

Marvin Bratke *Batwing*



BART//BRATKE

studio **DE**
STUDIO FOR DESIGNED
ENVIRONMENTS

Bio:

Marvin Bratke is German architect and designer, currently based in Berlin. He has received his diploma in architecture with distinction at TU Munich in June 2011. His ongoing research and design ambitions are focused on emergent technologies in architecture and industrial design, the digital methodology relating both professions and their application in performance-orientated, mobile and ecological building systems. Following ten years of collaborative experience in academic, research and professional projects he co-founded BART//BRATKE in 2014.

Marvin's body of work concentrates on projects of various scales in Germany, Saudi Arabia, China and the Netherlands focusing on architectural and art projects as well as digital fabrication technique. His creations and ideas are greatly influenced by cultural, biological and technological environment with social aspects of 21st century context. His award winning work has been widely published in several journals and exhibited, e.g. at the IAA Frankfurt, Munich Design Week and push.conference.

Project description:

Batwing

A tangible way to approach mathematics. BatWing physically expresses the forces inside the structure to give visitors an appeal to applied geometry solutions.

The BatWing sculpture was conceived during the Math Creations Competition 2017 by BART//BRATKE in collaboration with StudioDE. The sculpture draws inspiration from various mathematical paradigms such as minimal surfaceds, discretization, isosurfaces and isocurves and surface population.

Mathematical inspiration:

Batwing is based on the mathematically defined geometrical model of a triply periodic minimal surface. By its manifold nature it questions spatial categories such as inside/outside or upside/downside.

The design of the final sculpture takes a number of steps involving tailor made scripts and advanced computational design tools. The prototypical geometrical model of the batwing surface is exposed to a surface relaxation simulation under its own weight to optimize the form. The surface is then tessellated into triangles. Using another script porosity is introduced to the triangles: the closer the triangles are to the center the lower are tension forces, hence the higher is the porosity. In the last design step an analysis determines triangles with similar local surface curvature and joins these to form continuous strips. This not only reduces lasertime and assemblytime but also brings about a highly articulated and ornamental appearance. The assembly and production process is increased via precise design decisions and file-to-factory methodologies that directly influenced the design process from the beginning to streamline the production. The 120 laser-cut unique pieces were assembled and produced with the help of FabLab Berlin.



Christian Tschersich *Batwing*



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Bio:

Christian Tschersich is a German architect and educator currently based in Berlin. He was trained as an architect in Germany and the Netherlands and graduated from KIT (Karlsruhe Institute of Technology) with honors and as best of his class.

Chris takes a leading role in both the design and delivery of challenging design projects. His diverse range of experience in varying scales, climates and regions has led to an extensive knowledge of effective sustainability and performance driven design strategies. His approach seeks to blend contextual concerns with innovative formal and material solutions to provide multi-performative design solutions which handle the complexity of diverse environments of the present and often reach out into the future as an enabler and catalyst.

In parallel to working as an architect Chris holds a position as Senior Lecturer at Karlsruhe Institute of Technology and is Key Faculty member at CIEE Global University in Berlin.

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