

FLAKE SYSTEM

Javier Martín, Juan Pablo Ugarte,
Johannes Staudt, Sofia Koutsenko

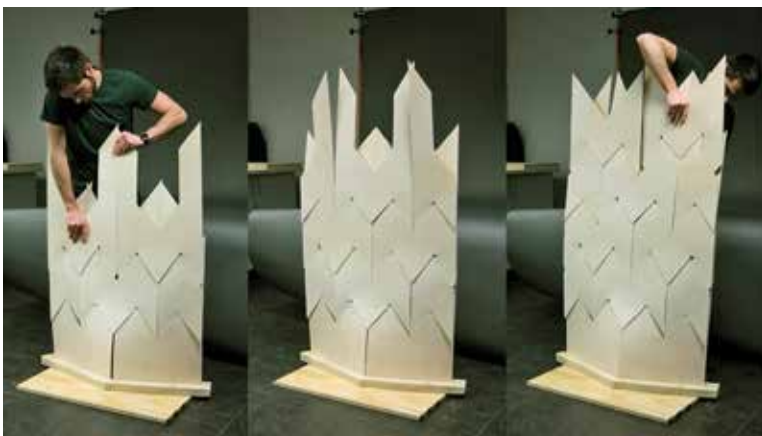
Massachusetts, Estados Unidos, 2013



Architectural production can be understood as a process in three stages –design, fabrication and assembly– which have not been equally affected by digital culture. While the stages of design and fabrication have widely adopted the use of digital tools, and computer design software have enormously expanded their capacities and applications (as digital fabrication machines have become more accessible), the stage of assembly still lacks a technological platform similar to CAD/CAM that would allow to establish a continuous work flow with its previous phases. Even more so, digital tools have facilitated the proliferation of high complexity designs, aggravating this phenomenon.

The Flake System arises from the tension between the processes of design, fabrication and assembly. Aiming to optimize the processes of assembly and disassembly, a mono-material, no-connections constructive system was developed, oriented towards the construction of double curvature surfaces. The system dismisses connectors and adhesives, using superposition and geometric interlock between the different panels as the only means of fixation, thus creating the desired surface.

To test the Flake System, a prototype was built in 3 mm thick plywood, chosen for its flexibility, orthotropic behavior and easiness to work with by CNC machines. The geometry used was a column created from a double curvature surface in revolution, similar to a hyperboloid. The decision of such geometry was based on three of its properties: (1) it's a self-standing structure, simplifying the assembly process; (2) it has radial symmetry, which later reduced the number of unique pieces in the system; and (3) it's an anticlastic surface (double curvature in two opposing directions), adding complexity to the construction of the proposed task and presenting a good structural behavior. **ARQ**



Ensamblaje y movimiento / Assembly and movement © Javier Martín



Prototipo / Prototype © Javier Martín

Arquitectos / Architects

Javier Martín, Juan Pablo Ugarte, Johannes Staudt, Sofía Koutsenko

Colaboradores / Contributors

Leire Asensio

Ubicación / Location

48 Quincy street, Cambridge, Massachusetts, USA.

Encargo / Commission

Proyecto desarrollado en el marco del seminario de investigación / Project developed under the research seminar (Re)Fabricating Tectonic Prototypes, Harvard University Graduate School of Design

Profesor guía / Tutor

Leire Asensio

Asesoría estructural / Structural advice

Hanif Kara. AKTII

Construcción / Construction

Javier Martín, Juan Pablo Ugarte, Johannes Staudt, Sofía Koutsenko

Fecha proyecto y construcción/ Date of project and construction

2013

Materiales / Materials

Estructura en terciado de 5 mm de espesor / Plywood structure, 5 mm thick

Superficie construida / Floor area

Variable

Presupuesto / Cost

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JAVIER MARTÍN

Architect, Universidad Politécnica de Valencia, 2009; Master in Design Studies, Harvard University Graduate School of Design, USA, 2014. Doctor (c) in architecture, Pontificia Universidad Católica de Chile. TA at the Universidad de Chile.

JUAN PABLO UGARTE

Architect, Pontificia Universidad Católica de Chile, 2010. Master of Architecture, Harvard University Graduate School of Design, USA, 2014. Doctor (c) Harvard University Graduate School of Design. Adjunct professor at the Boston Architectural College.

JOHANNES STAUDT

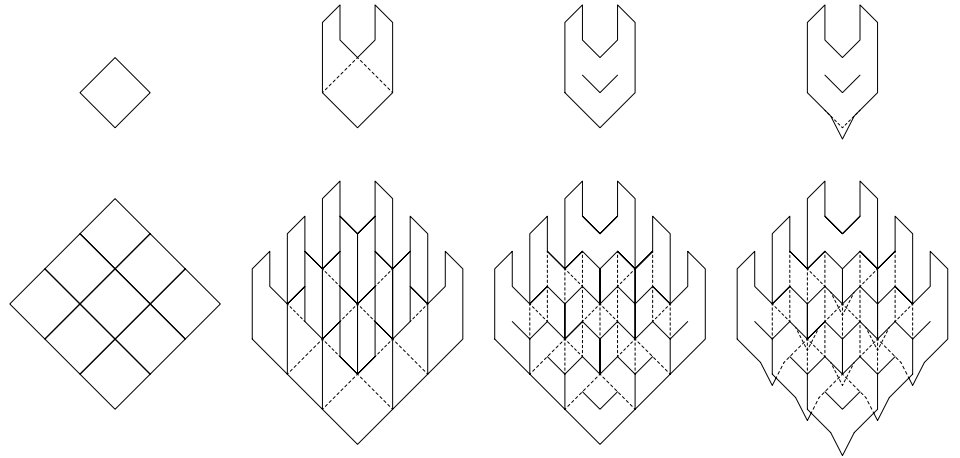
Architect, Technische Universität Berlin, Germany. Master in Design Studies, Harvard University Graduate School of Design, USA. He currently works at Thomas Phifer Architects.

SOFÍA KOUTSENKO

Architect, University of Oklahoma, USA. Master of Architecture (c) at the Harvard Graduate School of Design, USA. She has taught at the Boston Architectural College, Woodbury University and The New School of Architecture and Design of San Diego.

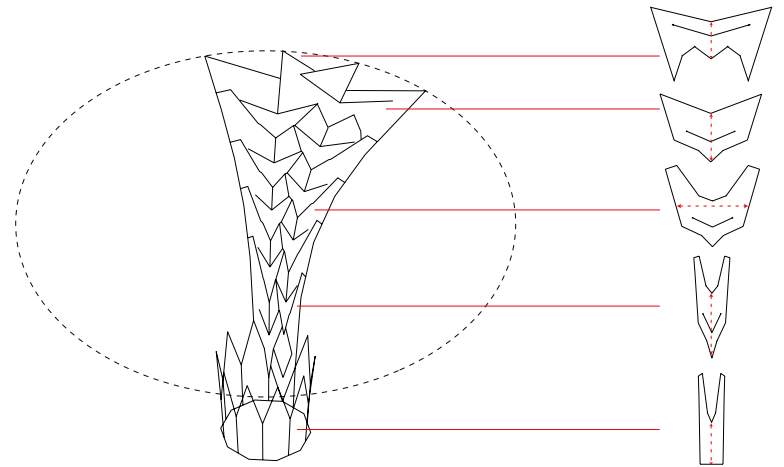
/ Cutting pattern

E. / S. 1: 50



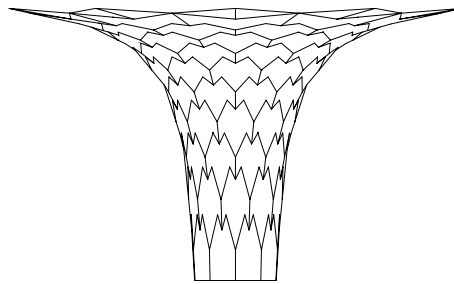
Scheme of parts and positions

S. E / N. S.



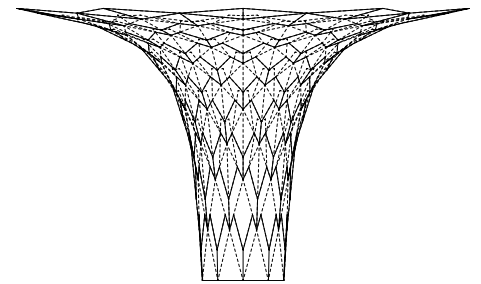
/ Front view

E. / S. 1: 50



/ Front view with assembly

E. / S. 1: 50



Assembly sequence

E. / S. 1: 50

