Urban Mining

According to 2021 statistics, **less than 6% of plastic waste was recycled in Hong Kong.**

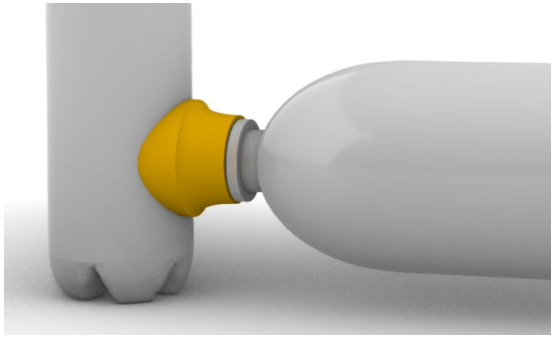
80% of plastic bottles end up in **landfills** worldwide.

As the world's population continues to grow, waste issues are becoming more critical. We are all aware of the problem—yet awareness alone is not enough.

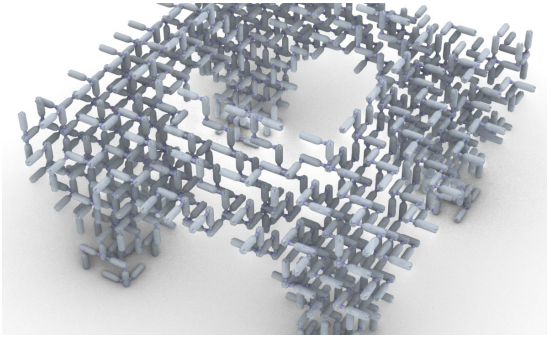
To create real change, we must **develop methods to act—together.**

Our goal is simple: **to design one small, repeatable action** that is replicable in diverse contexts, and to make this invisible problem visible by working with local residents.

SCIENCE



STEP 1: 3D-Printed Screw Joints



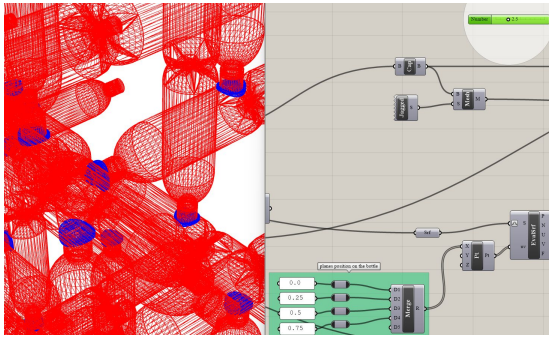
STEP 2: Parametric Aggregation System

STEP 3: Cultural Heritage

ENGAGEMENT

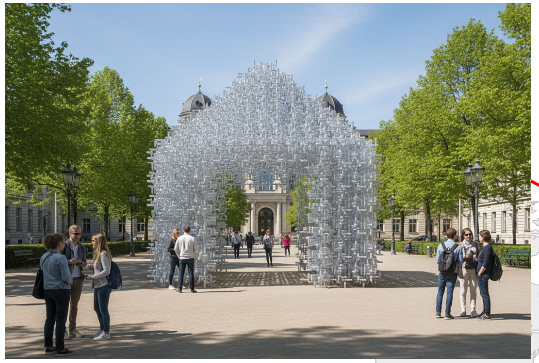
STEP 4: NGO Partners Support

STEP 5: Citizen Co-production



STEP 6: Scalable Technology Workflow

FROM WASTE TO PLACE



Urban Mining 2.0: Algorithmic Spatial Systems and Participatory Upcycling for Urban Reactivation

Bum Suk Ko, Baha Odaibat, Provides Ng

Part of a larger, ongoing effort to engage citizens in high dense neighbourhood, transforming together as an upcycling community

Credits: Provides Ng, Boyuan Yu, Jianing Luo, Patrick So

NGO Partners: HKFYG, ELCHK, BGCA, and all workshop participants

TEAM

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Architect & Computational Designer
@Neutral Lab

German Registered Architect @AKH
Certified Project Manager @IPMA
Senior Architect @Arup
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Baha Odaibat

Lead Designer / Technologist
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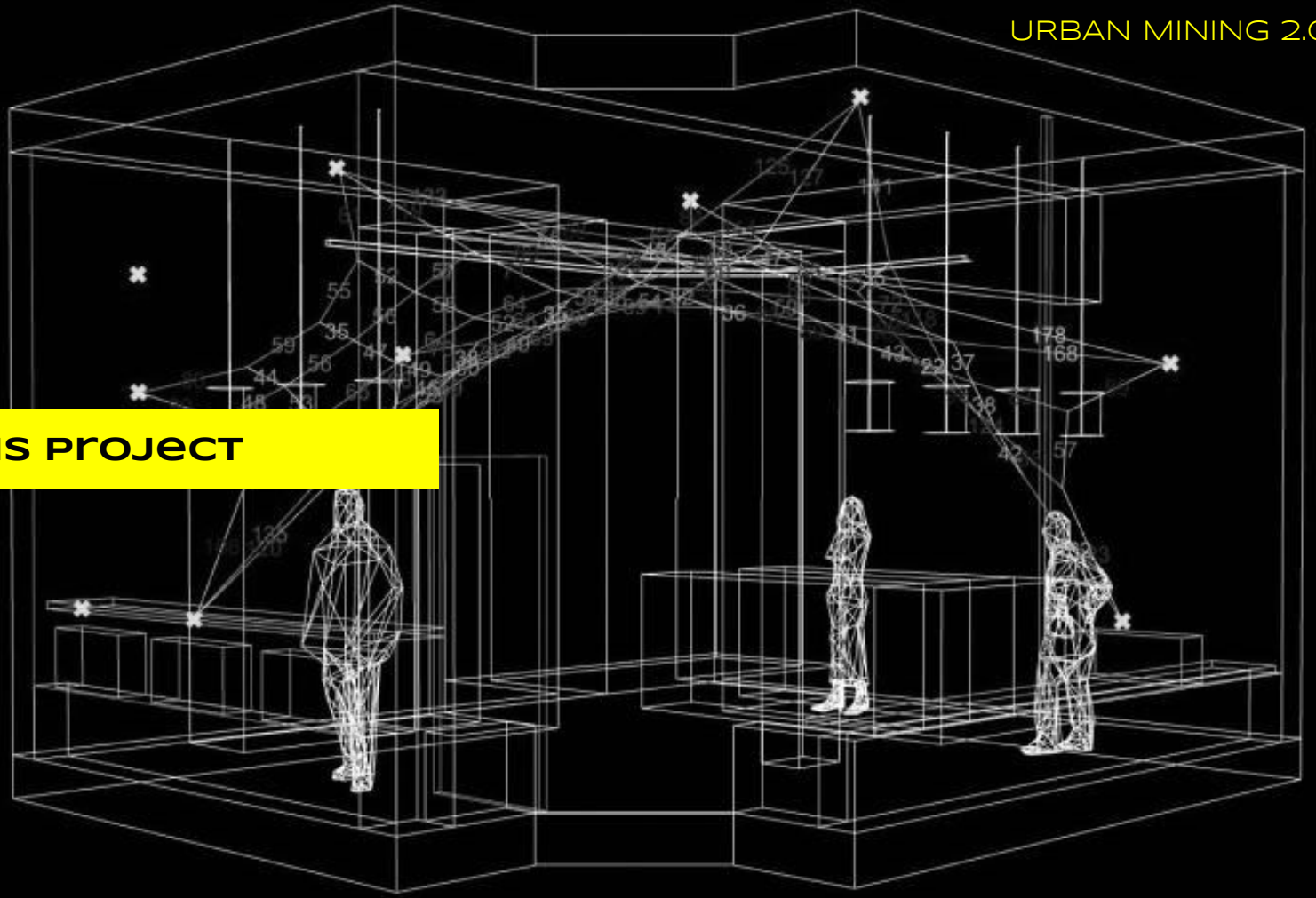
Creative director @Kaos Architects
Architect @schneider+schumacher
Head designer @Annis Eunis
BSc in Architecture @GJU

Provides Ng

Lecturer @Bartlett UCL
PhD @CUHK

Committee Member @LCSD
Panel Member @ Dev Bureau
Treasurer @CAADRIA
Associate member @HKIA



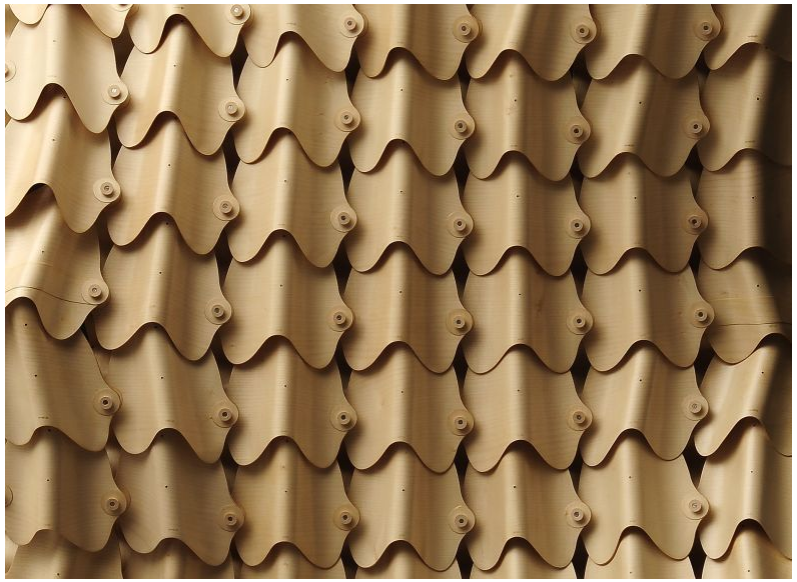
1. Previous project

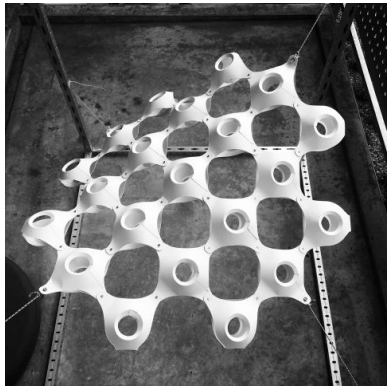
DIGITAL FABRICATION

Project:
Differentiated Morphologies

Year:
Since 2012

Investigates a component-based material system which organizes itself as a form-active lightweight tensile structure with differentiated surface articulation. The methodology stresses the calibration of manufacturing processes through exhaustive analytical testing of physical material constructions for material stiffness (elasticity).





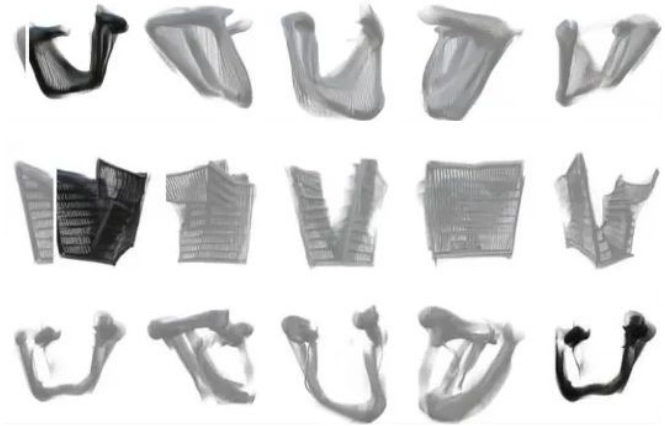
URBAN ACTIVATION

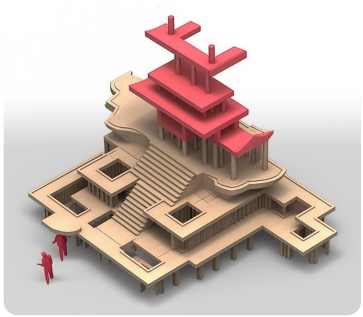
Project:
The Wave, Frankfurt,
schneider+schumacher (s+s)

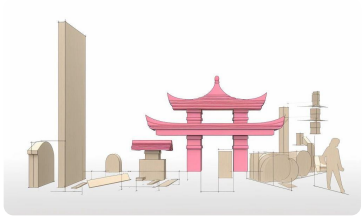
Year:
2015

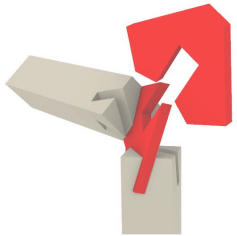
This project uses mass customization and digital fabrication to create a responsive bench system tailored to the landscape of The Wave in Frankfurt. Algorithmically generated kerf-cut patterns allow wooden elements to flex and fit the site's unique geometry. Developed as part of a site activation strategy, the benches function both as seating and sculptural elements, enhancing the area's visual and spatial identity.

CULTURAL INNOVATION









Project:
Sino-Renaissance
A cultural space design experiment

Year:
2022

Training Machine Learning Algorithms to recognise Chinese Ink Paintings and speculative design futurism architecture for Shanghai.

PARTICIPATORY UPCYCLING

Project:
e-CO Architecture
A Cooperative Fab-Lab Exploring Ecological Community Facilities

Year:
2025

Supported by Hong Kong Design Trust

We go out to local neighbourhoods to repurpose waste wood into community furniture. Resident involvement was made possible by the Digital Fabrication Method:

- CNC cutting technology
- Design for Assembly (DfMA)
- heat-shrink plastic wood joint