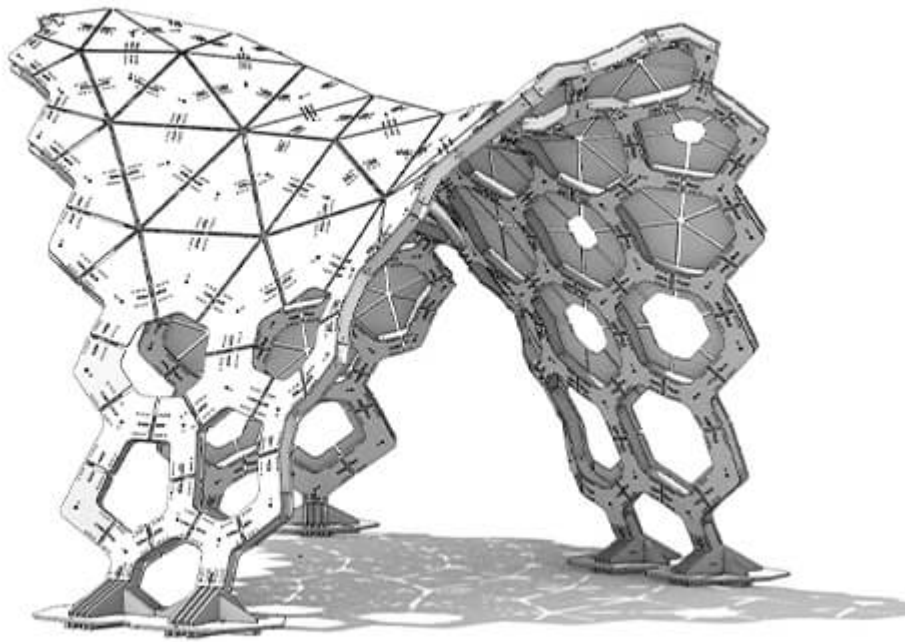
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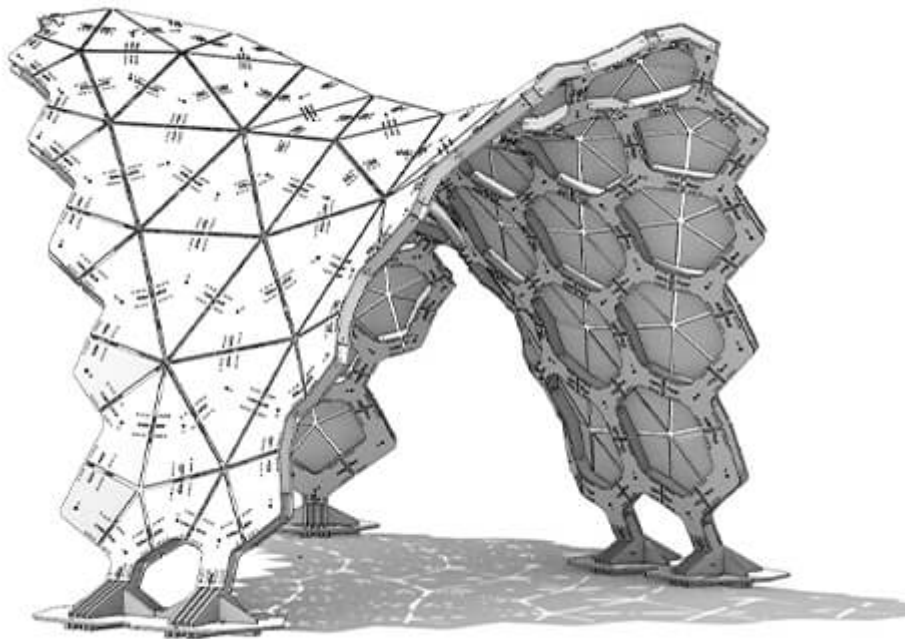
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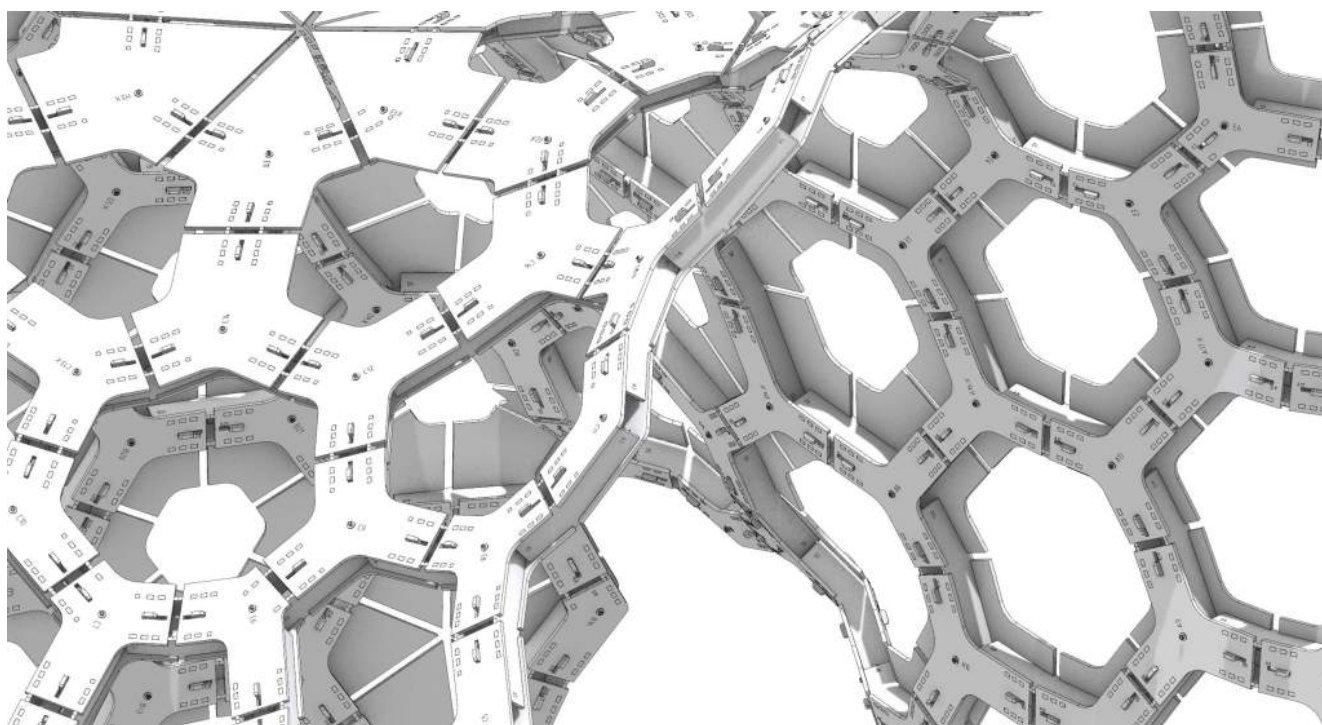
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The successful completion of Carapacks Pavilion relied on utilizing software tools like [Rhino](#) and [Grasshopper](#), alongside plugins such as [Elefront](#), [Human](#), [Pufferfish](#), and [Karamba3D](#).

These digital platforms enabled comprehensive planning, structural analysis, and fabrication of data derivation within a unified digital environment. Additionally, [OpenNest](#) optimized part distribution for CNC cutting, streamlining the manufacturing process.



The structural behavior of Carapacks Pavilion showcases its innovative design approach. The lattice structure, primarily carrying loads within its plane through compressive forces, encourages shell behavior regardless of the loading situation. Parametrically organized dimensioning of rod widths, informed by static analysis, ensures optimal structural integrity while responding to external forces.





Carapacks Pavilion extends beyond its architectural significance to demonstrate the versatility of its design, applicable not only to wooden pavilions but also to roofs and facades. Material durability and weather resistance are paramount considerations, with options ranging from outdoor-grade wood to weather-resistant sheet-like materials.

The project acknowledges the support of its sponsors – Ackermann GmbH, Maurer Holzwerkstoffhandel, and Faust Linoleum – whose contributions were integral to its success. Carapacks Pavilion showcases the transformative potential of architectural exploration and collaboration through innovative design and seamless integration of digital tools.