Cover image: Pointcloud scan of Lau Pa Sat Food Court, Singapore

Singapore Hawker Centres

Interacting Flows in Urban Systems

ARK-E3004 Design of Structures - Spring Studio
MAR-E1032 Digital Landscape Architecture and Urbanism

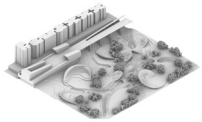
Projects submitted: 10.05.2019

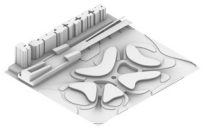
Teaching team: Toni Kotnik, Pia Fricker, Carlos Banon
Luka Piškorec, Kane Borg, Sourabh Maheshwary

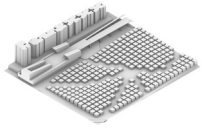
3D printing support: Manuel Fonseca

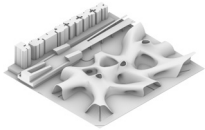
Booklet editing: Luka Piškorec, Kane Borg

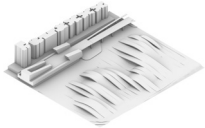
A” DS Aalto University Design of Structures
A! CM Aalto University Computational Methodologies for Landscape Architecture and Urbanism
A+SD ARCHITECTURE AND SUSTAINABLE DESIGN

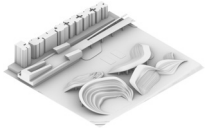












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Folds
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Design in the VOID
Amirhossein Teymourtash

Introduction

A!
Aalto University
SPRING SEMESTER 2019
ARK-E3004 Design of Structures_Spring Studio
MAR-E1032 Digital Landscape Architecture and Urbanism
Singapore
Hawker Centre
Interacting Flows in Urban Systems
Digital design is driven by thinking in structures and systems, translated in pattern of order and their interaction. The joint studio is an introduction into such design thinking and emphasizes the exploration of spatial organizational pattern, in various levels of abstraction and scale through the integration of computational methods and workflows. The studio in spring is part of a collaboration with Singapore University of Technology and Design (SUTD) and will explore the role of hawker centres as civic spaces in Singapore. Within the studio, computational methods and techniques will be developed to study the relation between the centre and the city across scales and its underlying flows of different data streams like, people, material and culture, urban green. This knowledge will be used to speculate on proposals for new types of hawker centres in Singapore aiming at the connection of urban and green systems into a new urban typology.
The studio is organized as an experimental design lab. Computational explorations are complemented by physical exploration through the integration of the robot arm, as well as theoretical grounding. Studio teaching is supported by intense skill building workshops and reading & discussion rounds. The course is aiming at the rethinking of fundamentals of contemporary architecture and landscape architecture and can serve as starting point for a thesis research.
Prerequisite: completed Bachelor studies; proficiency in Rhino (equivalent to ARK-A2504 Software Basics II); basic knowledge of Grasshopper beneficial (equivalent to ARK-E2507 Parametric Design)
Credits: 15 +5 ECTS
participants of the studio will be registered in parallel to the following courses:
ARK-E3004 Design of Structures_Spring Studio (10cr), MAR-E1032 Digital Landscape Architecture and Urbanism (5-10cr)
Number of participants: max. 10
Time: teaching period III - V, Thursdays 9h-17h (start: 10.01.2019)
Excursion to Singapore: 16.2-24.2.2019 (travel costs covered by Aalto, t.b.c), VISA requirements to be considered
Worskhops: SUTD students visiting Aalto 11.3-15.3.2019
Teaching team: Prof Toni Kotnik, Prof Pia Fricker, Luka Piskorec, Prof Carlos Banon (SUTD) and Prof Bige Tuncer (SUTD)
A" DS Aalto University Design of Structures
A! CM Aalto University Computational Methodologies for Landscape Architecture and Urbanism

Singapore Hawker Centre

Interacting Flows in Urban Systems - Spring Semester 2019

The booklet presents a selection of eight studio projects elaborated by students of Aalto University, Department of Architecture. In the context of a joint speculative design studio between the Professorship of Design of Structures and Professorship for Computational Methodologies in Landscape Architecture and Urbanism (Aalto University), and the Professorship of Architecture and Sustainable Design (Singapore University of Design and Technology) students were asked to rethink fundamentals of contemporary architecture and urbanism while working on an existing site in Singapore.

Teaching Team

Pia Fricker, Professor in Computational Methodologies in Landscape Architecture and Urbanism, Aalto University

Toni Kotnik, Professor in Design of Structures, Aalto University

Carlos Bañón, Professor in Architecture and Sustainable Design, SUTD

Luka Piškorec, Lecturer in Design of Structures, Aalto University

Kane Borg, Teaching Assistant, Aalto University

Sourabh Maheshwary, Teaching Assistant, SUTD

Manuel Fonseca, Workshop Master, Aalto University

Students

Aino Hautala, Amirhossein Teymourtash, Joonas Saarinen, Kai Hakala, Marjo Airamo, Nora Sønstlien, Petra Suittio, Saviana Theiss, Solveig Døskeland, Tina Cerpnjak, Yiping Zhang, Yuyang Shi

Left: Studio announcement poster

Biographies

Toni Kotnik is Professor of Design of Structures at Aalto University in Helsinki, Finland. He studied architecture and mathematics at Germany, Switzerland and the US. Before joining Aalto he taught among others at the Swiss Federal Institute of Technology (ETH) in Zurich, the Architectural Association (AA) in London, the Institute for Experimental Architecture at the University of Innsbruck and the Singapore University of Technology and Design (SUTD). He has been lecturing at leading universities worldwide and his practice and research work has been published and exhibited internationally, including the Venice Biennale. His research is centered on the integration of knowledge from science and engineering into architectural design thinking and the exploration of organizational principles. He is Head of the Design of Structures Group and directing the teaching and research conducted at the professorship.

Pia Fricker holds the Professorship for Computational Methodology in Landscape Architecture and Urbanism, linking between the area of large-scale landscape architecture design and urban design. In 2017 she founded and directs the Digital Landscape Architecture Laboratory, which is a teaching and research hub fostering the experimental integration of emerging computational methods and workflows. The hub is actively collaborating with other Departments at Aalto University, as well as with professional partners on a national and international level. Current research projects: Data-driven Design in the Realm of Mixed Reality, Experience Research in Spatial Immersive Data Interaction in VR , Data Simulation as Design Tool. In her teaching, Fricker encourages student's enthusiasm for computational experimentation in the design of projects that are sensitive to the qualities of a singular place as well as part of the broader context–be it urban or rural.

Left: Pointcloud scan of Makansutra Gluttons Bay, Singapore

RETURN YOUR TRAY
KEEP THE
TABLES CLEAN

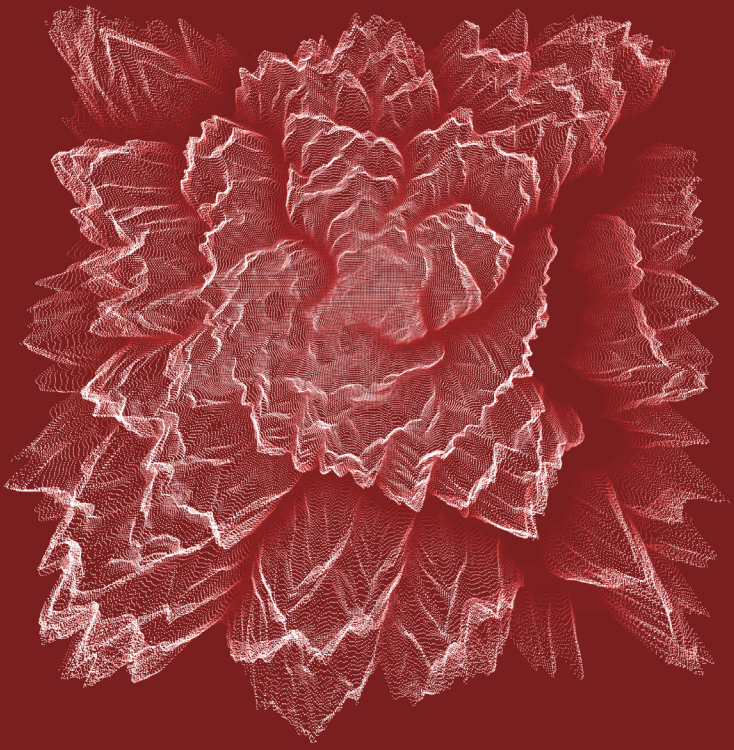
Luka Piškorec studied architecture at the University of Zagreb in Croatia and worked in architectural offices in Croatia and Switzerland. He continued his studies at the ETH Zürich and received his Master of Science in Architecture in 2011. During his studies, he concentrated on digital fabrication techniques as well as algorithmic programming procedures applied to architecture. In 2011 he started working as a research assistant at Gramazio Kohler Research at ETH Zurich. From 2011 to 2014, he was leading the Chair's elective course and elective thesis workshops dealing with the development of robotic digital fabrication techniques and their implementation in architectural design. From 2015 to 2017 he was involved in organizing and teaching at the newly formed Master of Advanced Studies (MAS) ETH in Architecture and Digital Fabrication. In 2015 he co-founded the Zurich based TEN Association, a group dedicated to initiation and promotion of cultural ventures, with which he won the Swiss Art Awards in 2018. Since 2017 he works as Lecturer in Design of Structures at Aalto University in Helsinki.

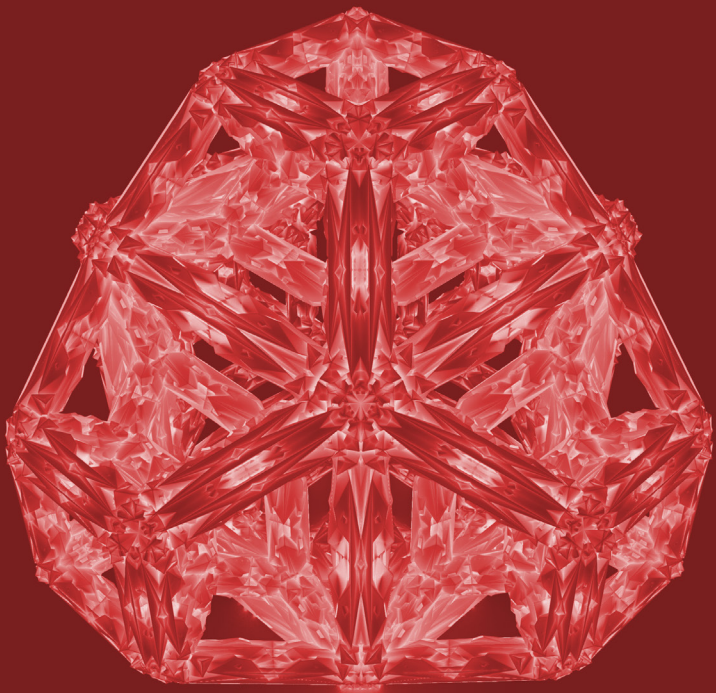
Kane Borg studied engineering and architecture at the University of Malta. He graduated with First Class Honours in 2013 and was warranted in 2014. From 2013 till 2016 he practiced as an Architect and Civil Engineer with architectural offices in Malta, working on industrial, commercial and residential buildings. During this time he cofounded and was the technical director of fablab Valletta. Since 2015 he worked as a freelance computational design consultant for varied architectural and engineering projects in both Finland and Malta. He is currently a PhD Candidate with the Civil Engineering department at Aalto, under the supervision of Prof. Toni Kotnik and Asst. Prof. Vishal Singh. Since 2018 he is a lecturer for Digital Fabrication and a teaching assistant for Design of Structures studios. His research interests include design thinking, computational design and digital manufacturing.

Left: Pointcloud scan of Newton Food Centre, Singapore

Carlos Bañón is co-founder of Subarquitectura Architects Spain, Assistant Professor of Architecture and Sustainable Design at the Singapore University of Technology and Design, and co-founder of AirLab @SUTD. He holds an M.Arch. with Extraordinary Distinction. He also held visiting professorships at MIT Massachussetts Institute of Technology and at EPFL, and was invited to lecture by a number of universities, including ETSAM Madrid, UIC Barcelona, KEA Copenhagen and PUPR Puerto Rico. His research projects span from Geometric Exploration for Space Making (GESM), 3D Printing applied to actual building components, Artificial Intelligence applied to high-rise developments, and Affordable Housing prototypes. He also implements his research and teaching methodologies in Design Studios where he applies Parametric Design, into actual buildings through his architectural practice. He was awarded with the Design of the Year Prize by the London Design Museum, received international recognition with the Golden Medal given by the International Olympic Committee, the Spanish Biennial Prize and the Mies Van der Rohe Prize nomination.

Left: Pointcloud scan of Chomp Chomp Food Centre, Singapore





Foreword

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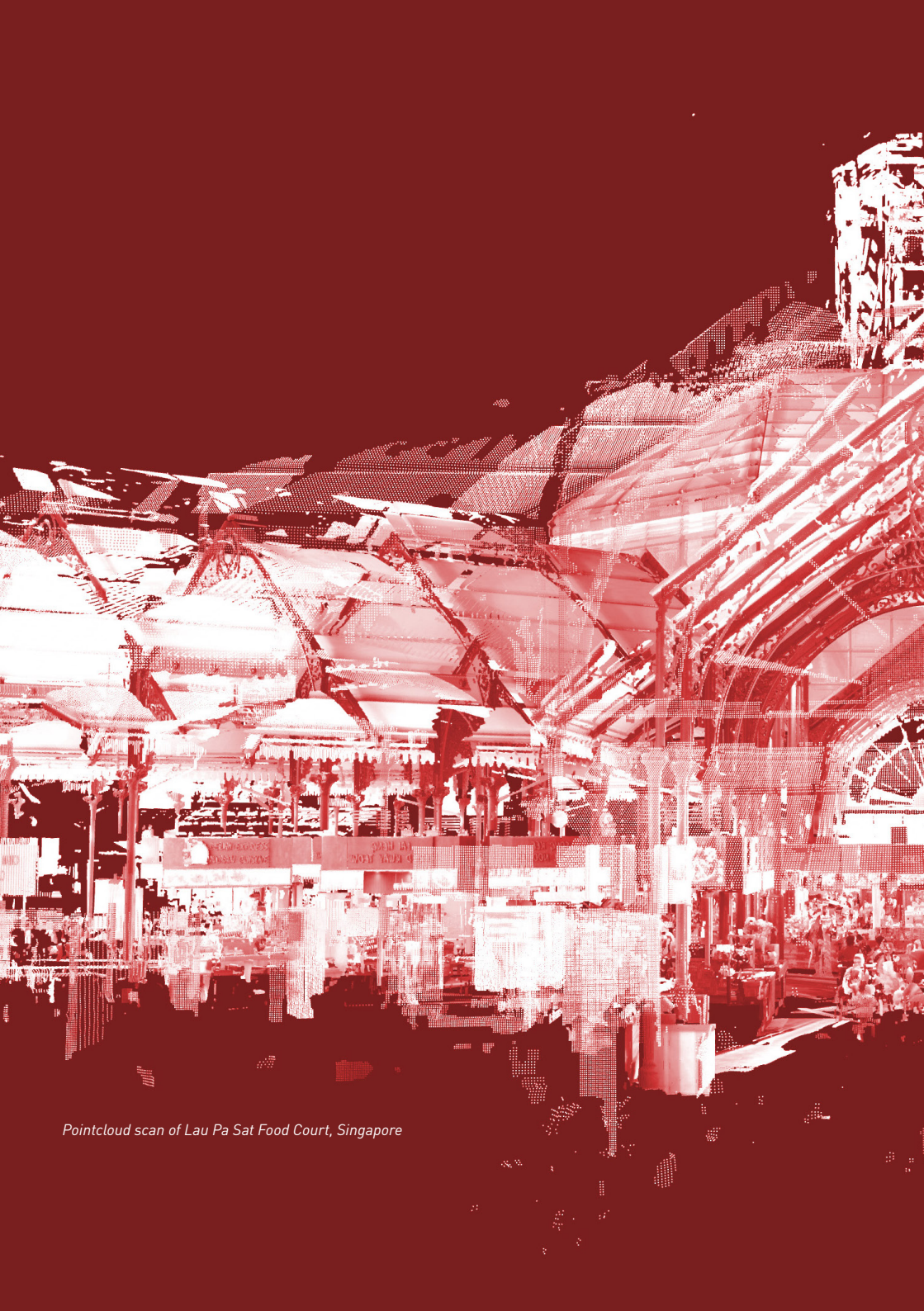
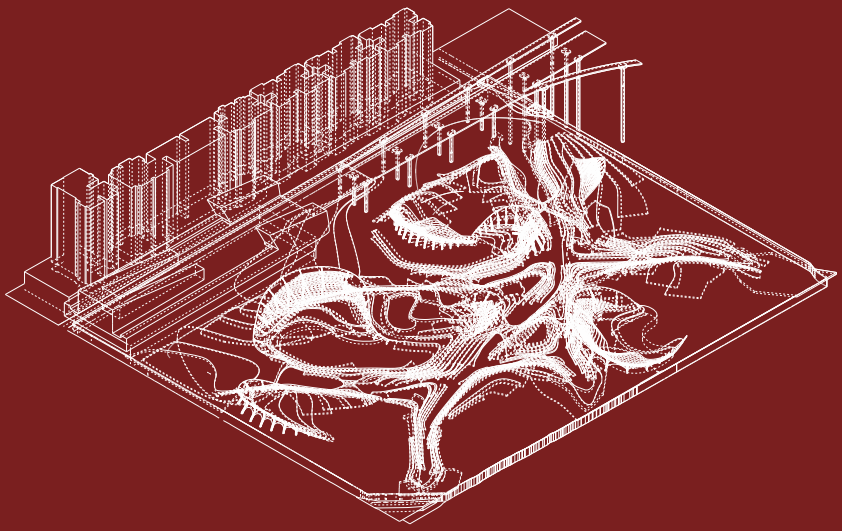
Left above: Pointcloud of a terrain extracted from a grayscale heightmap
Left below: Mesh model of an iteratively subdivided cube - 7 iterations

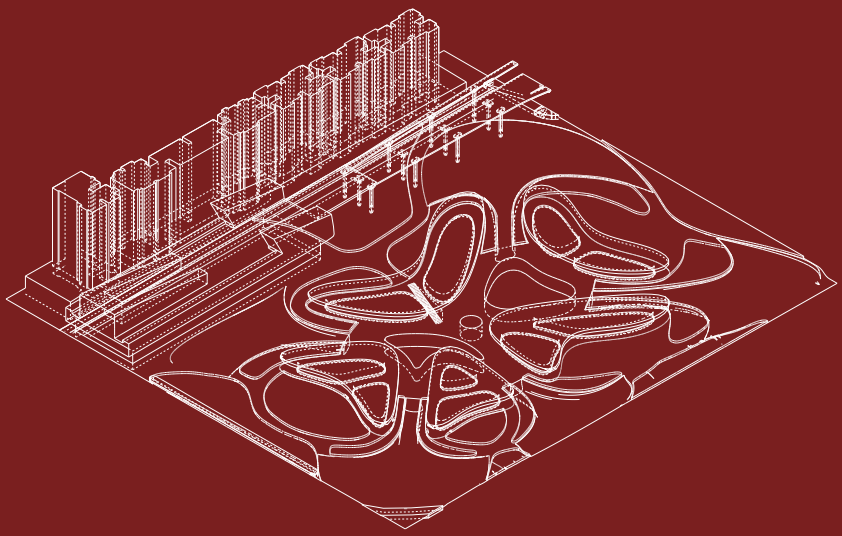


Pointcloud scan of Lau Pa Sat Food Court, Singapore

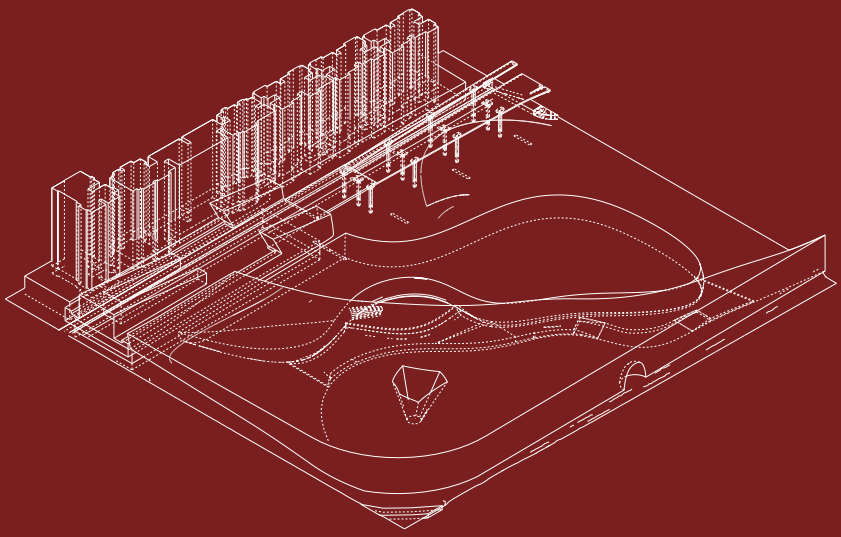
Projects



Interweave
Joonas Saarinen, Tina Cerpnjak



Connections
Kai Hakala



Urban Canyon
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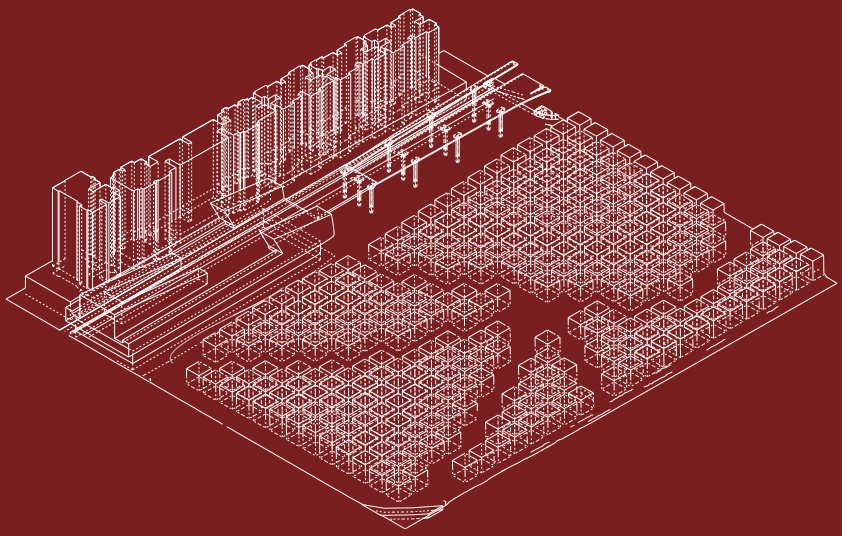

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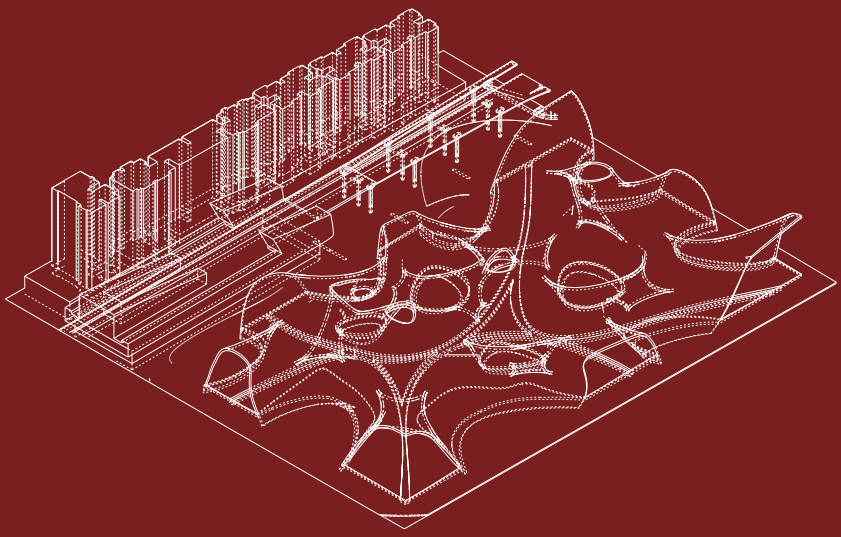

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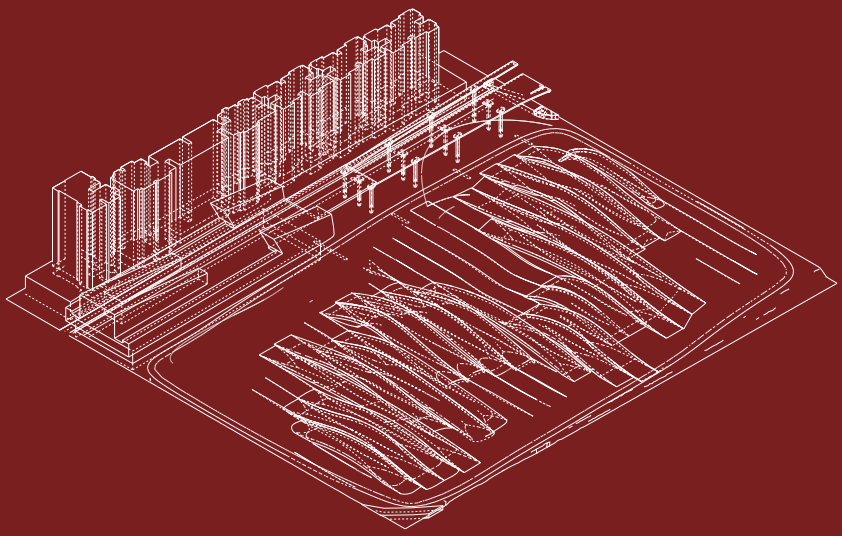

Open Form
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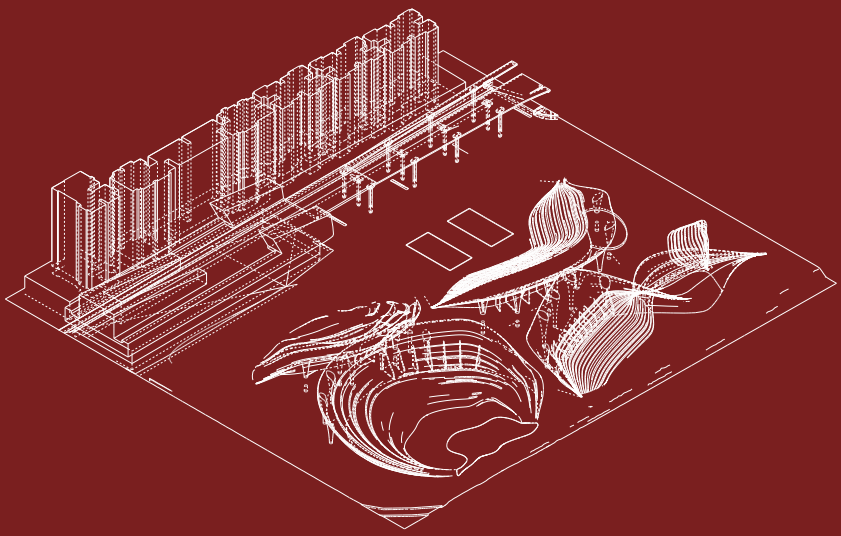
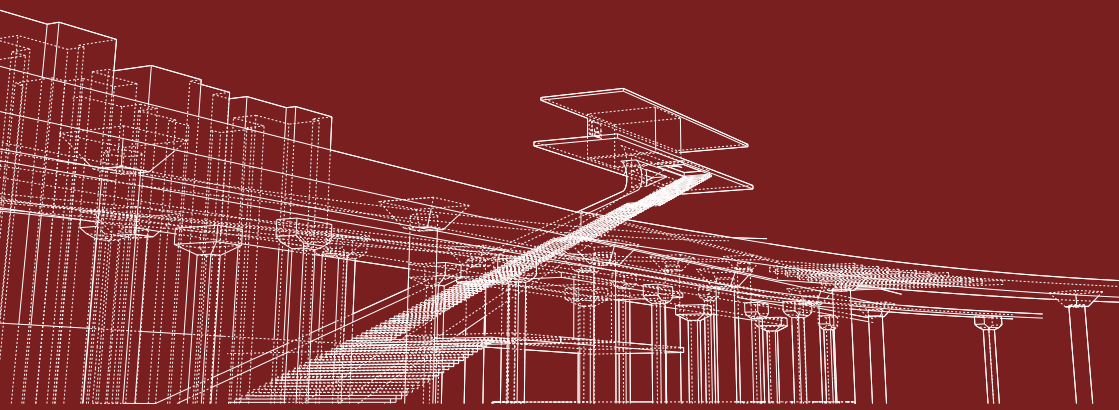


Folds
Marjo Airamo



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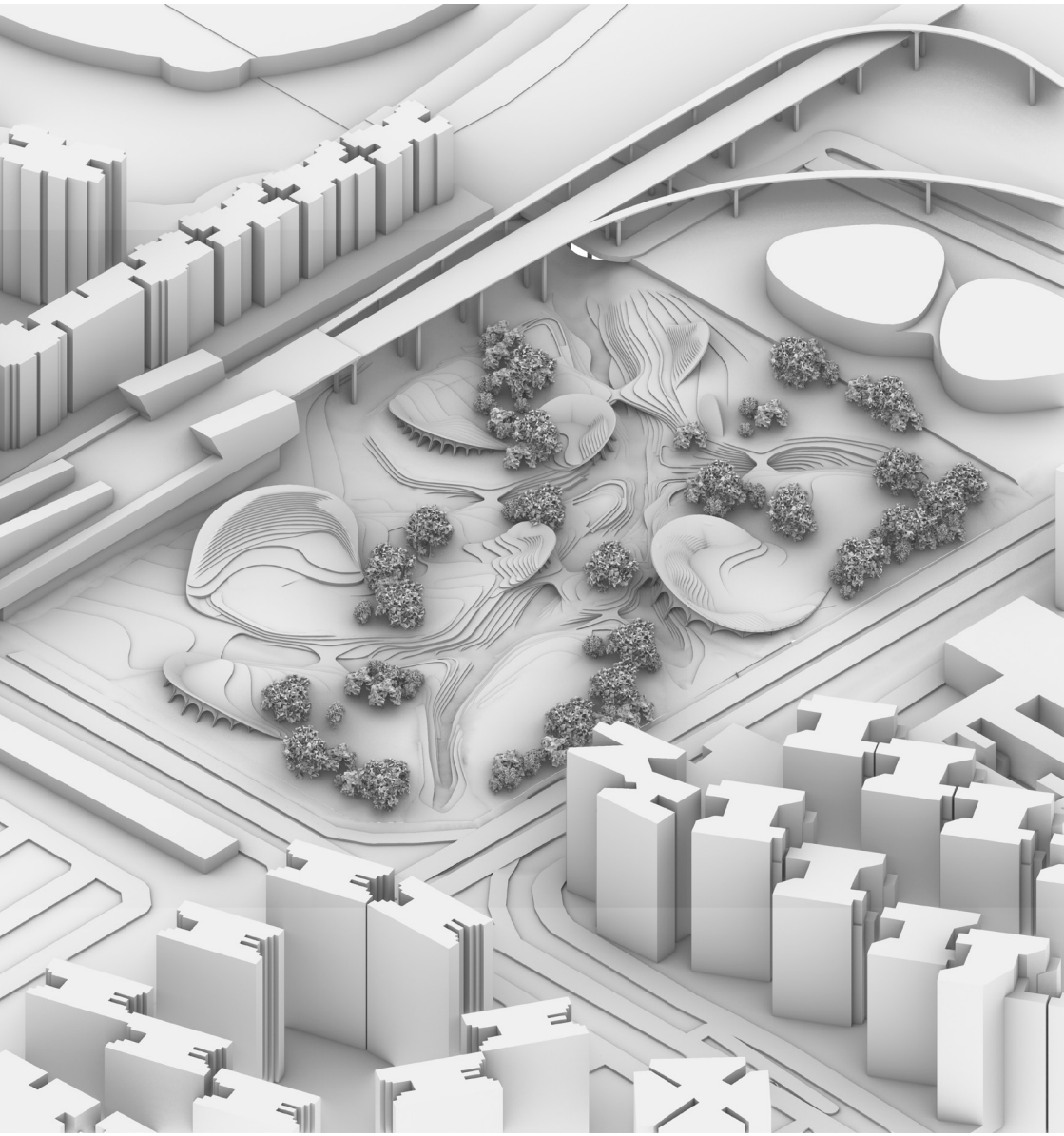

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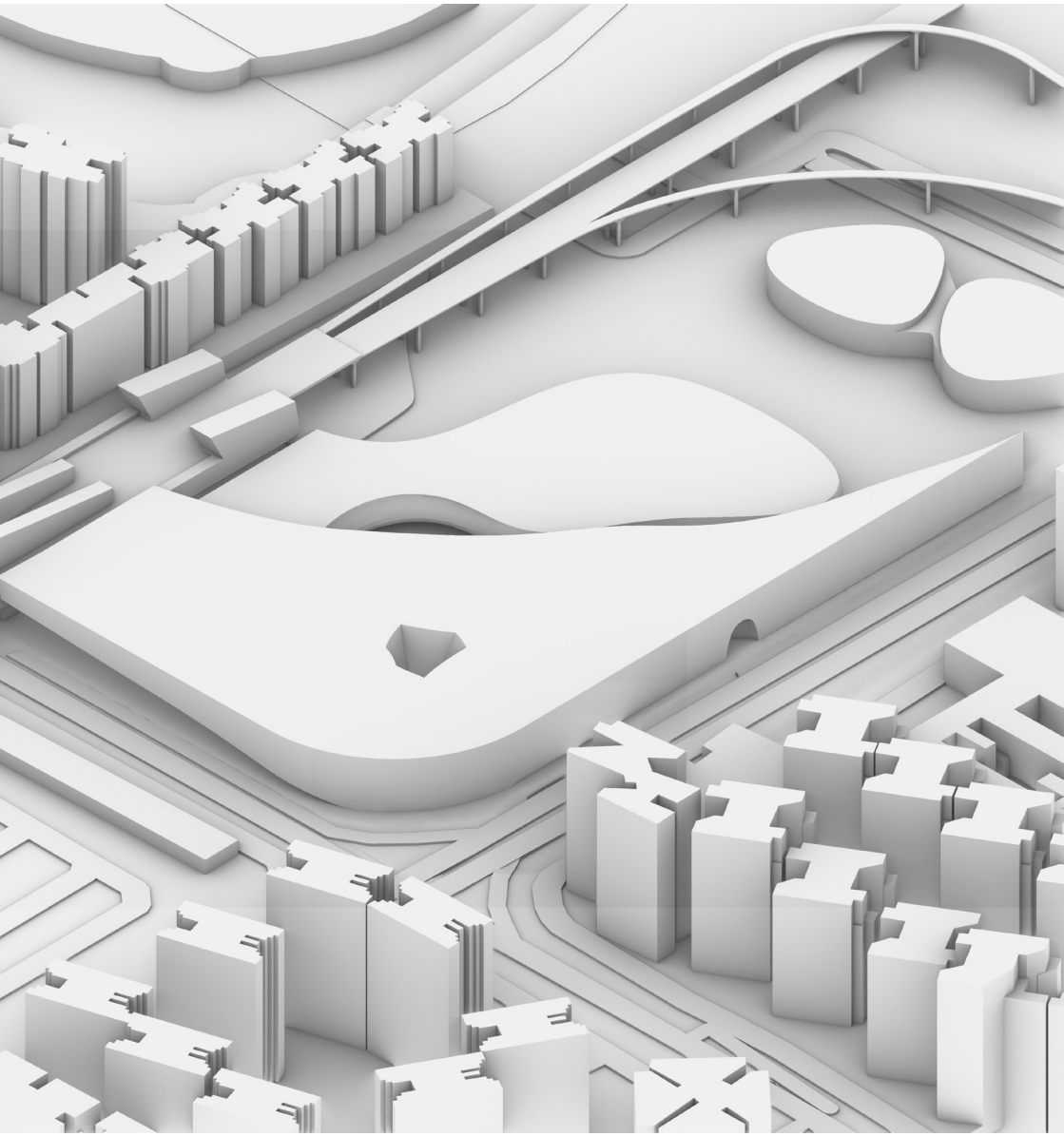

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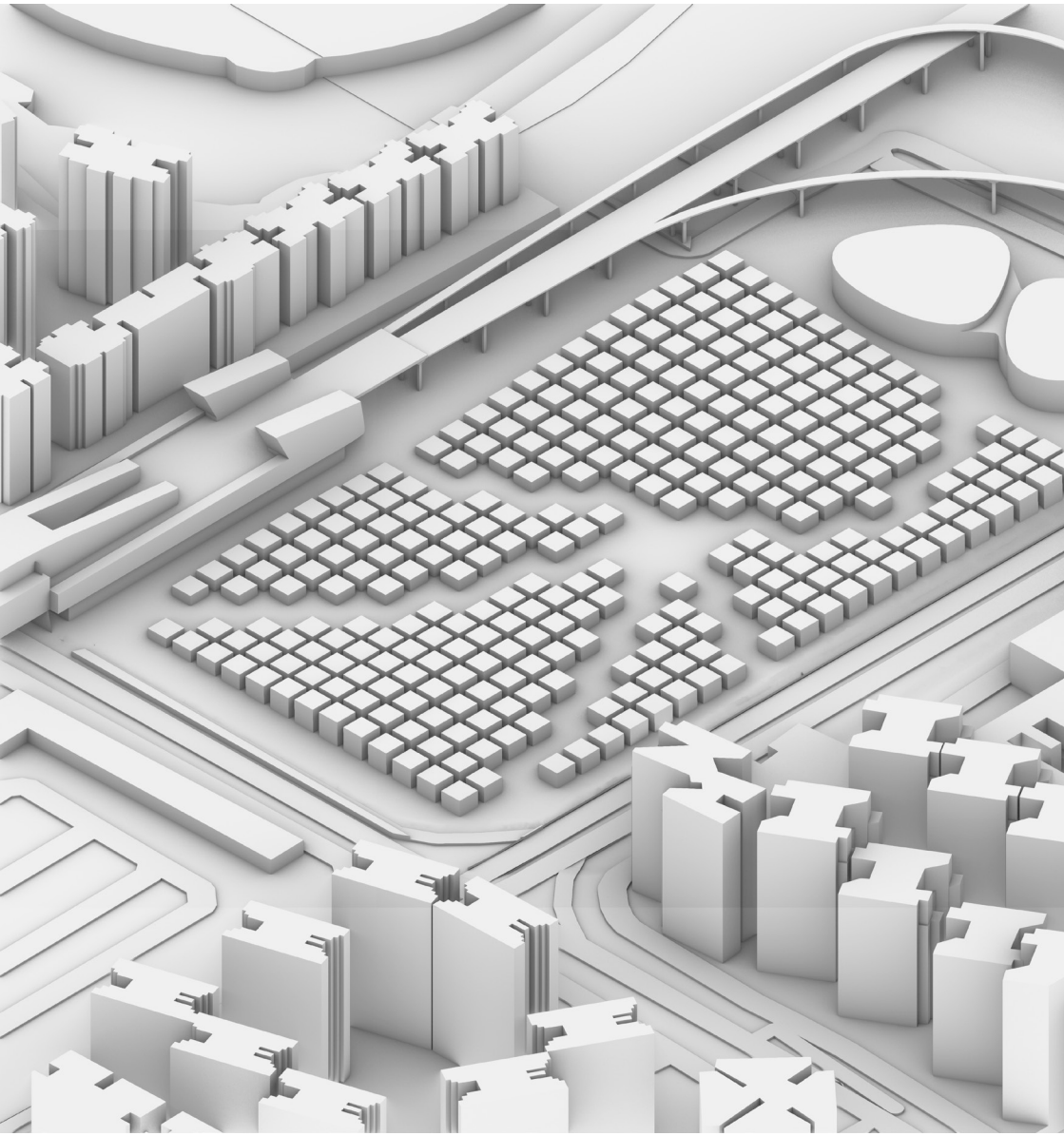

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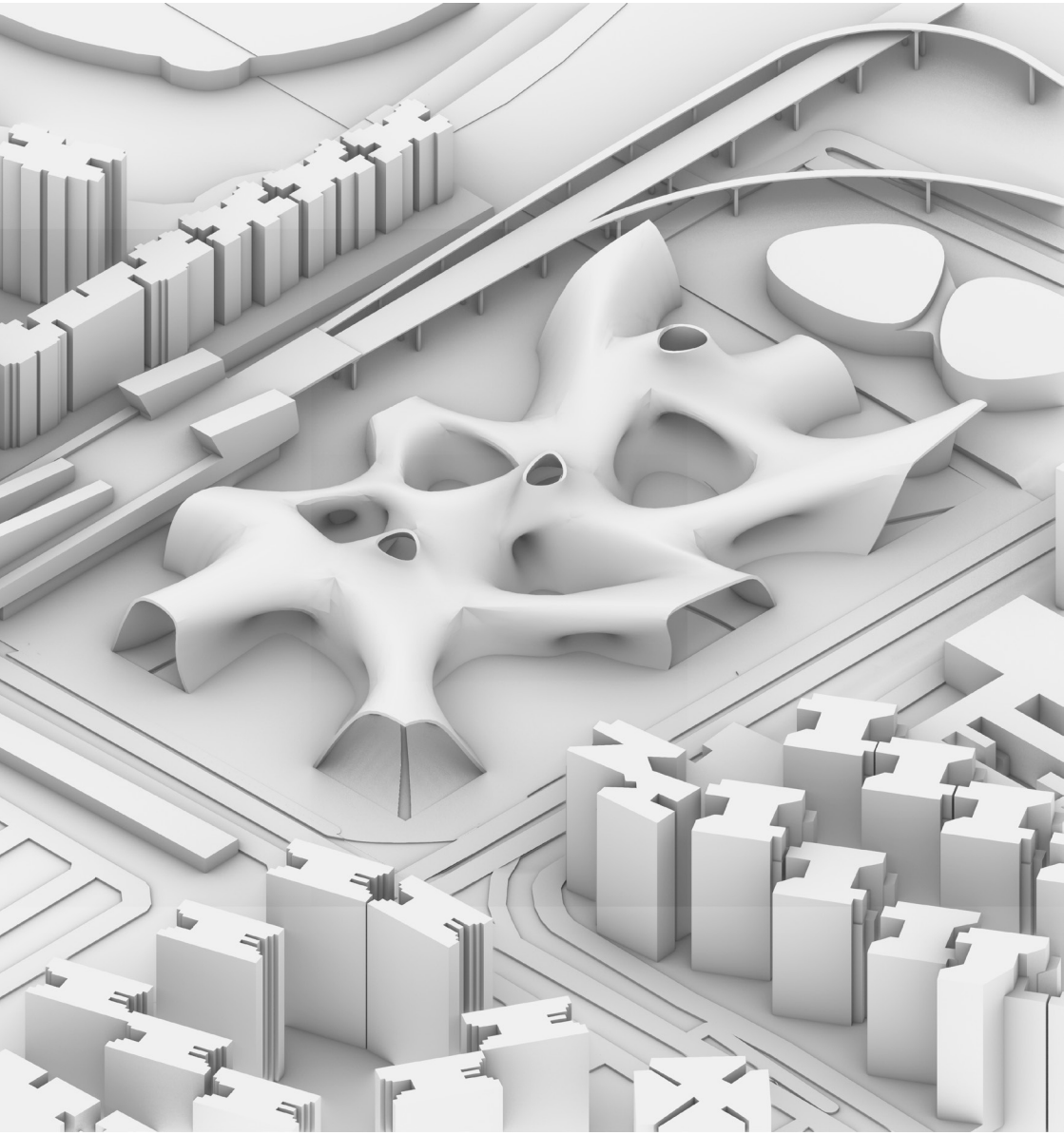

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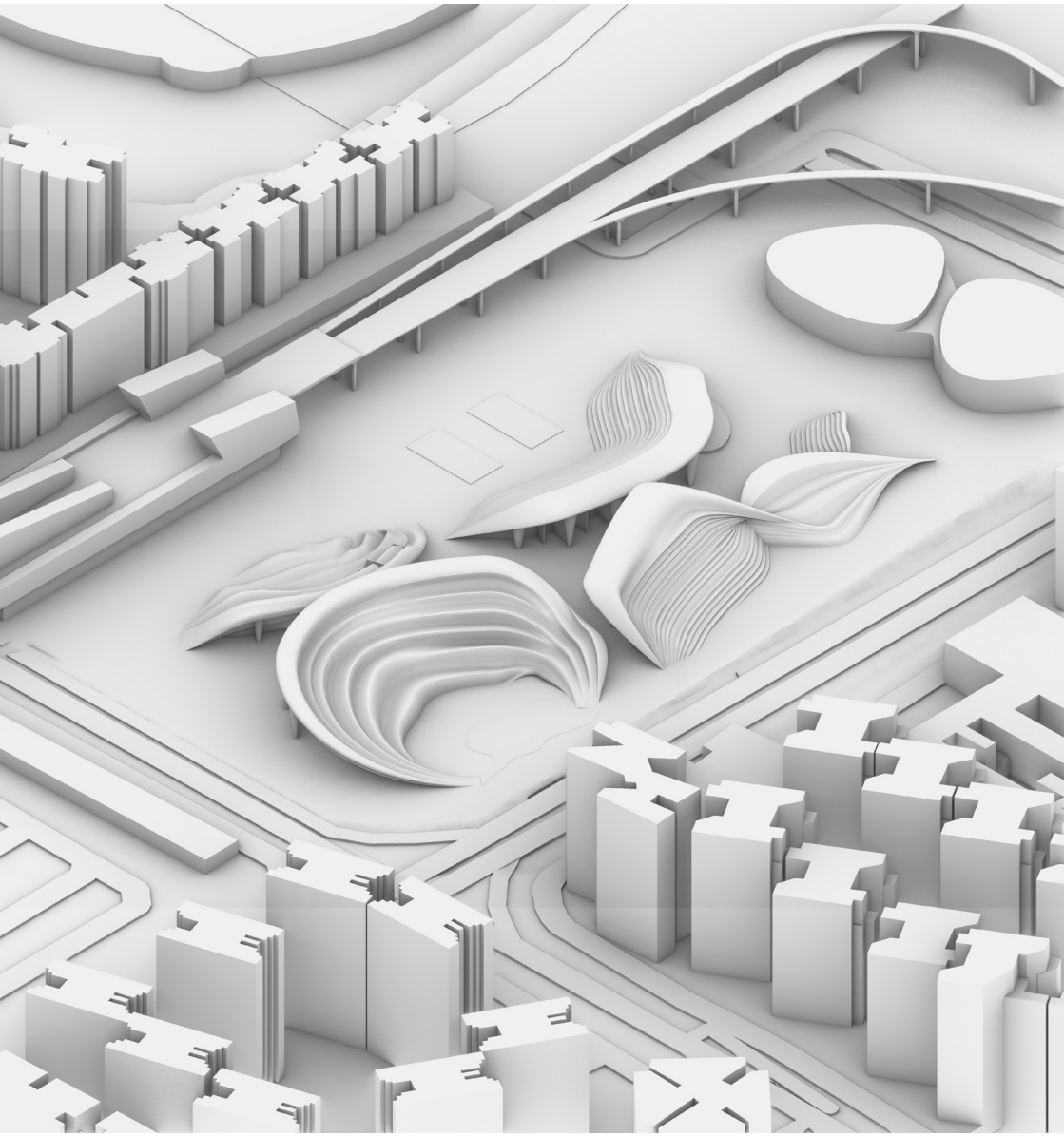

Design in the VOID
Amirhossein Teymourtash

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