Workshops 26-28 April 2026

Group A (NYCU, Hsinchu)

- **A01** — Cyclops: Real-Time Urban Environmental Simulation with Foster + Partners
- **A02** — Augmenting Hyperadobe: AR-guided Earthen Construction
- **A03** — Deep Interiors
- **A04** — Sequenced Robotic Toolpaths: 3D Scanning and Bio-Printing on Organic Topology
- **A05** — Exploring Plausible Futures in Computational Design: A Human-Led, AI-Supported Scenario Workshop
- **A06** — Human–Machine Collaborative Assembly Using Relative Robotic System

Group B (ROSO, FCU, Taichung)

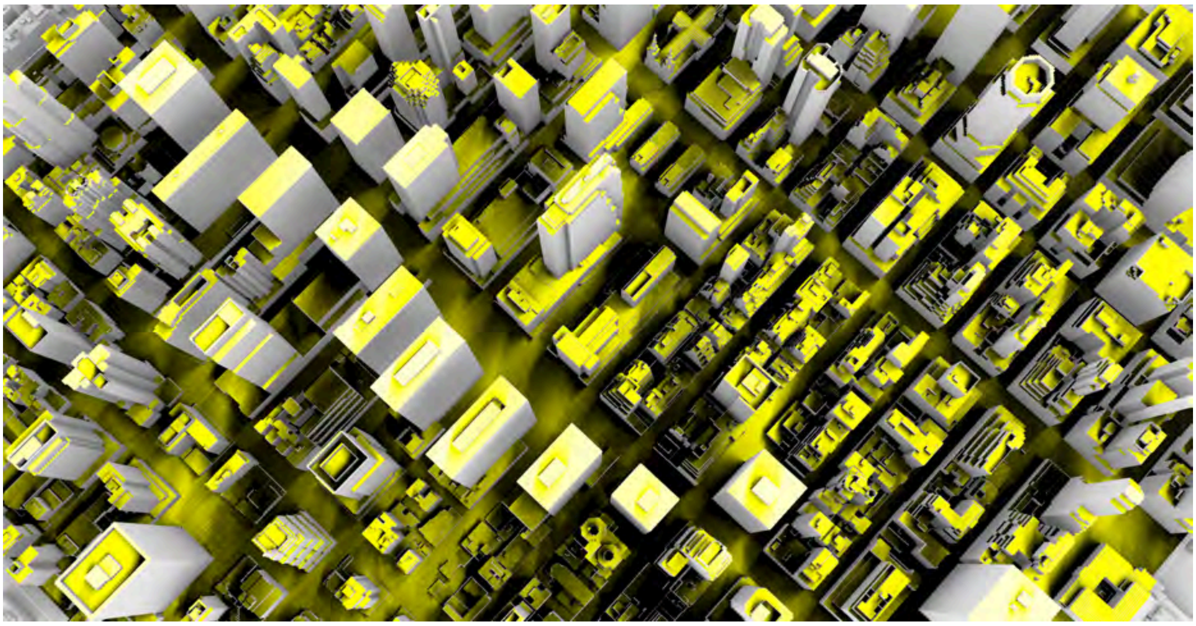
- **B01** — Co-Authoring Timber: Humans, Algorithms, and Robots
- **B02** — Embodied Intelligence: Designing UX/UI Workflows for Robotics
- **B03** — Spatial Interfaces for Real-Time Human–Robot Collaboration

Group C (YunTech, Yunlin)

- **C01** — Lamina: An Integrated Design-to-Fabrication Framework for Concrete 3D Printing in Architecture
- **C02** — Resonant Divine Realm: Emotion-Driven Taiwanese Wangye Temple Design Workshop

A01

Cyclops: Real-Time Urban Environmental Simulation with Foster + Partners



Description

Learn GPU-accelerated techniques for near–real-time analysis of solar obstruction, daylight autonomy, and cumulative radiation at façade, building, and urban-district scales with Cyclops, a free Grasshopper plugin developed by Foster + Partners.

Advancements in GPU-accelerated ray tracing have transformed our ability to conduct city-scale environmental analyses in near real time. This hands-on workshop presents reproducible workflows for GPU-based evaluation of solar obstruction, daylight autonomy, and cumulative radiation at three hierarchical levels of the built environment—façades, individual buildings, and urban districts. The workshop is structured into two modules: (1) Foundations of Environmental Analysis, illustrated with industry case studies; and (2) Analysis Methodologies for near real-time, Performance-Driven Design. By the end of the workshop, attendees will be equipped with scalable workflows for rapid environmental assessment, ready to integrate into architectural, urban, or research projects.

Duration	1 day	**Date**	Tue, 28 April
Type	Technical	**Capacity**	10-20 participants
Location	Guangfu Campus, NYCU, Hsinchu		
Requirements	Rhino 8 and Grasshopper installed, Cyclops (available free via the Rhino Package Manager), a laptop equipped with an NVIDIA GPU, power supply		

Instructor Profile

Wojciech Karnowka

Wojciech has more than 5 years of experience developing tools and pipelines to address complex issues in architectural projects around the world. Since joining Foster + Partners in 2023, he has been developing bespoke performance-driven design products and contributing to some of the iconic projects the practice is currently undertaking. As part of the Applied Research + Development team, Wojciech creates computational solutions in complex geometry, digital workflows, and performance-driven design. His expertise ranges from early-stage evaluations to implementing advanced workflow automation at scale.

Wojciech holds a degree in Architecture from The Bartlett School of Architecture at University College London. His work is driven by experimental methodologies and a commitment to developing strategies for evaluation, representation, and generation in the AEC industry.

Logistics & Scheduling

- **Schedule:**

  The proposed workshop duration is up to 4 hours, including:

  - 1h introduction to Cyclops
  - 2–3h key examples (Sunlight Hours, Sunlight Obstruction, Daylight, Radiation, multi-scale workflows)
  - 30 min. Q&A (if needed less/more)

- **Target Audience:**

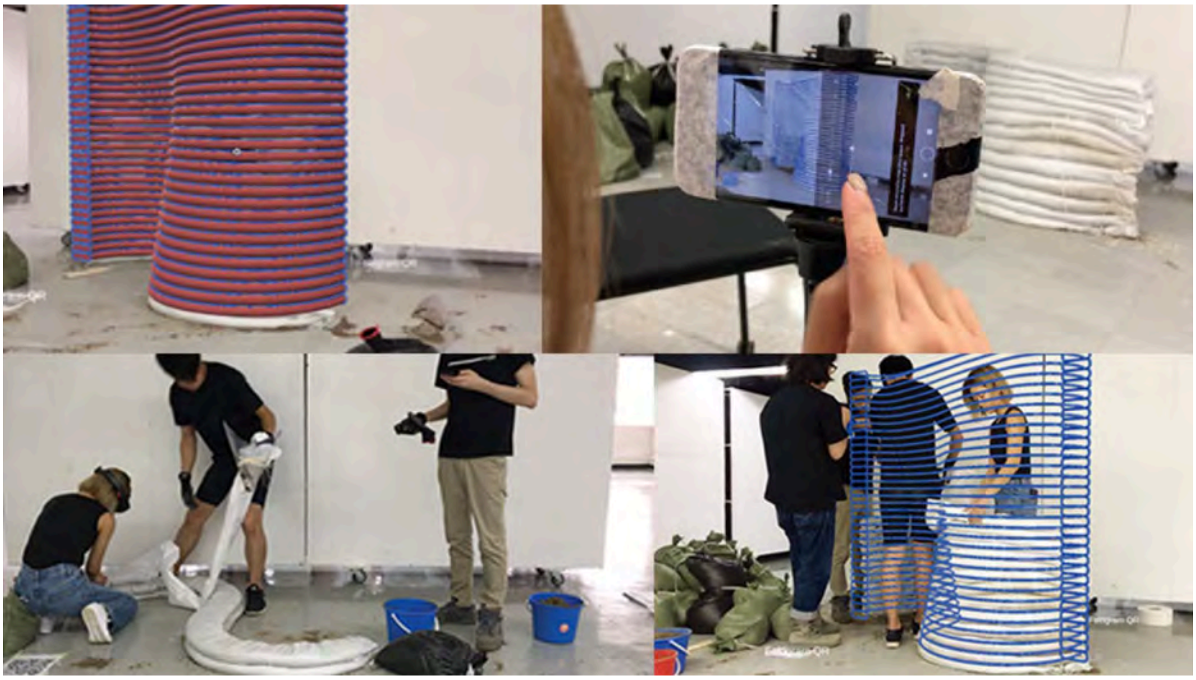
To be announced.

- **Expected Outcomes:**

  The workshop outcome will be a collaboratively built parametric earthbag structure, AR-guided construction documentation, and datasets for future research on human-machine-material interaction.

A02

Augmenting Hyperadobe: AR-guided Earthen Construction



Description

Earthen construction, exemplified by SuperAdobe techniques, offers a sustainable building method, yet complex geometries remain difficult to execute with manual craftsmanship alone. This workshop explores how path-optimization strategies from digital fabrication can inform collaborative earthbag construction. Participants will design and build a small-scale parametric earthbag structure (≈ 2*1.5*1.2 m) using AR-guided spatial feedback.

This hands-on workshop explores how these logics can be translated into human-guided earthen construction. Participants will collaboratively design variations of a parametric earthbag structure, inspired by 3D-printing path optimization strategies. Using AR headsets, builders will receive real-time spatial guidance to align earthbag placement with the digital model, allowing immediate correction during construction.

The workshop follows a four-stage cyber-physical workflow integrating parametric design, manual construction, AR-guided calibration, and point-cloud-based evaluation. In this workshop, participants will learn to:

- translate 3D-printing path optimization into layer-wise real-scale construction logic
- use AR to guide manual earthen building
- evaluate geometric accuracy in collaborative construction
- reflect on computation as a human-centered design partner in the interdisciplinary collaboration

Rather than replacing human builders, computation is treated as a humanistic collaborator that augments craft knowledge and collective decision-making. Participants will reflect on how immersive technologies reshape labor, authorship, and sustainability in low-tech construction systems.

PS: The earthen structure will be ≤1.5 m height using light soil mix, ensuring safe outdoor construction.

Duration	3 day(s)	**Date**	Sun, 26 April~Tue, 28 April
Type	Technical	**Capacity**	6-20 participants
Location	Guangfu Campus, NYCU, Hsinchu		
Requirements	Participants Bring-Your-Own-Device: • A smartphone. • Laptop with Rhino 8 installed (with Kangaroo, Ovenbird 2, and Karamba3D).		

Instructor(s) Profile

Cissy Chenxiao Li

Cissy is a PhD candidate in the Department of Architecture at HKU. With an interdisciplinary educational background including a B.Eng in Architecture and an MSD in Robotics and Autonomous Systems program, her research interests lie in the convergence of computational design, robotics fabrication, and ecology within urban environments. Her doctoral project focuses on advanced cyber-physical robotic fabrication based on natural earth-based materials to support sustainable development in high-density cities.

Kristof Crolla

Kristof Crolla is an architect who combines his architectural practice “Laboratory for Explorative Architecture & Design Ltd.” (LEAD) with his position as Associate Head (Technology Transfer) and tenured Associate Professor at the University of Hong Kong (HKU) Faculty of Architecture. He founded and directs the Building Simplexity Laboratory (BSL) research group, directs the Bachelor of Arts & Science Design+ programme and teaches at the Masters of Architecture. He graduated Magna Cum Laude as Civil Architectural Engineer from Ghent University in 2003, completed the Architectural Association School of Architecture, London (AA)'s Master of Architecture programme Design Research Laboratory (DRL) in 2007 and worked for several years as Lead Architect for Zaha Hadid Architects, for whom he a.o. lead the design of the Antwerp Port House, while teaching in parallel at the AA and other institutions worldwide. He received numerous design awards and accolades for his work focussing on the strategic integration of latest technologies in the architectural design and implementation process and is best known for the projects “YEZO”, “Golden Moon”, and “ZCB Bamboo Pavilion” for which he a.o. received the World Architecture Festival Small Project of the Year 2016 award. In 2018, he completed his PhD studies at RMIT, Melbourne, with the doctoral dissertation “Building Simplexity – The ‘More or Less’ of Post-Digital Architecture Practice” for which received the 2016 RMIT Vice-Chancellor's Prize for Research Impact – Higher Degree by Research. In 2019, he was appointed by the International Network for Bamboo and Rattan (INBAR) as a Task Force Expert Member – Bamboo Construction.

Garvin Goepel

Dr Garvin Goepel specializes in the fields of Augmented Reality (AR) and Artificial Intelligence (AI), focusing on the investigation of collaborative interactions between humans and machines. He combines his practice “Augmented Architecture Ltd.” with his position as Lecturer at the University of Hong Kong (HKU) and Co-Director of the Building Simplexity Lab (BSL). His build design and research work includes the award-winning mixed-reality artwork “Resonance-In-Sight” for HKMoA as a co-artist and the AR consultancy for multiple projects such as the World Architecture Festival (WAF 2024) award-winning bamboo pavilion MemutAR and the Bamboo U Dome in Bali. He was part of the organizing committee for the CAADRIA Conference 2021 and was a co-chair of the CAAD Future Conference 2025.

Logistics & Scheduling

- **Schedule:**

  DAY 1:

  - 9:00 - 12:00: Introduction
    - Introduction to the whole cyber-physical workflow, including the AR in exploratory manual fabrication.
  - 13:00 - 18:00: Construction
    - Base setup for the designed structure.
    - Participants assemble the designed shapes into a small-scale earthbag structure prototype.

  DAY 2:

  - 9:00 - 12:00: Construction
    - Participants assemble the designed shapes into a small-scale earthbag structure prototype.
  - 13:00 - 18:00: Construction
    - Participants assemble the designed shapes into a small-scale earthbag structure prototype.

  DAY 3:

  - 9:00 - 12:00: Construction
    - Participants assemble the designed shapes into a small-scale earthbag structure prototype and stiffen the structure.
  - 13:00 - 18:00: Reflection + Exhibition Prep
    - Participants document the process and present their outcomes and findings.

- **Target Audience:**

  Target audience:
  - Architecture students
  - Computational designers
  - Digital fabrication researchers

  Prerequisites:
  - Basic Rhino/Grasshopper knowledge
  - No AR or fabrication experience required

- **Expected Outcomes:**

  To be announced.

A03
Deep Interiors

Description

Recent advancements in generative AI and computer vision facilitate novel techniques for the analysis and transformation of interior spaces. While we usually perceive interior spaces through perspective and depth, they can also be understood as organised datasets consisting of surfaces, objects, and integrated functions. By amalgamating image processing, semantic reasoning, and 3D reconstruction into a cohesive workflow, interior spaces can transform into editable and knowledge-based systems.

This workshop takes Taiwanese cities as its context—where vernacular building typologies, such as the Taiwanese shophouse / street house (街屋), continue to shape the rhythm of daily life through their characteristic vertical stacking of ground-floor commercial use and upper-floor domestic life. As data infrastructure and edge computing become increasingly woven into the city's everyday operations, the retrofit of these familiar urban interiors becomes both a practical and speculative design question.

This workshop introduces a computational pipeline beginning with interior imagery. Participants will correct and unroll perspective views—transforming walls, floors, and ceilings into a continuous spatial atlas using image processing and geometric mapping techniques. The flattened image will then be segmented through an agent-based system, leveraging computer vision models combined with GPT-assisted semantic reasoning. This process enables the extraction of spatial components and the assignment and reimagination of functional and programmatic attributes to them (e.g., structural core, circulation, display, threshold, service).

The reimagined interior programming will guide an AI-driven inpainting techniques to envision alternative spatial configurations within the same spatial confines, speculating on how existing urban interiors might be hybridised to accommodate emerging technological, environmental, and programmatic futures. The altered space will subsequently be reconstructed in three dimensions via point cloud generation. Participants will utilise segmentation-based 3D workflows to create spatial inserts or objects that correspond with the hybridised programme, such as a neighbourhood cafe with an integrated micro data centre, a community archive and local server room, or a maker space doubling as an edge computing node.

The workshop will integrate demonstrations, structured tutorials, and practical development sessions. Participants will acquire a replicable workflow that integrates image flattening, semantic reasoning, generative editing, and spatial reconstruction. The emphasis will be on incorporating accessible AI tools into a cohesive design methodology relevant to adaptive reuse, interior retrofitting, and hybrid urban infrastructures, without an extensive examination of advanced model training.

Duration	3 days	**Date**	Sun, 26 April~Tue, 28 April
Type	Technical	**Capacity**	10-20 participants
Location	Guangfu Campus, NYCU, Hsinchu		
Requirements	Each participant should have their own Windows or macOS machine. Participants should have Rhino 8, Visual Studio Code, and Python 3.10+ installed on their machines. A modern web browser (Chrome recommended) for API testing and documentation.		

Instructor Profile

Frederick Chando Kim

Dr. Frederick Chando Kim is an assistant professor in computational design at the Department of Architecture of the National University of Singapore (NUS). His research focuses on the generative and analytical possibilities of machine learning in architectural form. He received his PhD from the Media x Design Lab at EPFL. Frederick holds a Master of Architecture from Harvard GSD and a Bachelor of

Science in Art and Design from MIT. He is a co-director of the Creative Data Critical Design (CDCD), exploring data-centric approaches to architectural and urban design.

Mikhael Johanes

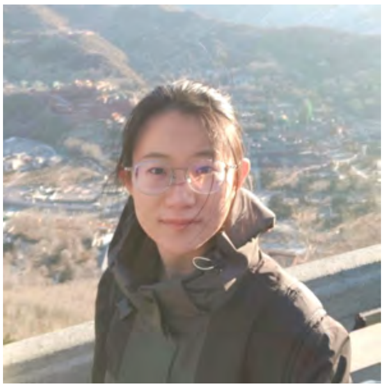
Dr. Mikhael Johanes is a Design++ Postdoctoral Fellow at ETH Zürich, working on applied AI for circular design with Prof. Catherine De Wolf and Prof. Siyu Tang. His research sits at the intersection of architectural design and machine learning, focusing on generative and analytical methods for understanding architectural space. He earned his PhD from the Media x Design Lab at EPFL and co-directing Creative Data Critical Design (CDCD). His work aims to enable machine learning models that operate on rich architectural representations, supporting AI-driven design for more sustainable built environments.

Zebin Chen

Zebin Chen is currently a PhD student at the National University of Singapore (NUS). His research focuses on computational architecture and urban generation, with an emphasis on developing computer- and AI-assisted generative design tools. He has experience assisting in design studios and conducting workshops across Singapore, Japan, and Germany.

Sim Yee Shuang

Yee Shuang is a research assistant at the National University of Singapore (NUS), where she completed her Bachelor (B.Arch) and Master of Architecture (M.Arch). Her research lies at the intersection of computational design and extended reality (XR). She explores how spatial computing, immersive interfaces, and emerging AI workflow can support civic engagement, heritage interpretation, and hybrid learning within built environments, particularly in vernacular and cultural heritage contexts.



Tian Zihui

Tian Zihui is a research assistant and MPhil student at the National University of Singapore (NUS). Her research explores how artificial intelligence can transform the interpretation and conservation of built heritage. By integrating computational design, critical heritage studies, and social history, she develops frameworks for understanding the co-evolution of architectural forms within their socio-ecological contexts.

Logistics & Scheduling

- **Schedule:**

  Day 1: Introduction to AI Agents & Site Documentation

  - Lecture: Introduction to CDCD's work and workshop objectives, including an overview of the complete workflow and expected outcomes
  - Lecture: Spatial and typological characteristics of the Taiwanese street house (街屋) and its urban context
  - Lecture & Hands-on session: Introduction to AI agents and the concept of MCP (Model Context Protocol) — guided installation and setup of Agno Agents on participants' local machines, followed by an exploration of basic functions through an example file
  - Lunch break in Hsinchu city centre
  - Site visit: participants explore and document interior spaces through photography and site observation, and begin developing scene-regeneration concepts based on their selected buildings

  Day 2: Spatial Segmentation & Image Generation

  - Hands-on session: participants work with Agno Agents to develop and generate spatial outputs based on the measurements and interior documentation collected during the Day 1 site visit. The session is structured to allow free experimentation, with the workshop team providing technical support. Participants are encouraged to test different configurations and begin forming their own design directions
  - Lunch break
  - Lecture: Image generation as a creative tool for architectural space design — introduction to key tools, techniques, and applications in spatial design workflows

- Hands-on session: participants experiment with image generation tools to generate and refine interior transformation proposals inspired by their own spatial design concepts

Day 3: 3D Reconstruction & Final Presentation

- Lecture: 2D-to-3D technologies — introduction to state-of-the-art methods and current limitations, distinction between scene-generation and object-generation techniques, and tool demonstration through selected examples
- Hands-on session: converting 2D drafts into 3D models (generated scenes and customised spatial inserts or objects), rebuilding and cleaning geometries in Rhino, and integrating and organising 3D assets
- Lunch break
- Work compilation, documentation, immersive visualisation with Apple Vision Pro, and final panel presentation of outcomes

- **Target Audience:**

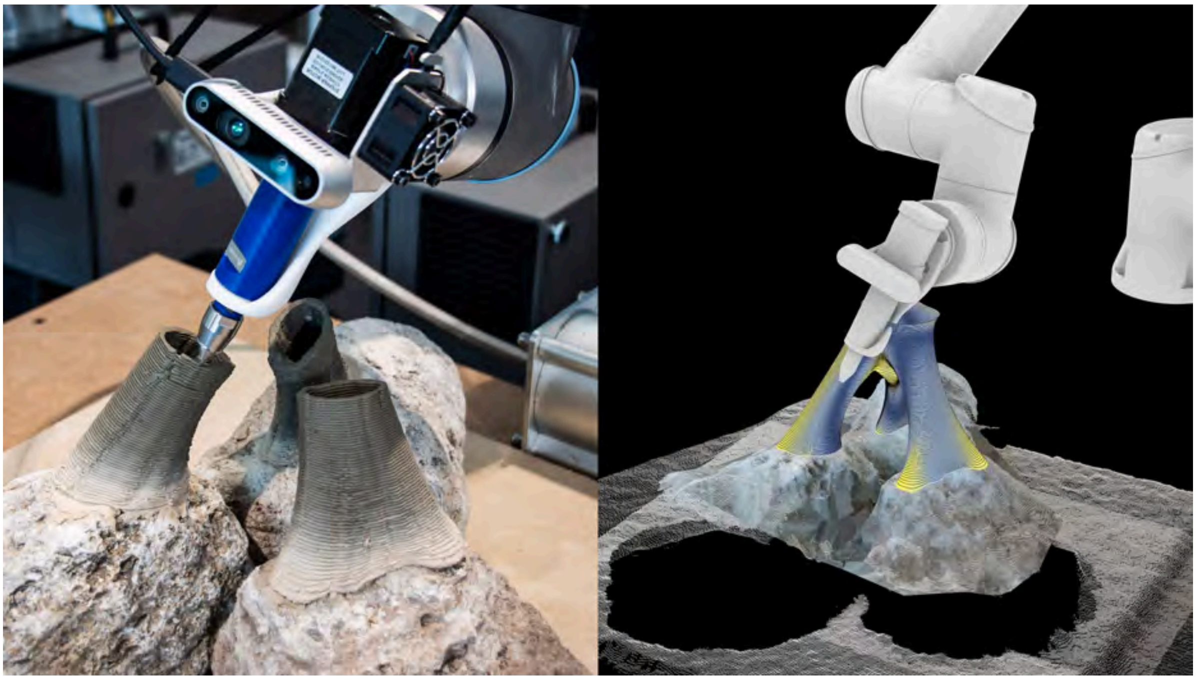
The target audience will be students and professionals in architecture, interior design, and the broader AEC field who are interested in exploring AI-driven interior design workflows based on spatial analysis and generative models. It is particularly suited for participants who want to explore how 2D–3D transformations and diffusion models can augment spatial reimagination and design ideation processes.

We expect them to have intermediate experience with 2D/3D design tools (such as Photoshop, Rhino/Grasshopper, or similar platforms), be comfortable working with digital design processes, and have basic knowledge of Python programming. Prior experience with generative models is helpful but not required. We will encourage participants to share their design concepts, work in small teams or pairs depending on the number of participants and collaboratively develop their own AI-assisted interior transformation workflows. Through hands-on exercises, participants will develop a prototype workflow that bridges spatial perception, controllable image generation, and 3D reconstruction for interior transformation.

- **Expected Outcomes:**

To be announced.

A04
Sequenced Robotic Toolpaths: 3D Scanning and Bio-Printing on Organic Topology



Description

This workshop introduces a sequential, semi-automated design-to-fabrication workflow in which computation operates as an active collaborator between human intent, material intelligence, and robotic execution. Participants will work with organic substrates (e.g., rocks) and develop non-planar bio-material printing strategies that adapt to the scanned topology of irregular forms.

The workshop situates robotic fabrication within the theme of Humanistic Computation and Intelligence by reframing computation not as a detached optimization engine, but as a mediating system that negotiates between designer intention, material morphology, and machinic constraints. Organic matter is not treated as a neutral base but as an active geometric input that reshapes design decisions and fabrication logic.

Using a custom end-effector integrating a WASP clay extruder and an Intel RealSense D435 depth camera, participants will:

- Capture real-time point clouds directly aligned to the robot TCP without external calibration through live kinematic data streaming.
- Generate computational forms that bridge projected curves on scanned meshes.
- Produce adaptive, non-planar toolpaths using heat-method distance contouring.
- Execute sequenced robotic programs through UR Real-Time Data Exchange (RTDE), enabling live monitoring of robot states, runtime feedback control, and automated program chaining.

The workflow emphasizes closed-loop intelligence, where scanning, modeling, tool orientation, extrusion control, and robotic state feedback operate within a continuous computational field. Through UR RTDE, the robot's runtime_state, joint data, and execution status are streamed in real time, allowing capture control, digital twin synchronization, and sequential toolpath execution without manual intervention.

Duration	3 day(s)	**Date**	Sun, 26 April~Tue, 28 April
Type	Technical	**Capacity**	To be announced.
Location	Guangfu Campus, NYCU, Hsinchu		
Requirements	All base Grasshopper definitions will be provided, allowing participants with intermediate knowledge to engage meaningfully without constructing the workflow from scratch. All workshop materials, including annotated definitions and documentation, will be made available through a public GitHub repository and remain accessible after the workshop. Participants are required to bring their own laptop with: - Rhinoceros / Grasshopper (Windows) - Plugins: Kangaroo, RADII Capture, Ovenbird, Robots (modified version provided with RTDE integration)		

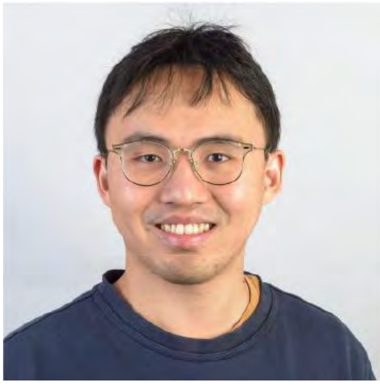
Instructor(s) Profile

Celso Urroz

Celso is a Ph.D. candidate at Florida Atlantic University whose research focuses on computational design, robotic fabrication, and ecological systems. He develops open-source design-to-fabrication workflows integrating sensing, material intelligence, and machinic control, and has led international workshops on adaptive robotic fabrication.

Heidy Sekardini

Heidy is an architecture graduate from Universitas Indonesia and a research assistant at the Performative Architecture Research Lab (PAR-Lab). Her research focuses on computational design, bio-materials, and advanced fabrication, with a particular interest in ecological integration and robotic construction.



Hangchuan Wei

Hangchuan is an architectural designer and researcher with extensive experience in computational design, robotic fabrication, bio-design, and AI. Skilled in teaching digital tools and supporting architectural studio learning through both design tutoring and technical instruction. Committed to advancing design education through interdisciplinary research and inclusive, student-centered teaching.

Logistics & Scheduling

- **Schedule:**

  Day 1 — Workflow + Scan-to-Toolpath Pipeline

  - Morning
    - Theoretical introduction: scan → mesh → toolpath → print as a sequenced robotic workflow
    - Presentation of available organic objects; participants select substrates
    - Scanning automation tests and calibration-free TCP alignment
    - Introduction to program sequencing and loop control using UR Real-Time Data Exchange (RTDE) to trigger point cloud capture
  - Afternoon
    - Toolpath orientation fundamentals: mesh surface normals → TCP planes
    - Debugging plane orientation issues (axis flipping, continuity) and strategies to avoid robotic singularities

    - First short test print (limited layer height) to validate alignment + extrusion control

Day 2 — Bio-Materials + Generative Curve Toolpaths

- Morning
    - Introduction to bio-material behavior (ductility, slump, adhesion, drying) as it relates to non-planar deposition
    - Preparation of a small set of mix variants (e.g., clay + cellulose; clay + eggshell additive), and basic testing for printability
- Afternoon
    - Generative curve systems for toolpaths (template-based): reaction–diffusion, growth logics, agent-based trails
    - Time to iterate: participants modify parameters, preview toolpaths, and run short prints on their chosen substrates

Day 3 — Multi-Object Composition + Non-Planar Final Print

- Morning
    - Preparing the final model: arranging multiple organic objects and scanning as a set
    - Curve projection + mesh relaxation to generate bridging geometries
    - Introduction to overhang mitigation (Ovenbird) and heat-method non-planar contour toolpath generation
- Afternoon
    - Final sequenced print bridging multiple irregular forms
    - Quick documentation capture (photos + short notes) and wrap-up for exhibition submission

- **Target Audience:**

The workshop is designed for architecture, design, and computational fabrication students, researchers, and early-career professionals with an interest in robotic fabrication, bio-material experimentation, and advanced toolpathing workflows. Participants should have basic familiarity with Rhinoceros and Grasshopper; prior robotic experience is not required but will be beneficial. The workshop is suitable for individuals interested in integrating sensing, material behavior, and real-time robotic control within a design-to-fabrication process.

- **Expected Outcomes:**

Participants will produce:

- A series of small-scale test prints (limited layer height) for calibration, material testing and workflow exploration
- One larger-scale bio-printed model on an irregular substrate
- Brief documentation (process images + videos)

All outcomes will contribute to the final exhibition and shared workshop repository.

A05
Exploring Plausible Futures in Computational Design: A Human-Led, AI-Supported Scenario Workshop

Description

How will architectural design practice and research evolve over the next decade? What emerging trends will reshape the field, and which critical uncertainties could send it down fundamentally different paths? This workshop equips participants with a structured, replicable methodology for exploring these questions through human-led, AI-supported scenario analysis.

Participants and generative AI work in parallel to identify trends, surface uncertainties, and construct plausible future scenario narratives for computational design. This "compare and contrast" approach makes visible the distinctive contributions of human judgment and machine analysis, directly engaging the CAADRIA 2026 theme of Humanistic Computation and Intelligence.

Learning objectives: (1) Distinguish between trends and uncertainties in the context of CAAD futures; (2) Apply a structured scenario analysis process using generative AI as an analytical support tool; (3) Critically evaluate AI-generated content against professional expertise; (4) Construct plausible scenario narratives grounded in collectively identified drivers; (5) Use scenario thinking to inform strategic decisions in design research, education, and practice.

Required software: None mandatory. Participants optionally bring laptops/tablets with Wi-Fi access and AI image/video generation accounts (e.g., Midjourney, Firefly). Workshop leaders provide pre-configured generative AI models with structured scenario analysis prompts.

Technical constraints: Reliable Wi-Fi is essential for AI interaction during the session. No specialised software or prior experience with scenario analysis is required.

Duration	1 day	**Date**	Tue, 28 April
Type	Seminar-based	**Capacity**	10 per session, two sessions. Breakout groups of 2–4 participants allow deep engagement with individual scenarios.
Location	Guangfu Campus, NYCU, Hsinchu		
Requirements	Laptop or tablet with Wi-Fi access. Personal AI image/video generation accounts (e.g., Midjourney, Adobe Firefly) for the visualization activity. No specialised software installation or technical setup is required from participants or organisers beyond the items listed above.		

Instructors Profile

Lisa LuBowden

Dr Lisa LuBowden is a Postdoctoral Research Fellow at the ARC Training Centre for Next-Gen Architectural Manufacturing, UNSW Sydney. She completed her PhD at UNSW Business School in organisational behaviour, where she researched leadership and professional capability development. Her broader research examines how expertise, judgement, and accountability develop and are evaluated in professional work, and how these dynamics shift under technological and institutional change.

At Arch_Manu, her work focuses on the architecture, design, and engineering sector, including human-led, AI-supported scenario analysis to develop plausible futures; evidence-based research on professional competency and registration standards in Australian architecture; and societal level analysis of how digital technologies reconfigure responsibility and authority for the architectural profession.

Prior to academia, Lisa led national and international standards development across construction, data, artificial intelligence, health, workplace safety, and energy, contributing deep experience in stakeholder consultation, governance processes, and evidence-based framework/policy design. She brings this combined organisational and policy expertise to support rigorous, practice-relevant research and facilitation.

Christian Criado-Perez

Dr Christian Criado-Perez is a senior lecturer working at the UNSW Business Insights Institute. His work focuses on applied research and the codesign of research projects for policy makers and practitioners, involving various sectors including the built environment. He is an organisational behaviour scholar specialising in evidence-based management and decision-making, with a strong focus on the built environment and architecture. His research examines how leaders and organisations interpret, evaluate, and apply evidence under conditions of uncertainty, digital transformation, and sustainability pressure. He has published in leading journals, including Architectural Engineering and Design Management on evidence-based practice in the built environment, and the Journal of Construction Engineering and Management on digital transformation in the Australian AEC industry.

In addition to his academic publications, he has led and contributed to major industry-facing reports and tools aimed at improving practice in the sector, including Building Better Decisions: Why good evidence is used and ignored in the built environment sector and the development of a Digital Sustainability Assessment Tool supporting climate action in architecture. As Chief Investigator at Arch_Many, he integrates advanced analytical methods with practical industry engagement.

Logistics & Scheduling

- **Schedule:**

  The workshop runs for 1 day as two identical 3-hour sessions, allowing a larger cohort while maintaining small-group dynamics essential to effective scenario analysis.

  Session 1: 9:00–12:00 | Session 2: 13:00–16:00

  Single session breakdown (3 hours):

  - Welcome & Framing (15 min): Workshop objectives; introduction to scenario analysis; the role of AI as analytical collaborator; ground rules.
    Parallel Generation (10 min): Participants brainstorm key trends and critical uncertainties in pairs. Simultaneously, the AI generates its own set using a structured prompt covering technology, regulation, sustainability, workforce, economics, and socio-cultural shifts.
  - Comparative Evaluation (30 min): Human and AI outputs displayed side by side. Whole-group discussion evaluates plausibility, novelty, overlaps, and blind spots. Group finalises a shortlist of key trends and critical uncertainties.

    Break (15 min)

  - AI Scenario Generation (10 min): AI generates 5–7 distinct, plausible scenario narratives for computational design circa 2036, each with a title, tagline, narrative, key drivers, and implications.
  - Test Scenarios (20 min): Whole-group evaluation of scenario coherence, coverage, and practical relevance. Regenerate if needed.
  - Tune Scenarios (20 min): Refinement for audience relevance — complexity, provocation level, applicability. Iterative AI refinement based on group feedback.
  - Breakout Critique & Visualization (25 min): Groups of 2–4 assess assigned scenarios for plausibility, implications, and strategic responses. Groups optionally use AI image/video generation to create visual "postcards from the future."
  - Presentations & Synthesis (20 min): Group presentations (5 min each) followed by whole-group discussion identifying cross-cutting themes and strategic implications.
  - Wrap-Up (15 min): Compile outputs, reflect on methodology transferability, and discuss key takeaways.

- **Target Audience:**

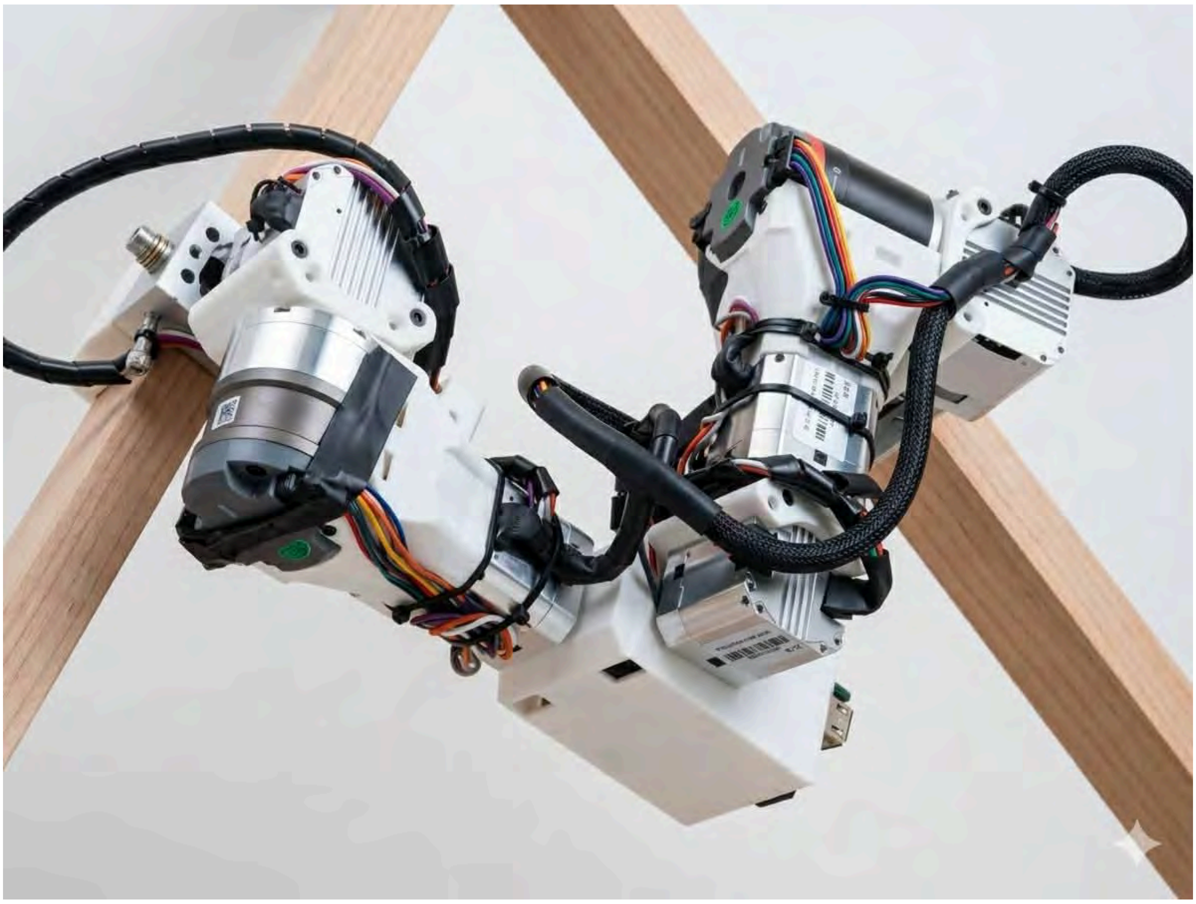
  Target audience: Computational designers, computational design researchers, educators, practitioners, and practice leaders. The workshop is relevant to anyone working at the intersection of architecture, technology, and design futures — including academics exploring AI in design, studio educators seeking foresight methods for teaching, and practitioners navigating strategic uncertainty in their firms.

  Prerequisites: None. No prior experience with scenario analysis, strategic foresight, or generative AI tools is required. The methodology is designed to be accessible to participants of all levels. Familiarity with current trends in computational design is helpful but not essential — the workshop's collaborative structure ensures knowledge is shared across the group. Participants optionally bring a laptop or tablet with Wi-Fi access and AI image/video generation accounts (e.g., Midjourney, Firefly) for the visualization activity, though this is not mandatory.

- **Expected Outcomes:**

  Participants leave with a set of plausible future scenarios for architectural design co-developed by humans and AI, visual "postcards from the future" created through AI image/video generation, and a transferable foresight methodology they can replicate in their own research, teaching, and practice contexts.

A06
Human–Machine Collaborative Assembly Using Relative Robotic System



Description

This workshop introduces participants to robotic modular assembly using relative robotic systems. Unlike conventional ground-based robots that operate within fixed global reference frames, relative robots navigate directly on partially assembled structures, enabling scaffold-free, adaptive, and spatial construction processes.

The workshop covers:

- Modular timber component and joint design;
- Robotic control and simulation workflows;
- On-site human–robot collaborative assembly

Participants will work in groups to construct a modular timber truss system using 3D-printed joints. Using the provided parametric design tools, each group will develop an assembly logic and evaluate feasibility through simulation. Participants will test their strategies through robotic simulation and interact with on-site robots for prototyping and validation.

Learning objectives

Participants will:

- Understand the difference between ground-based and relative robotic systems;
- Gain basic knowledge of motion planning and control of relative robots;
- Evaluate assembly strategies through simulation and physical prototyping

Required software:

Participants will use custom design and control software based on ROS. Basic familiarity with Python programming is preferred but not required.

Technical constraints:

The size and geometry of the final structure will depend on venue conditions and spatial constraints. Timber materials may require advanced preparation and shipping depending on the conference location.

Duration	3 days	**Date**	Sun, 26 April~Tue, 28 April
Type	Technical	**Capacity**	6
Location	Guangfu Campus, NYCU, Hsinchu		
Requirements	Prior experience in robotics or programming is helpful but not required. All robotic workflows will be introduced during the workshop. Participants need to bring a laptop capable of running Rhino/Grasshopper and the provided simulation tools.		

Instructors Profile

Mike Xie

Prof Yi Min 'Mike' Xie AM is an Honorary Professor at RMIT University, Australia, and Professor and Dean of the College of Future Technologies at Hohai University, China. He was an Australian Laureate Fellow, RMIT Distinguished Professor, and Founding Director of the Centre for Innovative Structures and Materials. He is a Fellow of the Australian Academy of Technological Sciences and Engineering and a Foreign Member of the Chinese Academy of Engineering. His team pioneered the Evolutionary Structural Optimisation (ESO) and Bi-directional Evolutionary Structural Optimisation (BESO) methods, which have been widely adopted by engineers and architects worldwide to design innovative structures, including several landmark buildings.

Nic Bao

Dr Nic Bao is a Senior Lecturer in Architecture, PhD supervisor, and Architecture Technology Course Coordinator at School of Architecture and Urban Design, RMIT University. His research focuses on architecture, computational design, structural optimisation, robotic fabrication, and intelligent construction. Nic is a registered architect in Australia and the US, and a RIBA Chartered Architect in the UK. He is Director of BW Architects, Founder of FormX Lab, and Partner at Ameba. His work has been widely published and exhibited internationally, including at UABB, Venice Biennale, and Melbourne Design Week. He also serves as Secretary of CAADRIA and DigitalFUTURES, and Deputy Chair (VIC) of the Prefab Council of Australia.

Qiang Zhan

Qiang Zhan is a PhD candidate at the Centre for Innovative Structures and Materials (CISM), RMIT University, supervised by Professor Mike Xie and Dr. Nic Bao. He is also a research assistant in FormX Lab. His research focuses on design of robotic systems and modular assembly in construction automation. Before joining RMIT, Qiang completed his master's degree under Professor Philip Yuan at Tongji University, where he specialized in additive manufacturing and robotic fabrication.

Logistics & Scheduling

- **Schedule:**

  This workshop is structured as a progressive workflow from design to simulation to robotic interaction.

  Day 1 — Introduction and Setup

  Participants are introduced to the concept of human–machine collaborative assembly and the relative robot's navigation system. Teams generate digital models of timber stick structures and prepare materials for assembly.

  Day 2 — Human–Robot Collaborative Assembly

  Participants operate the relative robot on a partially built structure while coordinating human tasks such as material delivery and joint fixation.

  Day 3 — Completion and Exhibition

  Teams finalize their assemblies, test precision and reconfigurability, and prepare their work for the conference exhibition.

- **Target Audience:**

  The workshop welcomes interdisciplinary participants from architectural geometry, robotics, and construction research.

- **Requirements:**

  Prior experience in robotics or programming is helpful but not required. All robotic workflows will be introduced during the workshop. Participants need to bring a laptop capable of running Rhino/Grasshopper and the provided simulation tools.

- **Expected Outcomes:**

  An optimised timber lattice structural installation assembled through human–robot collaboration. The final outcome will be a small-scale spatial prototype demonstrating the coordinated interaction between robotic systems and human participants in assembling lightweight timber lattice structures.

B01
Co-Authoring Timber: Humans, Algorithms, and Robots

Description

This three-day workshop is aimed at architects and computational designers seeking a deeper integration of parametric design and robotic fabrication in timber construction. Participants will be introduced to an end-to-end timber design-to-fabrication pipeline developed at Gramazio Kohler Research, combining semantic modeling, distributed orchestration, and robotic execution within a coherent open-source ecosystem.

Working in Rhino/Grasshopper, participants will use COMPAS Timber to develop fabrication-aware timber structures based on semantic modeling principles, ensuring that geometry, joinery, and assembly logic are embedded from the outset. The pipeline extends beyond modeling to include robotic path planning and assembly sequence using open-source tools, directly linking design intent to machine execution.

In the final stage, participants will employ a newly developed open-source distributed fabrication orchestrator to define production logic and sequencing, and assemble a timber structure using an ABB robot controlled through an open-source execution library. The workshop culminates in a fabricated prototype and a reproducible workflow that demonstrates how computational design, distributed systems, and robotics can operate within a unified timber construction process.

Duration	3 days	**Date**	Sun, 26 April~Tue, 28 April
Type	Technical	**Capacity**	6
Location	ROSO, FCU, Taichung		
Requirements	Hands-on design and planning - Rhino8/Grasshopper (including license) - Additional open-source software will be provided		

Instructor Profile

Chen Kasirer

Chen Kasirer is a software engineer at Gramazio Kohler Research, focusing on crafting open-source software solutions for the architecture, engineering, and construction (AEC) fields.

He advocates for thoughtful software design and his contributions are aimed to bridge the gap between research and industry application. Chen is also a member of the core development team for the COMPAS Framework and played a role in founding the COMPAS Association.

Chen's earlier professional experiences include developing software for penetration testing in the automotive sector, offering consultancy on virtualization infrastructure, and working as an IT engineer in leading companies. He holds a BSc in Computer Science from Ulm University of Applied Sciences in Germany, with specialization in both computer graphics & vision and computer engineering.

Logistics & Scheduling

Schedule:

Day 1 — Foundations and Overview (8h)

- Morning Session

    - Introduction to Gramazio Kohler Research and the conceptual framing of end-to-end timber design-to-fabrication workflows
    - Overview of the open-source COMPAS framework and COMPAS Timber, with emphasis on semantic modeling and fabrication-aware timber design.
- Afternoon Session
    - Introduction to the distributed fabrication pipeline: Antikythera for process orchestration and COMPAS RRC for ROS-based ABB robotic execution.
    - Presentation of the reciprocal frame design system in Grasshopper and explanation of how modeling, sequencing, and robotic control are connected within a unified workflow.
    - Installation of all the necessary tools.

Day 2 — Computational Design and Fabrication Logic (8h)

- Morning Session
    - Hands-on development of timber structures using a design system based on COMPAS Timber in Grasshopper.
    - Exploration of joinery strategies and fabrication constraints embedded in the semantic model.
- Afternoon Session
    - Integration of robotic considerations into the design: path planning for assembly (via TACO/COMPAS Integration), and refinement of designs in preparation for robotic execution.

Day 3 — Orchestration and Robotic Assembly (8h)

- Morning Session
    - Development of an Antikythera blueprint or sequencing logic derived from the design strategy.
    - Linking semantic models to fabrication tasks and validating the digital production pipeline.
- Afternoon Session
    - Robotic pick-and-place assembly of pre-fabricated timber elements using an ABB robot controlled through COMPAS RRC.
    - Review of the fabricated prototype and discussion of the integrated parametric, orchestration, and robotic workflow.

Target Audience:

The ideal target audience are architects and computational designers.

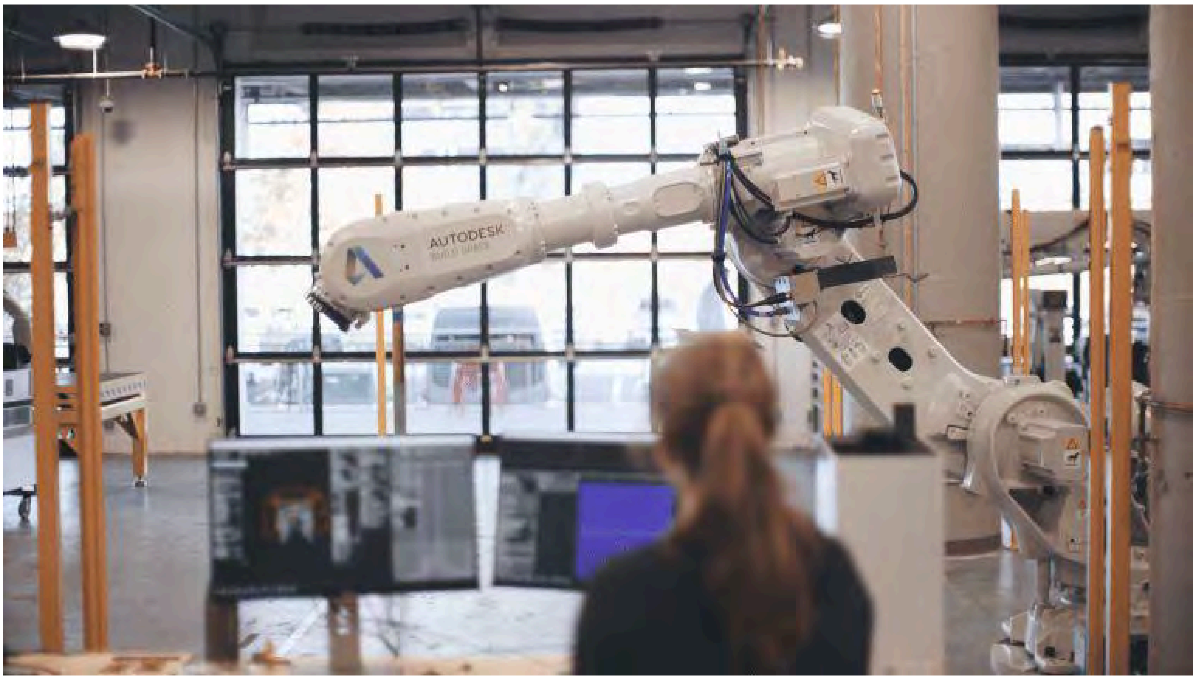
Prior experience: Computational design experience and familiarity with Grasshopper is expected. Python programming knowledge is not required but it's a plus.

Expected Outcomes:

To be announced.

B02

Embodied Intelligence: Designing UX/UI Workflows for Robotics



Description

In this 2-day intensive, participants design, develop, and demo novel interactions with industrial robots and other CNC machines. Using cmd_space — our intuitive node-based software and sensor suite — participants rapidly experiment with how different robotic form-factors and interaction techniques enable new ways for machines to respond and relate.

cmd_space does two things: it abstracts away robotics complexity so designers can focus on behavior and expression, and it creates playful, low-friction experimentation. Just as Human-Computer Interaction (HCI) democratized software design, robotics now needs the same shift: moving from specialized engineering toward a creative discipline where architects, artists, and designers shape how machines feel and behave. This workshop sits at that inflection point, showing how accessible tools help robotics embrace the ingenuity and imagination of creative practitioners.

A robot designed to respond—to voice, gesture, presence—instantly gains personality. Participants learn to map sensory input directly to robot motion, discovering how responsiveness itself creates intentionality. Through spatial design, behavioral strategies, and interaction techniques, they prototype machines that feel alive rather than automatic. As robotics embeds itself in daily life, "how does it make me feel?" becomes the design question that matters most. This workshop reframes robots from industrial infrastructure into expressions of intelligence and agency.

Duration	2 days	**Date**	Sun, 26 April~Mon, 27 April
Type	Technical	**Capacity**	6
Location	ROSO, FCU, Taichung		
Requirements	Familiarity with Python or visual programming is encouraged but not required; no robotics experience required.		

Instructor Profile

Madeline Gannon

Dr. Madeline Gannon is a pioneering designer and technologist who tames industrial robots to make us feel. Known as the "Robot Whisperer," her work bridges cutting-edge robotics, AI, and the human experience, proving that creativity is essential to shaping how these technologies impact society. As a former NVIDIA roboticist, she brings deep technical fluency to building more optimistic futures with machines.

Dr. Gannon's work is in the permanent collection of the Copernicus Science Centre and has been exhibited at cultural institutions worldwide. She has been recognized as a World Economic Forum Cultural Leader and named among the world's most influential women in robotics by Analytics Insight. Her work has been profiled by the BBC, NPR, the Guardian, Financial Times, WIRED, and FastCompany. She has held research positions at NVIDIA, and received residencies and awards from ETH Zurich, Autodesk, Carnegie Mellon, and the Knight Foundation. She holds a Ph.D in Computational Design from Carnegie Mellon University and a M.Arch from Florida International University.

Logistics & Scheduling

Schedule:

DAY 0: OPTIONAL

Participants can come spend time with us and ask questions as we set up the workshop for the next day.

DAY 1: FOUNDATIONS & INTERFACE DESIGN

- Robotics ecosystem overview: hardware affordances and limitations (45 min)
- UX/UI principles for embodied systems: from behavior design to control interfaces (60 min)
- cmd_space workflow overview: wrapping Python projects for intuitive robot control (45 min)
- Hands-on robot & sensor exploration with provided kits (60 min)
- Ideation & team formation (30 min)

DAY 2: PROTOTYPING & EXHIBITION

- Rapid prototyping with technical support (3 hours)
- Playtest and iterate on interaction design (60 min)
- Temporary installation and internal showcase (60 min)
- Documentation and reflection on emerging patterns (30 min)

Target Audience:

Professionals and advanced students in architecture, design, creative technology, and anyone interested in human-computer interaction and embodied AI.
Prerequisites: Familiarity with Python or visual programming is encouraged but not required; no robotics experience required.

Requirements:

Familiarity with Python or visual programming is encouraged but not required; no robotics experience required.

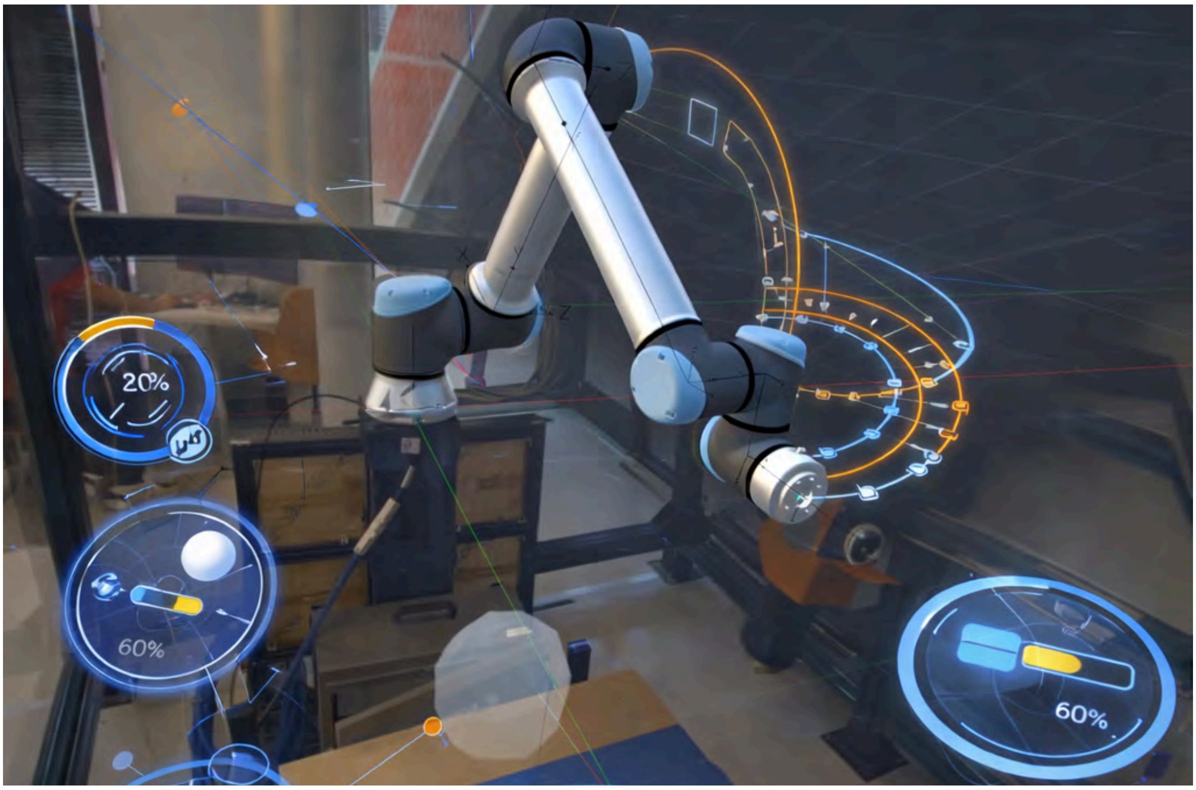
Expected Outcomes:

Participants will understand:

- How UX/UI design principles apply to robot behavior and control
- Strategies for rapid prototyping with embodied AI systems

- Spatial and interaction design considerations for robotic installations
- Workflow tools that make robotics accessible to non-specialists
- Safety best practices for robots in shared spaces

B03
Spatial Interfaces for Real-Time Human–Robot Collaboration



Description

This three-day workshop explores spatial computing as a humanistic interface layer for real-time human–robot collaboration. Rather than treating robotic control as a coding task or pre-scripted automation pipeline, the workshop reframes collaboration as an interface design problem, where embodied spatial interaction mediates agency, authorship, and decision-making.

The workshop challenges the conventional serialized model of design and fabrication—where design is finalized before execution—and instead proposes robotic processes as an ongoing dialogue between designer, machine, material, and environment. Parameters remain negotiable throughout execution, enabling continuous adjustment and interpretation.

Participants design three-dimensional interface objects in Blender that function as behavioral mediators rather than static geometry. Using Animaquina, a procedural robotics environment, and MQTTouch, an IoT-based communication layer, spatial transformations are translated into live robotic motion and task-specific parameters. These parameters may influence trajectory, velocity, force, timing, actuation states, or other process variables depending on the selected task.

Robotic systems are positioned not as autonomous replacements but as responsive collaborators. Participants manipulate spatial objects in XR to dynamically influence robotic behavior while observing immediate system response. Tasks may include motion choreography, drawing, assembly, adaptive tool operations, or sensor-driven reactions.

This real-time feedback loop positions computation as augmentative and distributed across humans, interfaces, machines, and materials. Intelligence emerges through continuous negotiation rather than pre-scripted automation.

Aligned with CAADRIA 2026's theme Humanistic Computation and Intelligence, the workshop investigates how embodied interaction reshapes computational authorship. Over three days, participants prototype, test, and execute working systems that connect XR interaction, MQTT communication, and robotic behavior, culminating in live execution and documented prototypes exhibited during the conference.

Duration	3 days	**Date**	Sun, 26 April~Tue, 28 April
Type	Technical	**Capacity**	6
Location	ROSO, FCU, Taichung		
Requirements	Participant laptops capable of running Blender (GPU recommended).		

Instructor(s) Profile

Luis Arturo Pacheco

Luis Arturo Pacheco is an Assistant Professor of Architecture at Florida Atlantic University and Director of the Interactive Machines Lab, where he leads research at the intersection of computational design, robotics, and digital fabrication. His work focuses on developing intuitive robot control interfaces for creative professionals and advancing novel workflows for large-scale and construction-oriented digital manufacturing. He is also a Doctor of Design candidate at Florida International University, where his dissertation investigates procedural robot control, modular hardware integration, and interface design for architectural robotics.

Logistics & Scheduling

Schedule:

Day 1 – System Foundations & Live Demonstration (6–7 hrs)

- Objective: Establish system literacy and demonstrate real-time human–robot interaction.
- Introduction to computation and human–robot collaboration
- Overview of the workflow: Blender + Animaquina + MQTTouch + robot
- Live demonstration of real-time spatial control driving robotic motion and tool parameters
- Hands-on setup: installing and configuring software
- First exercise: spatial object controlling simulated robot in real time
- Outcome:
  Participants establish a working pipeline from spatial interface → MQTT → robot simulation.

Day 2 – Guided Interface Development (6–7 hrs)

- Objective: Design and implement custom spatial control systems.
- Development of spatial interface objects in Blender
- Mapping transformations (position, rotation, scale) to robotic parameters
- Introduction to MQTTouch for combining inputs and real-time parameter tuning
- Iterative testing in simulation or with physical robot
- Outcome:
  Each team produces a functional human-in-the-loop control prototype capable of live parameter modification.

Day 3 – Execution & Fabrication (6–7 hrs)

- Objective: Execute and document real-time collaborative fabrication.
- Live robotic execution
- Mid-process human intervention and parameter adjustment
- Refinement
- Documentation: short video + system diagram
- Preparation of materials for exhibition at CAADRIA
- Outcome:
  Participants demonstrate a real-time spatial interface driving robotic fabrication, supported by documentation and diagrams for conference exhibition.

Target Audience:

To be announced.

Requirements:

Participant laptops capable of running Blender (GPU recommended).

Expected Outcomes:

- Day 1 – System Foundations & Live Demonstration
  Participants establish a working pipeline from spatial interface → MQTT → robot simulation.
- Day 2 – Guided Interface Development
  Each team produces a functional human-in-the-loop control prototype capable of live parameter modification.
- Day 3 – Execution & Fabrication
  Participants demonstrate a real-time spatial interface driving robotic fabrication, supported by documentation and diagrams for conference exhibition.

C01

Lamina: An Integrated Design-to-Fabrication Framework for Concrete 3D Printing in Architecture

Description

Three-Dimensional Concrete Printing (3DCP) is rapidly emerging as a transformative construction technology, yet architectural design workflows often lag behind its technical advancements, limiting its broader adoption. This workshop introduces Lamina, a software platform developed to bridge this gap by guiding architects to design for 3DCP through three integrated components: the assessor, optimiser, and generator. Participants will engage in a hands-on design process that explores the opportunities and constraints of 3DCP, progressing from an initial architectural sketch, architectural and structural optimisation, to toolpath generation (G-code) and the production of a physical 3D-printed prototype. By embedding design intelligence directly into fabrication workflows, the workshop reflects a shift toward more resilient and technologically adept architectural practice.

Learning objectives

1. Learn how to design for concrete 3D printing
2. Optimise material and printing time
3. Explore the new formal language offered by this technology
4. Generate a printable G-code and monitor the printing process.

Method

Participants will actively prototype through a structured and iterative making process. Working on a small-house design, they will first assess printability, then iteratively optimise the geometry for structural performance, material efficiency, and architectural intent in response to printer constraints. Designs are then segmented into printable clusters, translated into G-code, and sequenced for fabrication.

Required Software: Rhino 7 or 8 and Grasshopper

Technical constraints: Availability of a concrete 3d printer in the form of a small gantry printer (2x2 m) or a robot.

Duration	2 days	**Date**	Sun, 26 April~Mon, 27 April
Type	Seminar-based and technical instructions to print the 3D outcome	**Capacity**	6
Location	College of Design, YunTech, Yunlin		
Requirements	Software: Rhino 7 or 8 and Grasshopper		

Instructors Profile

Zayad Motlib

Zayad Motlib is an interdisciplinary architect, designer, and researcher specialising in digital design and sustainable systems. He currently leads the CRC-P computational design division at Arch_Manu, UNSW, focusing on innovative 3DCP processes, including the development of Lamina software. In 2014, he founded AmorphouStudio, an award-winning firm in Dubai and Sydney. He also founded d-NAT, a research network exploring design, nature, and technology. His current research examines human interaction with evolutionary algorithms in architecture, fostering a collaborative design process that integrates human creativity and computational intelligence.

Mahdi Fard

Mahdi Fard is an affiliated PhD researcher at Arch_Manu and Founder & R&D Lead at Ardaena. His work bridges academia and industry through data-driven computational design, AI-integrated DfMA, and intelligent automation. He develops Agentic-AI workflows for free-form structures, complex façade systems, and decarbonisation in the AEC sector.

Logistics & Scheduling

Schedule:

Daily breakdown (2-day workshop)

26th April

- 9:30 am - 12:30 pm Lecture on 3DCP and Introduction to Lamina structure and functionalities.
- 1:30 – 4:30 Tutorials (Design exercise)

27th April

- 9:30 am – 12:30 pm Tutorials (Design exercise)
- 1:30 – 4:30 pm   Preparing images and concrete 3D printing

Target Audience:

Architectural and engineering students and practicing architects or engineers with a Beginner–Intermediate level of Rhino/Grasshopper experience.

An ideal cohort of 6 participants ensures effective interaction, hands-on engagement, and access to equipment.

Requirements:

Software: Rhino 7 or 8 and Grasshopper

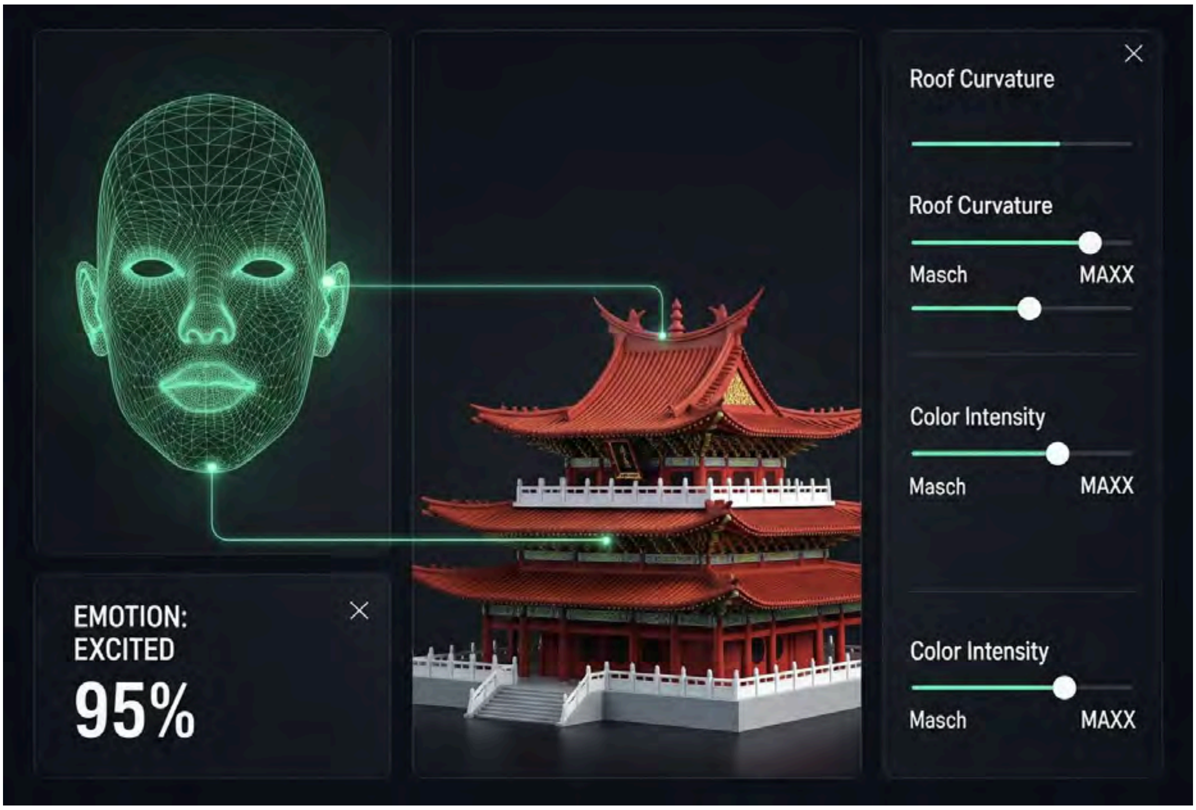
Expected Outcomes:

The workshop can be delivered under two possible setups, depending on available facilities.

1. Without access to a concrete 3D printer:
   Each participant would produce a simulation of the final print based on the G-Code, and 3-4 rendered images of their printed design for the A0 poster.
2. With access to a concrete 3D printer:
   In addition to the above outcome, if there is access to a concrete 3D printing facility, a selected wall segment from one participant's design will be printed at a maximum scale of 1 × 1.4 m for demonstration and discussion.

C02

Resonant Divine Realm: Emotion-Driven Taiwanese Wangye Temple Design Workshop



Description

This workshop expands the visual symbols of Taiwan's Wangye faith from "deity clothing patterns" to "macro temple architectural aesthetics" (e.g., swallowtail ridges, saddleback roofs, cut-and-paste crafts, Koji pottery, caisson ceilings, etc.). As a local guardian deity, Wangye's temple is not merely a center of faith but a sanctuary that brings peace to the human mind.

This workshop will integrate "Emotion Sensing Technology," using webcams to capture participants' facial expressions and micro-physiological data (e.g., joy, calm, sadness, anger, etc.). These "intangible emotional data" will then be translated into "tangible Taiwanese architectural design parameters." For example:

- Calm / Relaxed: Translated into smooth and streamlined "water-style saddleback" roofs, steady bluestone carving textures, and low-saturation traditional wooden colors, creating an introverted space for meditation.
- Excited / Intense: Translated into towering and sharp "swallowtail ridges," gorgeous and complex "octagonal caisson ceilings," dynamic flying dragon cut-and-paste crafts, and strong red, black, and gold contrasting colors.

Participants will learn how to deeply deconstruct traditional Taiwanese temple elements and use their own emotional states as core variables. By utilizing generative AI or 3D modeling tools, they will create an "Emotion-Driven Mind-Temple" exclusively reflecting their current state of mind.

Duration	2 days	**Date**	Sun, 26 April~Mon, 27 April
Type	Technical	**Capacity**	12~16
Location	College of Design, YunTech, Yunlin		
Requirements	No advanced programming background is required (modular tools or easy-to-use AI interfaces will be provided for the technical phases). Participants: MUST bring their own laptops and webcams (cameras) for real-time emotion sensing and 3D modeling.		

Instructors Profile

Wingly Shih

Wingly Shih, Ph.D., is an Assistant Professor of Visual Communication Design at National Yunlin University of Science and Technology. He holds a doctorate in Computer-Aided Design and Digital Architecture from National Chiao Tung University. His expertise integrates Human-Computer Interaction (HCI), Virtual/Mixed Reality (VR/MR), and AI-driven design. In addition to academia, Dr. Shih serves as the IT Manager at technology start-ups. An internationally recognized designer, he has earned multiple MUSE Design Awards, including a 2023/2024 Platinum Winner for "Tainan 400 - Rising from the Pages of Time". His work focuses on data visualization and generative media, bridging the gap between technical innovation and creative expression.

Cai-Ting Su

Cai-Ting Su is a designer and researcher from the Department of Visual Communication Design at National Yunlin University of Science and Technology. Her work focuses on cultural design, visual communication, and design education. She is particularly interested in exploring how traditional cultural elements can be reinterpreted through contemporary design. She has organized and led cross-cultural design workshops connecting Taiwan and Indonesia, guiding students to explore cultural imagery through creative practice. Her research focuses on Taiwanese temple culture and visual aesthetics, translating cultural symbols into design-based learning experiences. Through both teaching and design practice, she aims to bridge cultural heritage and contemporary visual design, encouraging new ways of understanding culture through creative exploration.

Logistics & Scheduling

Schedule:

DAY 1: Deconstruction & Sensing

9:00 - 12:00: Cultural Foundation & Emotion Sensing

- Icebreaking and workshop objectives overview.
- Introduction to the Wangye faith and the cultural significance of the Temple Courtyard (Miaocheng).
- In-depth analysis of traditional Taiwanese temple architectural design elements (swallowtail ridges, saddleback roofs, dougong brackets, etc.).

13:30 - 16:30: Emotion Sensing Frameworks & Analysis

- Introduction to emotion sensing frameworks (e.g., Google MediaPipe) and the core concepts of emotion-driven design.
- Treating emotions as digital parameters: Participants will learn how to conduct real-time emotion detection and perform numerical analysis based on their facial expressions.

DAY 2: Generative Implementation & Exhibition

9:00 - 12:00: Technical Implementation & Form Generation

- Hands-on technical tutorial: Practically using emotions as input parameters.

- Connecting emotion data to AI generative models/3D software to parametrically control the generation of the temple's 3D morphology and shapes.

13:30 - 16:30: Exhibition Prep & Output Generation

- Finalizing the 3D architectural models and rendering.
- Poster creation, layout design, and printing.
- Exporting final 3D models in glTF format for digital display.
- Final exhibition setup, sharing, and group photo.

Target Audience:

- Students in design-related majors (Visual Communication, Industrial Design, Architecture, Spatial Design).
- Creators or cross-disciplinary students interested in Traditional Cultural Innovation, Interactive Tech-Art, and Parametric Design.

Expected Outcomes:

Exhibition posters detailing the emotional mapping and design concept.

Interactive 3D model files exported in glTF (.gltf / .glb) format and a presenting web page.