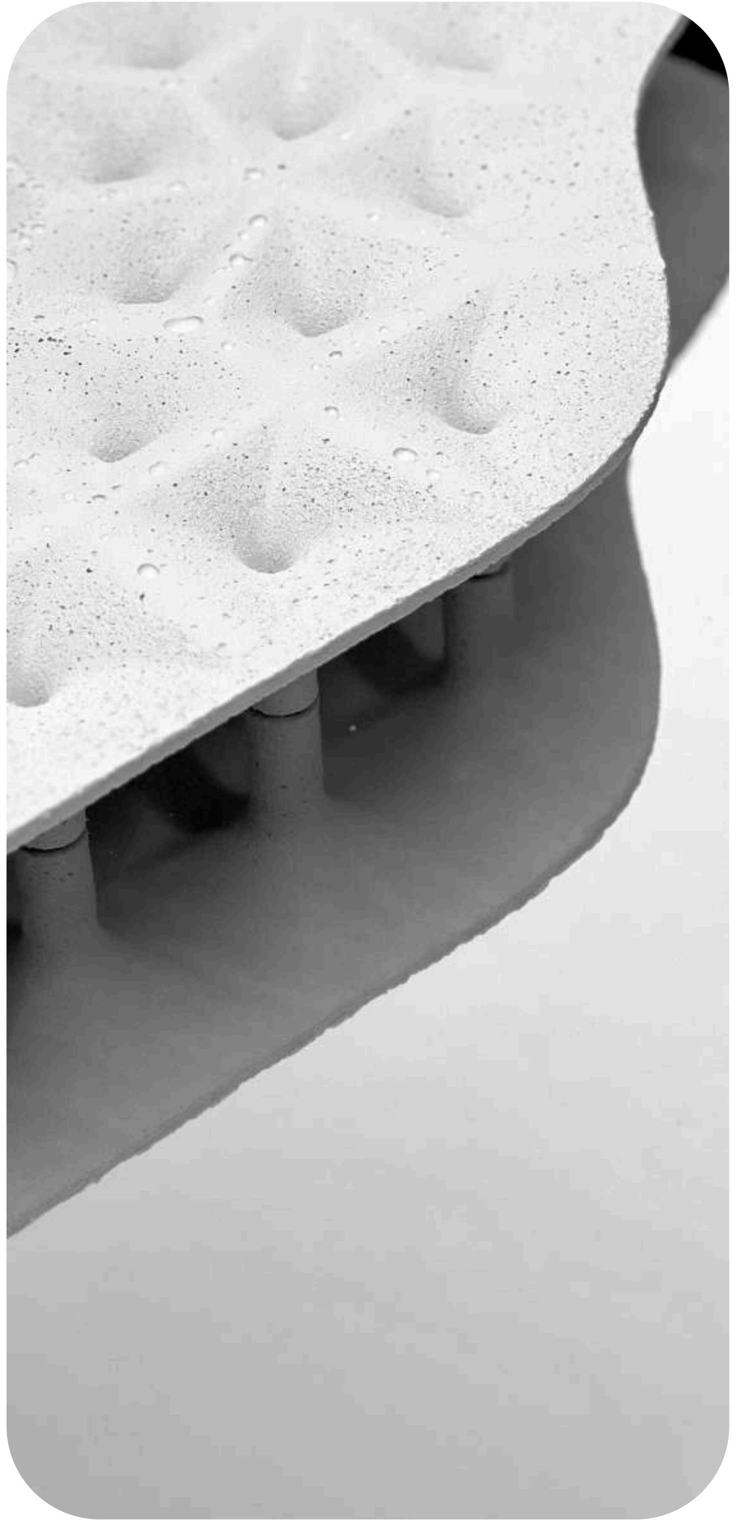


Portfolio
Matea Pinjušić

Info

Matea Pinjušić, mag. ing. arch.
pinjusic.matea@gmail.com

https://www.linkedin.com/in/matea-pinjusic/
https://blog.iaac.net/user/mateapinjusic/

University of Zagreb +
Politecnico di Milano +
Institute for Advanced Architecture of Catalonia +
Architectural Association

Education

07/2016 - 02/2023 Faculty of Architecture, University of Zagreb
02/2022 - 07/2022 Politecnico di Milano
09/2024 - 09/2025 Institute for Advanced Architecture of Catalonia
07/2025 - 08/2025 Architectural Association, DLAB

Work experience

10/2017 - 03/2019 assistant of Descriptive Geometry**, University of Zagreb**
10/2019 - 07/2020 internship, **Dva arhitekta**
08/2022 - 09/2022 internship, **Scuderia Zagreb**
04/2023 - 03/2025 architect, **NFO**

Languages

croatian, native
english, C1
italian, B2

Awards and exhibitions

2022 **Rector's award:** Material speculation
https://www.kontejner.org/program/izlozba-spekulacije-o-materijalu-istrazivanja-o-materijalnim-fenomenima-u-kontejner-u/

2022 **Teatro Arsenale:** Quando la natura incontra l'architettura
https://www.teatroarsenale.it/wp-content
uploads/2022/12/2022.05.30.invito.Quando.l.architettura.incontra.la_.natura.Polimi.Arsenale.web_.pdf

2023 **World Architecture Student Award:** Olive grove architectonic
https://www.zenkokukenkomi.com/worldarchitecturestudentaward2023-compe/wsl2023-english

2023 **Pratt institute:** Climate Collectivism: KM3
https://architecture.pratt.edu/articles/climate-collectivism-exhibition-closing-reception

2023 **2nd prize:** 'Kindergarten Valmade'
https://nfo.hr/portfolio/competition-for-conceptual-architectural-and-urban-design-kindergarten-pula/

2024 **5th prize:** 'Kindergarten Jarun'
https://nfo.hr/portfolio/kindergarten-in-pula/

2025 **IAAC:** Prototyping the Future,
https://iaac.net/agenda/iaac-exhibition-2025/

2025 **Architectural Association:** DLAB Visiting school
https://dlab.aaschool.ac.uk/programme/

Programme knowledge

Computation: Grasshopper, Python, Rhino.Inside
BIM: Archicad, Revit, Speckle
3D modeling: Rhino, Sketchup
Visualisation: Comfy UI, Twinmotion, Lumion, Photoshop, Indesign, Figma

Selected projects by topics

Thesis

Olive grove architectonics.............................4-5

Prototyping

Olive grove architectonics model.....................6
Morpholock, AA Dlab......................................7-8

Computational design

Parasyte: Growing exisiting structure.......9-10
Ensō Hyperbuilding: Services....................11-12
Dataset: Image to 3d...13

Copilot and web apps

AI Community Spaces.................................14-16
Pot maker app..17
Panton vs Lumon:..18-19

Practice

Kindergarten Valmade...............................20-21
Kindergarten Jarun.....................................22-23
Primary school OKŠ....................................24-25

Participation in practice

Hotel Red Island, 2020
topic/stage: construction documents, interior design
tools used: autocad

House Srebrnjak, 2020
topic/stage: strategic definition, concept stage, schematic design (SD)
tools used: autocad

House O, 2022
topic/stage: strategic definition, concept stage, schematic design (SD)
tools used: archicad, twinmotion

Houses Plehuti, 2022/23
topic/stage: design development (DD), construction documents (CD), interior design
tools used: archicad, lumion, sketchup

House Rado, 2025
topic/stage: technical elevator installation, construction documents (CD)
tools used: archicad, autocad, sketchup

Primary school OKŠ, 2022/23
topic/stage: concept stage, schematic design (SD), design development (DD), construction documents (CD)
tools used: archicad, sketchup, lumion

Primary school Čakovec, 2025
topic/stage: concept stage, schematic design (SD), interior design
tools used: sketchup, lumion

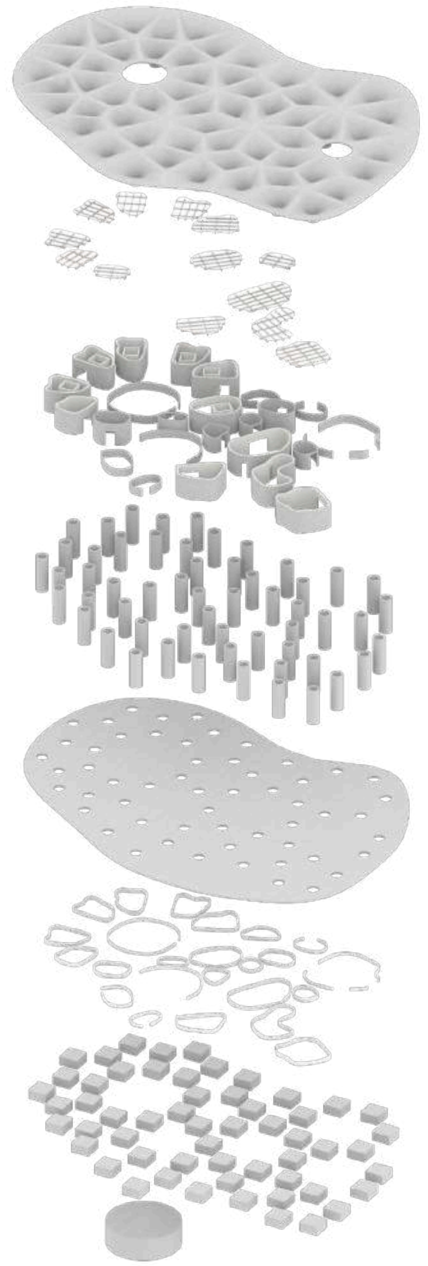
Kindergarden Valmade, 2023
topic/stage: competition
tools used: autocad, sketchup, lumion

Kindergarden Jarun, 2024
topic/stage: competition
tools used: autocad, sketchup, lumion

High school Popovača, 2024
topic/stage: strategic definition, concept stage, schematic design (SD)
tools used: autocad

Glina Center, 2024
topic/stage: Construction Documents (CD)
tools used: archicad

Petnja Center, 2024/25
topic/stage: strategic definition, concept stage, schematic design (SD)
tools used: archicad, sketchup, lumion, autocad



Olive grove architectonics

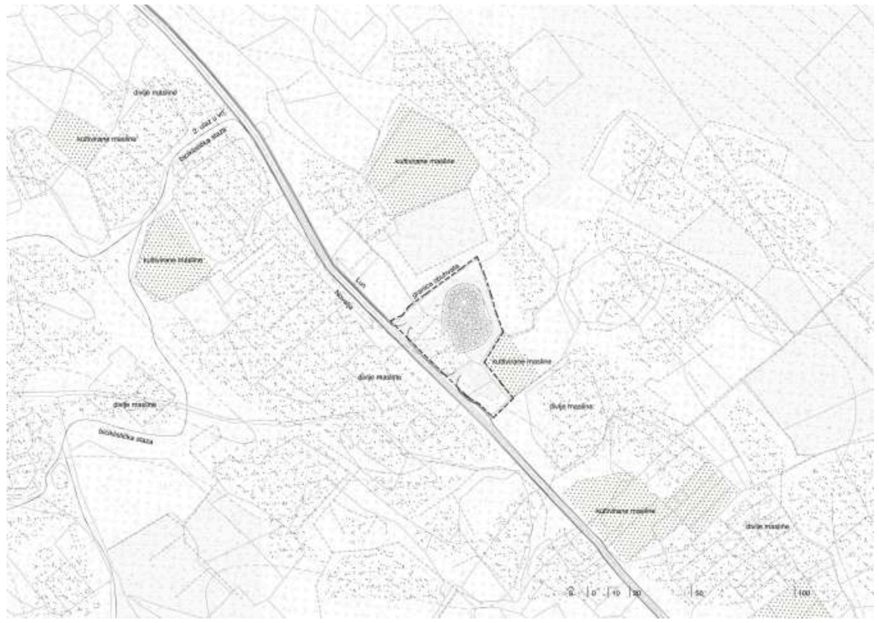
mentor: Leo Modrčin
location: island of Pag, Lun, Croatia
academic year: 2022/23

https://www.arhitekt.hr/hr/radovi/rad/arhitektonika-maslinika,480.html
programmes used: rhino, grasshopper, twinmotion

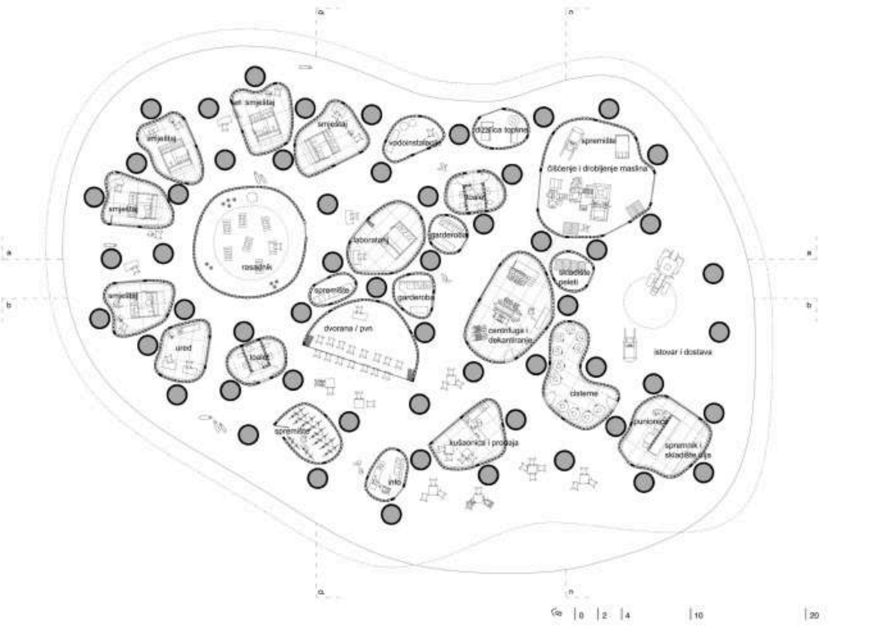
On the bare island of Pag, with a **landscape like the Moon**, a special vegetation, a wild olive grove, has been developing for years. That area, Lun, as an oasis in the desert, gives life to the island. The relationship to the **thousand-year-old olive tree** is like the relationship to life and space. They grow according to the secret plan of 'bura' wind and salt, and in that space there is a constant struggle between elemental forces and nature. The importance of **sheep** in this area is great because, as long as they are released freely, they will eat dry grass and thus prevent the possible occurrence of a fire in the olive grove. In addition, they also worked on the special shaping of the drywall and the addition of the last layer, which is called the tooth, which prevents the sheep from jumping from one part to another. Drywall, in addition to being created by the clearing of rocky soil, serves to control movement. Another name for olive trees is 'columns of Lun', in which a parallel can already be drawn with architecture. In addition to the visible world of the canopy, in the stone **rock, secrecy and darkness**, there is a whole network of intertwined roots that can be up to three times larger than the visible part of the olive tree. Due to the erosive soil, the rain just passes through it, and the water is difficult to stay in that zone. This is the first and most basic problem with olive groves. The garden can seem like a city of olives, in a literal sense, because of the problems with the ownership of this area. Each **olive tree** is like a cadastral parcel by itself, on a surface that most likely belongs to another owner or is owned by the Republic of Croatia. The combination of these two problems gives birth to the idea of the project, that is, the question of how to systematically solve the irrigation of the entire olive grove from a third location outside the olive grove. By researching and processing data from DHMZ, the calculation of the average amount of precipitation since 2014 in the area of Luna was carried out. Given that olive trees need a larger amount of water from April to September, that's when they need irrigation the most. **Rainwater** would be collected throughout the year and used as needed and according to the time of year. By studying the number of olive trees, rainfall, watering and surface area, a calculation was made of how large a cistern is needed—that is, how large the surface of the roof should be in order to collect enough water.

By avoiding large digging due to the rocky soil, instead of creating 1 large underground cistern, the function of the cistern and the load-bearing structure of the roof are combined. 56 cisterns are shaped like funnels, connected to each other and to the underground main. Together, they function as connected vessels, so that their water level is always the same. The circular connection of the cisterns marks the space, and only their arrangement creates an invisible border. With such formations, different surfaces were obtained in relation to the different numbers of cisterns. They can be connected to each other in 2 ways: via one cistern or via two. By joining the formations with one tank, the resulting spaces are rejected, each one functions independently. By connecting the formations through **2 tanks**, the spaces begin to connect more and act as a whole. The combination of formations of different surfaces and the number of cisterns resulted in a structure of space that was porous like a sponge, similar in appearance to Pag lace. According to the geometry of the cisterns, the geometry of the funnel roof is divided. A **Voronoi diagram** is a division of a plane into areas according to a given set of objects. In the simplest case, objects are points in the plane called seeds. For each seed, a corresponding region, called a Voronoi cell, is obtained, consisting of all points of the plane closer to that seed than to any other. By applying the Voronoi diagram to the cisterns, the division of the roof was obtained.

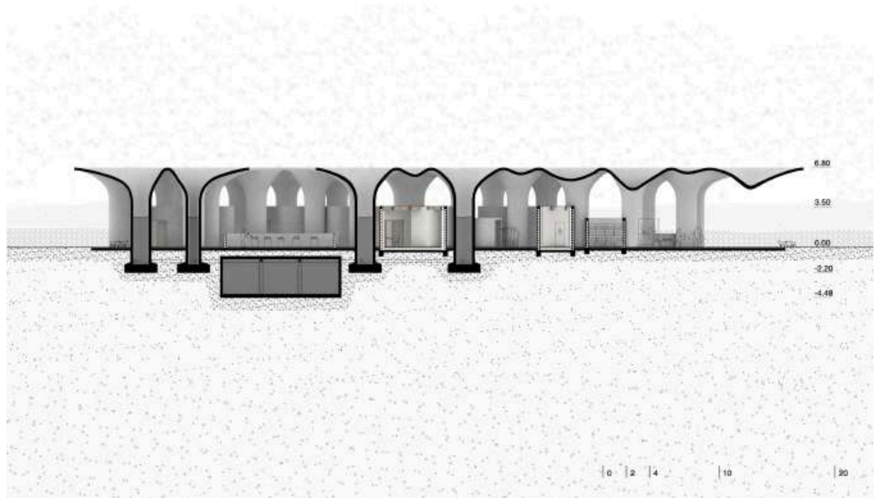
A roof with columns, like a canopy, covers the space and becomes permanent architecture. What happens inside the volume is subject to change over time. The main structure is the frame that remains, regardless of whether there is a need for space below. In the current organization of the space, which can be divided into education, production and tourism, the use throughout the year is set periodically. Each of the groups can function separately or simultaneously. The architecture placed here must not overshadow the olives; it must only contribute to their magnificence and be in an equal relationship with the 3 main actors: **the olive, the man and the sheep**. It is conceived as a content that completes and keeps the olive grove alive, and the spatial relationship served is the relationship between the olive grove and architecture. At first thought an industrial house, the house of water is actually a hypostyle silo hall. When the amount of water is limited and the soil is erosive, the best irrigation system is the drip system, i.e., drop by drop. A thin tangle of tubes emerges from the massive water-filled sponge, like a spider's web attached to a stone. A ring is placed around each olive, which has several circular openings through which water drips. Coincidence or not, the feature of the circular stacking of tanks and circular openings on the ring of the drip system behaves like a fractal, using the same principle of large and small scale.



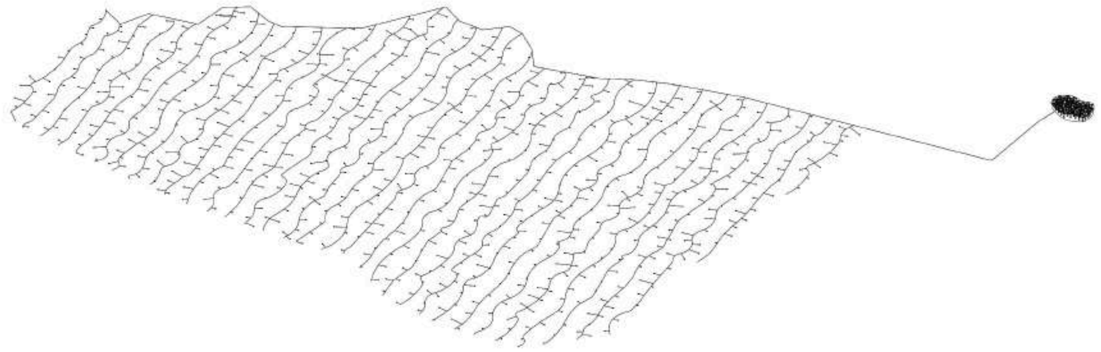
site plan



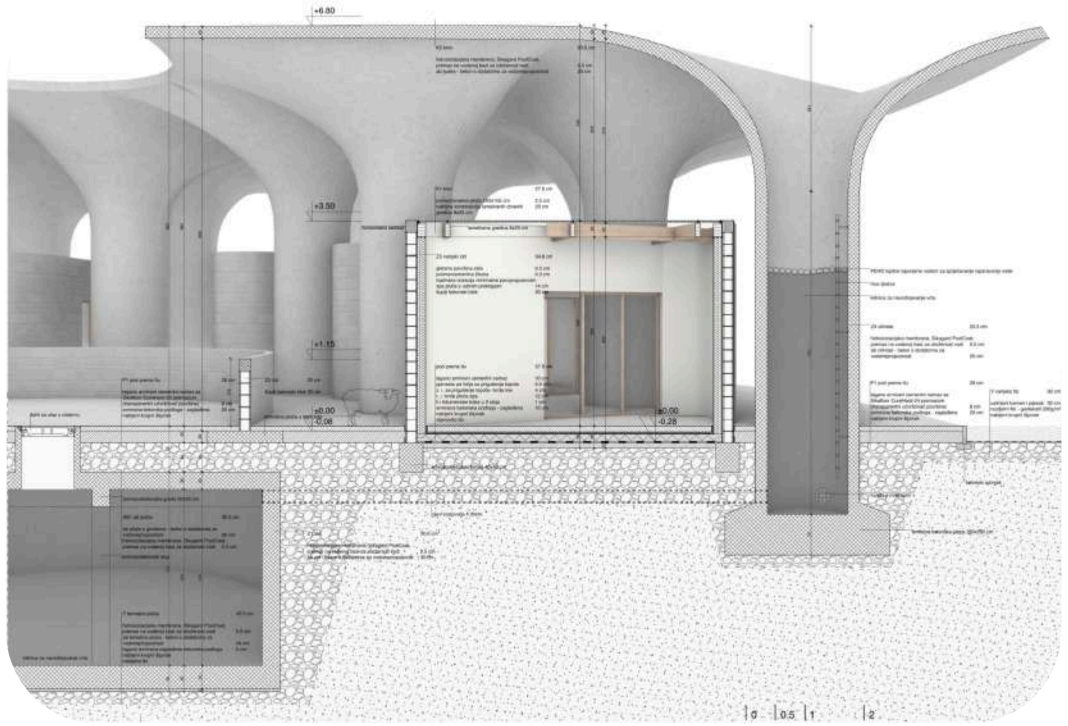
ground floor plan



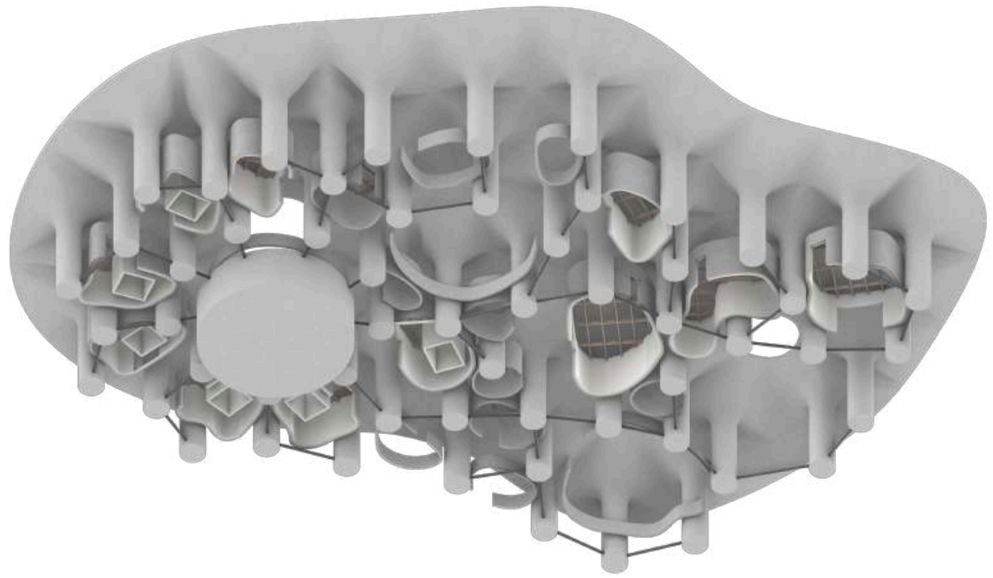
section a-a



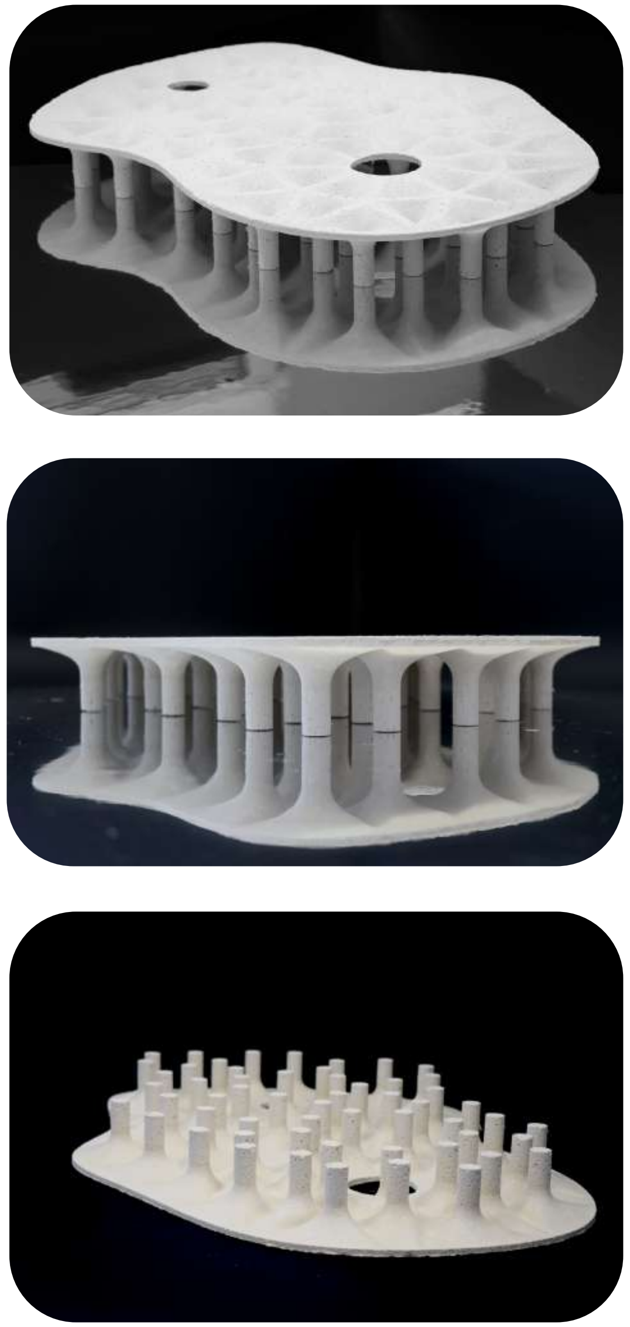
irrigation system



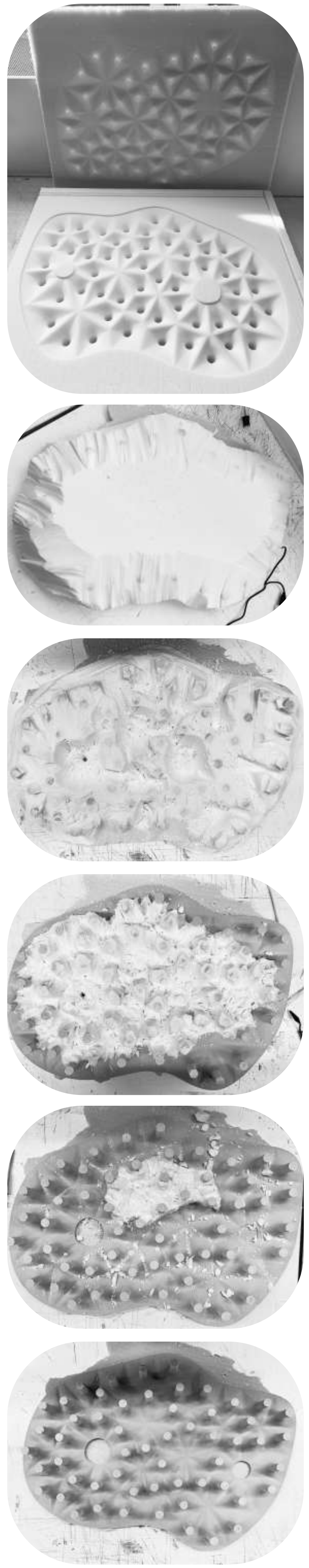
construction drawing



view from below



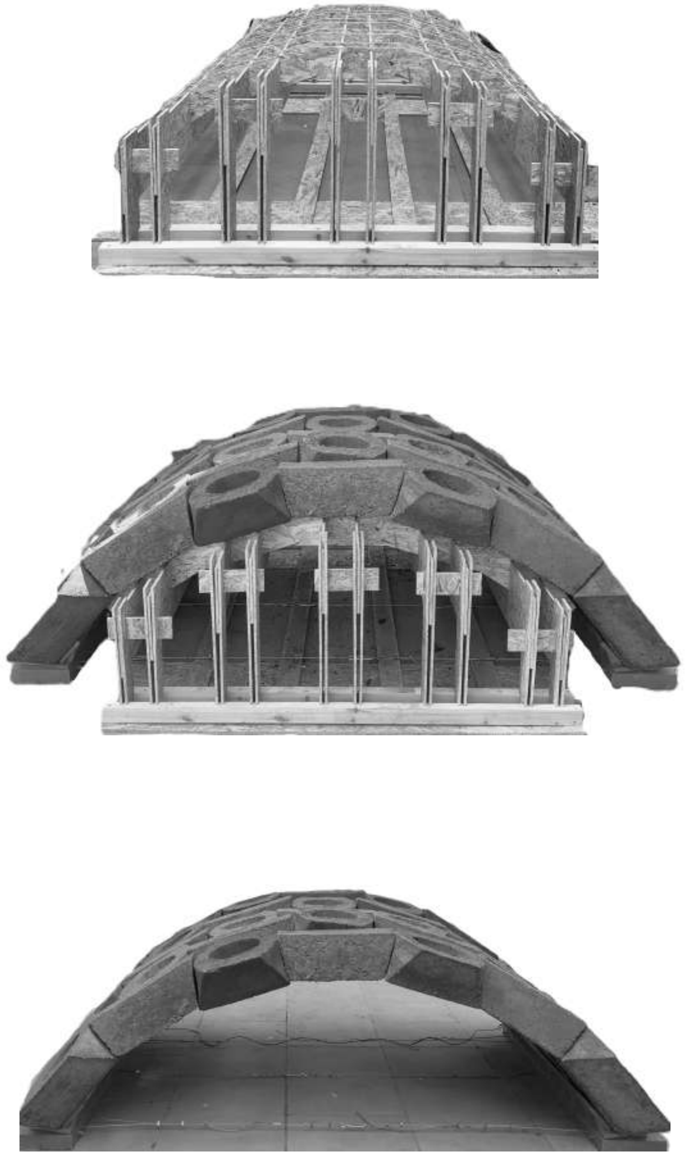
Olive grove architectonics model



cnc cutting: Hrvoje Spudić
location: island of Pag, Lun, Croatia
academic year: 2022/23

https://www.arhitekt.hr/hr/radovi/rad/arhitektonika-maslinika,480.html
materials used: xps boards, gypsum, water, matte white spray, reflective foil

The model made for the graduation workshop is a combination of machine and manual modeling. 2 **xps** molds were cut on a **cnc machine**. The first mold serves as a container into which **plaster** is poured, while the second, the lid, creates the roof topography and closes the model. After drying the **gypsum** in the molds, the xps is removed mechanically and only the organic structure remains. The structure is placed on a stand on which a **reflective foil** is glued, which enables greater visibility of the shell structure.



Morpholock, AA Dlab

programme head: Dr Milad Showkatbakhsh

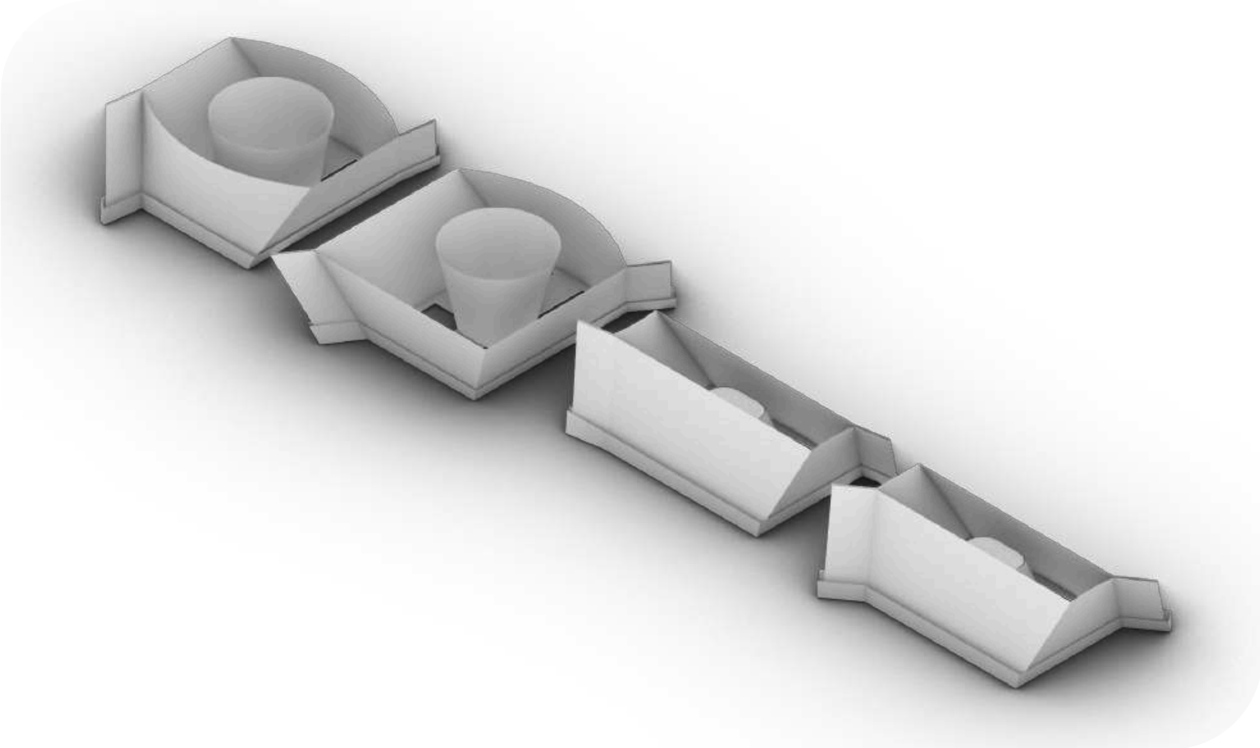
tutors: Dr. Milad Showkatbakhsh, Alexander Krolak, Angel Fernando Lara Moreira, Jonathan Wong, Giulio Gianni

co-authors: Yuliya Leberfarb, Marina Osmolovska, Jingping Wu, D. Blayney Garces, Kentaro Hayashi, Jatan Paresh Gada, Umut Ekin Ozyurt, Mauricio Diaz Valdez, Elizabeth Frias Martinez, Matea Pinjusic, Farah Swilam, Hasibe Cepni Tiefenthaler, Roti Akinyelu, Antonio Moll Moliner

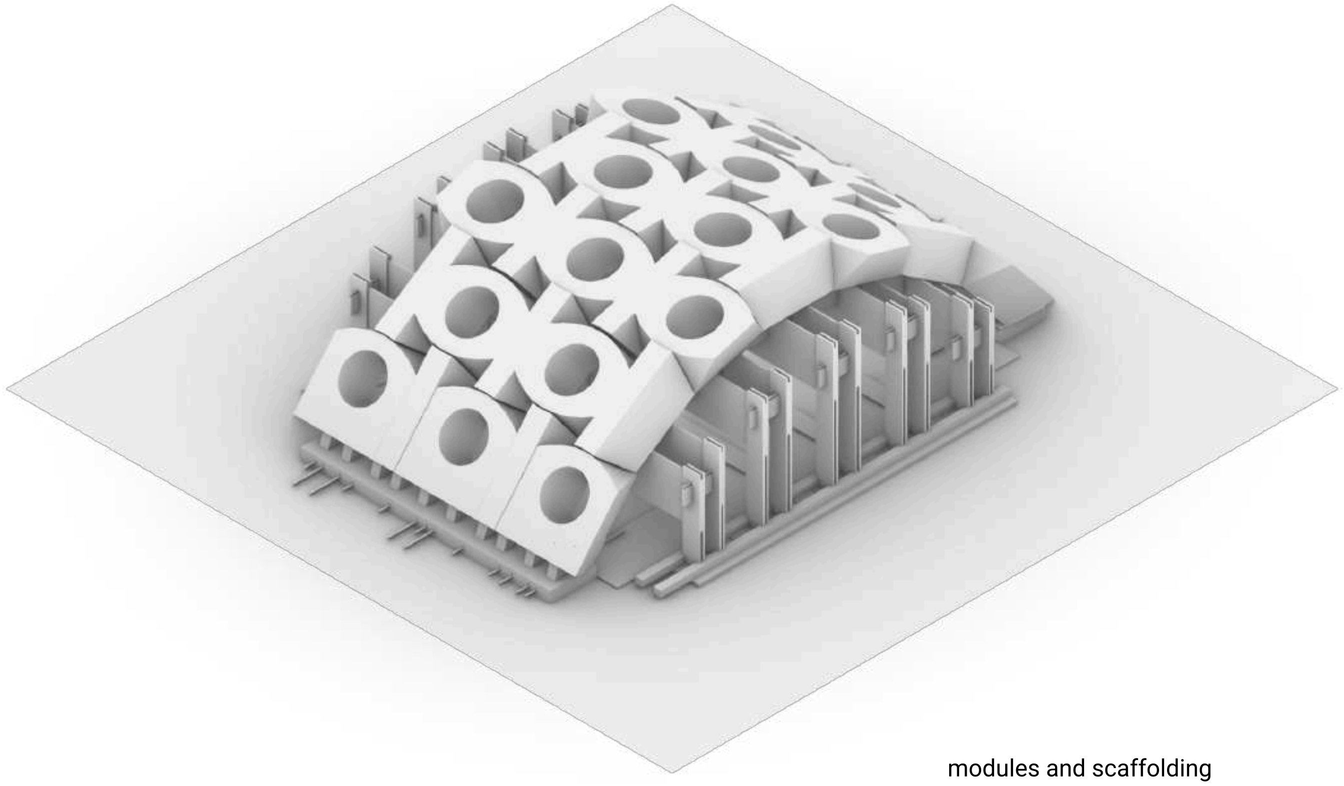
year: 2025

https://dlab.aaschool.ac.uk/programme/
materials used: 3D-printed formworks, lightweight concrete, timber, steel cables

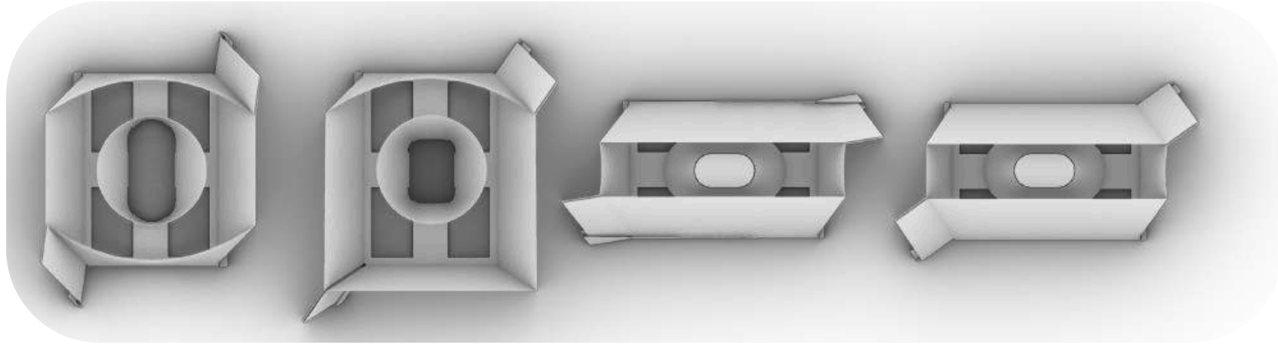
This year's DLAB launched a research stream on **Topological Interlocking Assemblies (TIAs)** through the design and construction of a full-scale structure at the AA London. Using lightweight concrete blocks cast in reusable **3D-printed formworks**, the project explored TIAs' geometry-based interlocking, which offers exceptional energy absorption, crack resistance, and efficient load transfer in quasi-brittle materials like concrete. Their modular, **binder-free design** enables material efficiency and reusability, supported by **robotic fabrication** to produce complex geometries with minimal waste. The research combined rigorous digital simulation with iterative physical prototyping, culminating in a topologically interlocking vault. Formworks were 3D-printed using @ai_build **Ai Build's** advanced software, enabling precise, sustainable, and economically viable construction.

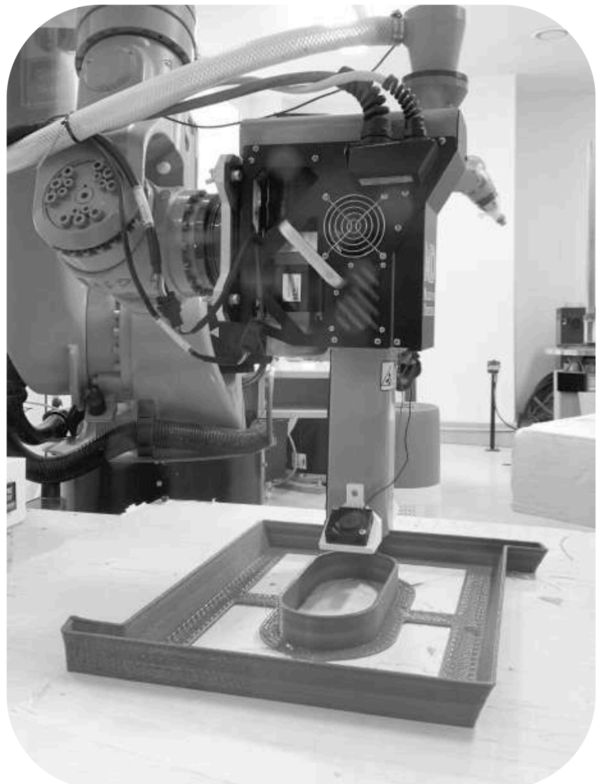


formworks models

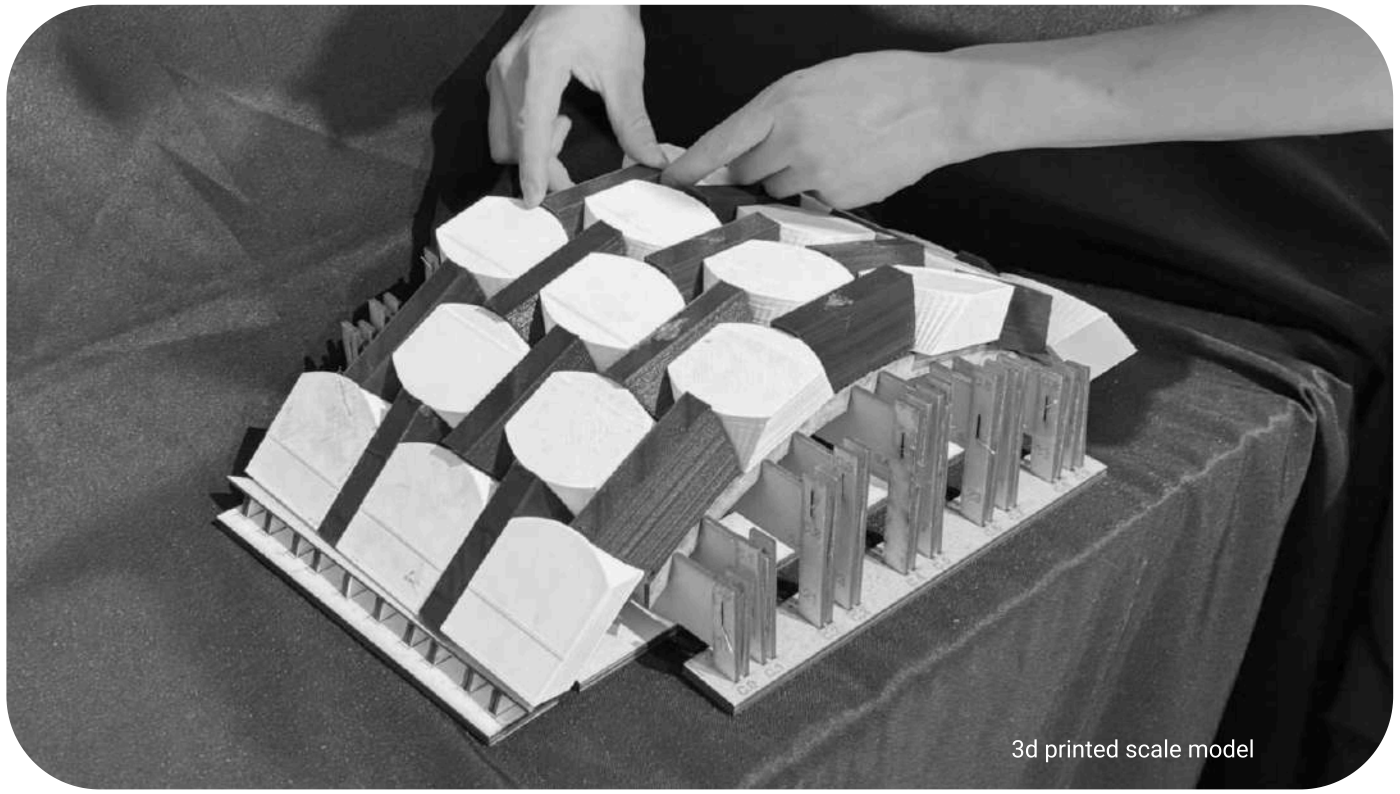


modules and scaffolding

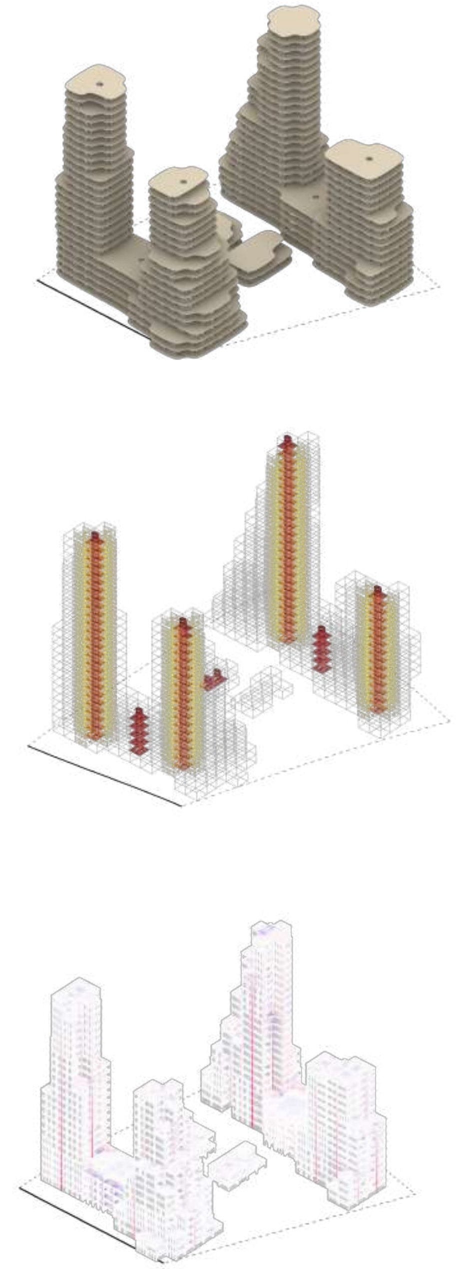




robotic fabrication



3d printed scale model



Parasyte, Growing exisiting structure

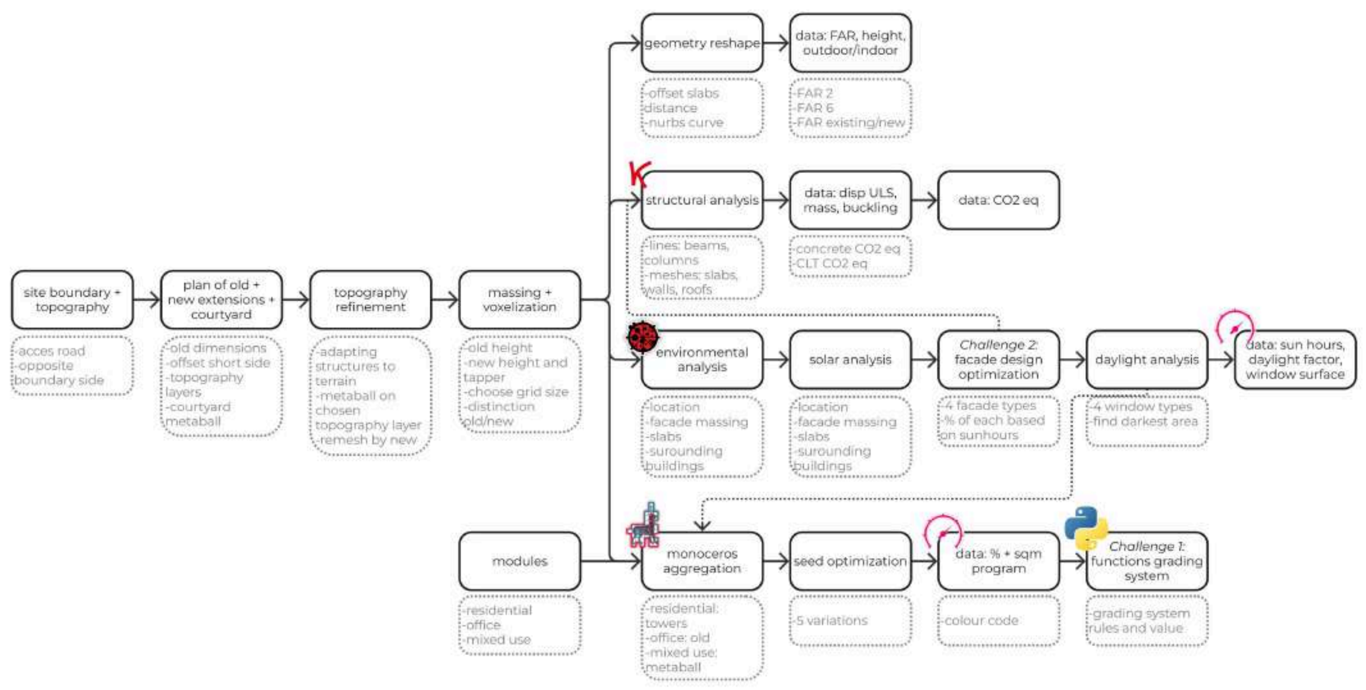
mentor: David Andres Leon, Lucia Leva Fuentes
co-authors: Aymeric Brouez, Francesco Visconti Prasca, Lennart Hamm
academic year: 2024/25

https://blog.iaac.net/parasyte-growing-exisiting-structure/
programmes used: rhino, grasshopper, comfyui

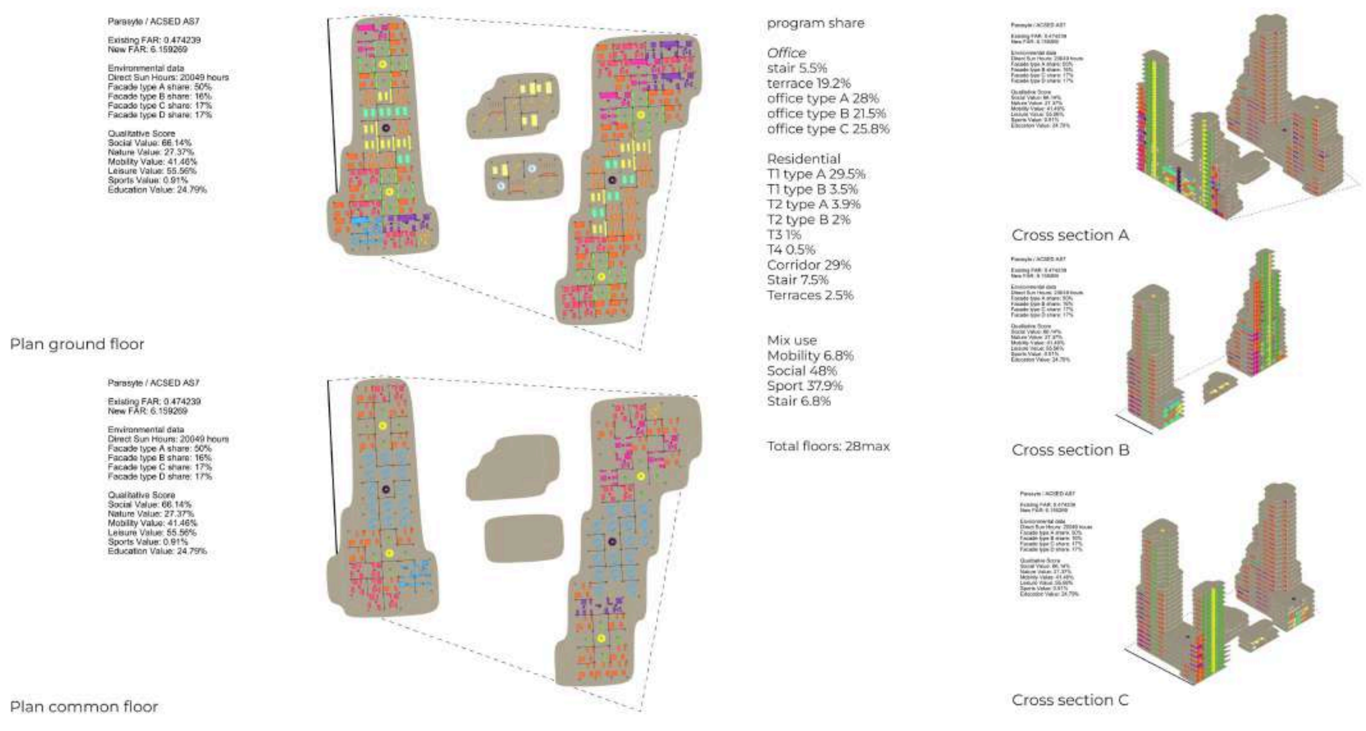
We approached our parametric project with a **top-down methodology**, emphasizing the importance of urban, climatic, social, and economic parameters. These factors, alongside the needs for project development, are crucial when discussing architecture that focuses on the **reuse and recycling** of existing structures in both established and developing contexts.
The algorithm is initiated on a designated plot with a defined access road, but the flexible script can adapt to any location. Starting with the premise of working on existing buildings, typically characterized by regular reinforced concrete structures common in outdated residential or commercial buildings in Europe, we implemented horizontal and vertical expansions. This approach introduces service areas around the existing structure.
Sunlight as an environmental parameter is used to optimize heights and vary facades, incorporating terraces and green roofs. The old structures house administrative functions, while the new additions are dedicated to residential purposes, the towers, and various services within the plot. The workflow is divided into preprocessing steps, building generation, and post-process data outputs for evaluation. Preprocessing: Extracts information about the existing structure, such as grid size and column and beam dimensions, and refines topography and massing for the new structure.
Generation: Relies on the geometrical shapes of existing and new structures and spatial demands like FAR and room height.
Postprocessing: Involves structural analysis to optimize material usage and reduce displacements and stiffness, and environmental analysis to optimize sunlight access. Automatically adjusting window sizes based on solar radiation analysis, using a distribution of four different facade modules. The spatial arrangement is governed by a topological map, which defines the connections between modules based on adjacency requirements and functional relationships. This ensures that each configuration aligns with **programmatic needs** while maintaining logical and efficient spatial flows for every generation.
For instance, circulation modules act as connectors, strategically linking residential and office spaces to shared amenities and services. At the heart of this project lies a sophisticated implementation of the Wave Function Collapse (WFC) algorithm, adapted to generate contextually responsive floorplans. The process begins with a catalog of modules, categorized by function—**residential, office, social, services, circulation,** and more. These modules serve as the building blocks for the design, allowing for high adaptability and a modular approach. The modular system is further enhanced by its parametric flexibility. Modules are designed to adapt to changes in grid size, with all proportions and dimensions dynamically parameterized. This adaptability allows the design to respond seamlessly to site-specific constraints, such as varying plot sizes or urban densities, ensuring that the generated solutions remain scalable and context-sensitive. This WFC-based approach is a key component of the broader generative design workflow. The script iterates through multiple design options, automatically analyzing metrics such as structural **efficiency, carbon footprint, and spatial performance**. With live feedback, each iteration refines the design to achieve an optimal balance of sustainability, functionality, and aesthetic quality. Performance data, including environmental metrics, spatial efficiency, and assigned qualitative performance attributes, are continuously updated in real time, providing immediate feedback. These attributes align with our group challenge to integrate both measurable outputs and design quality. This iterative approach ensures that each design balances contextual responsiveness with sustainability and functional performance.

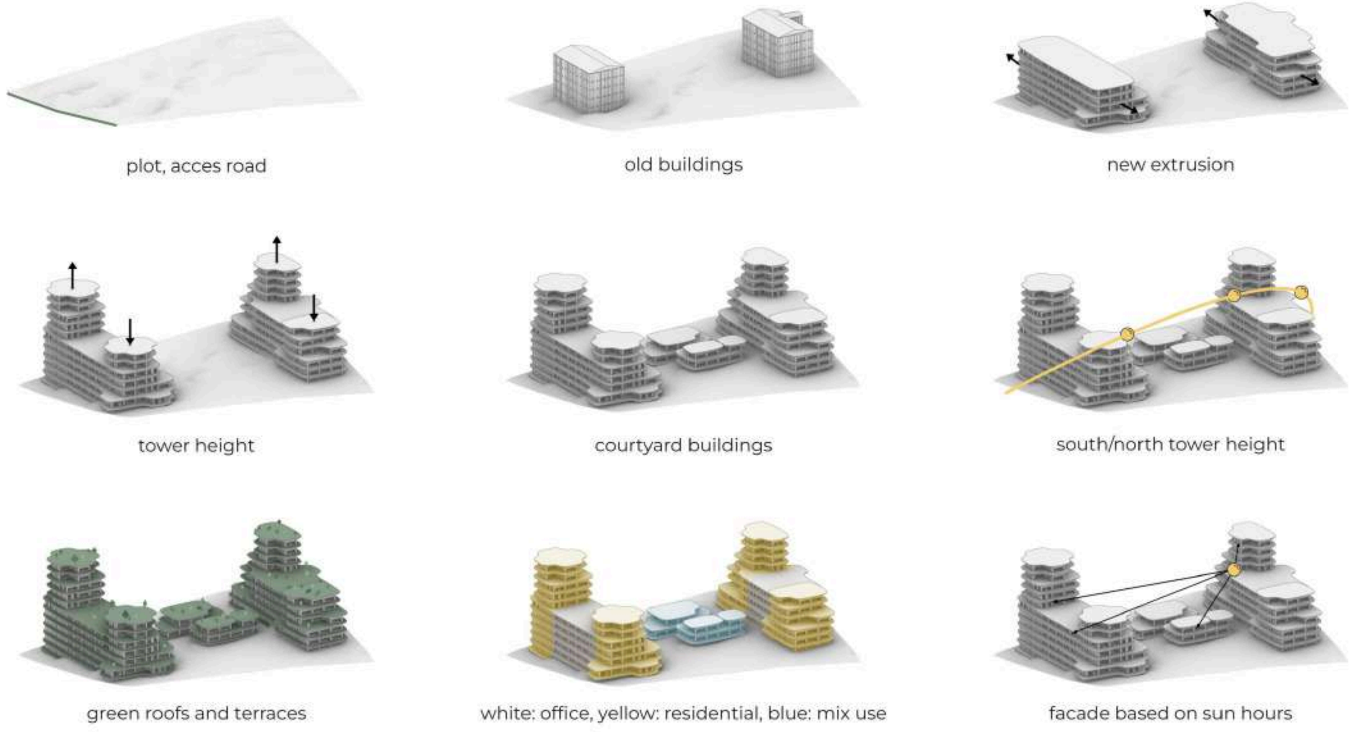
Key metrics include:
FAR (Floor Area Ratio): Detailed calculations with variations.
Program Ratio & Percentage: Clear allocation of spaces.
Qualitative Assessments: Addressing usability and design quality.
Structure: Evaluation with Karamba.
Environmental Data: Solar analysis and facade types.
Timing of the script.

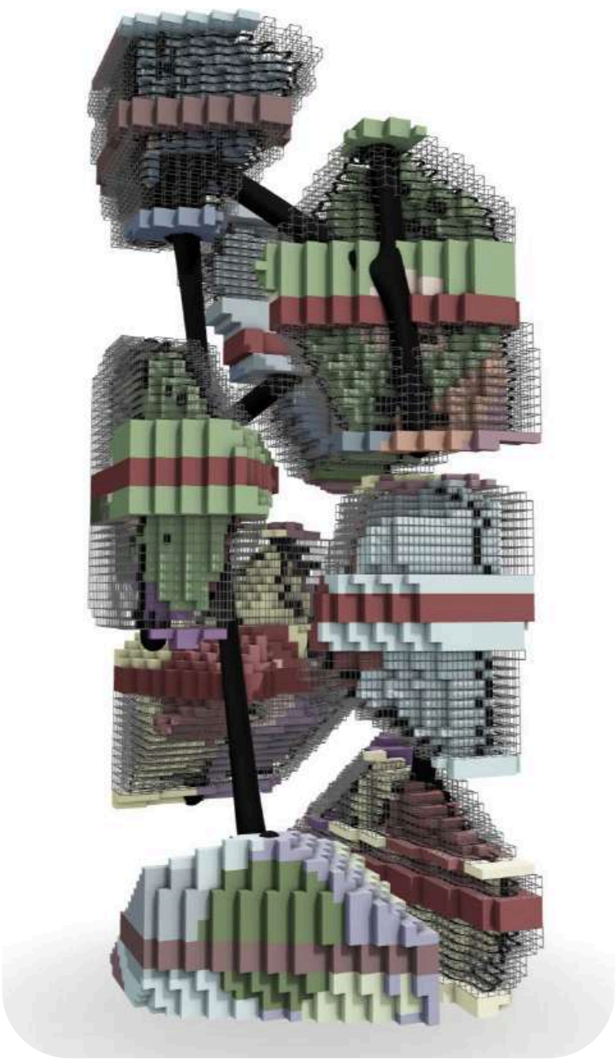
By combining advanced **computational techniques with architectural expertise**, this project exemplifies how generative design can push the boundaries of traditional workflows. It not only accelerates the design process but also ensures that the outputs are environmentally and contextually aligned. The integration of algorithms like Wave Function Collapse demonstrates the potential of computational design to create adaptive, high-performance architecture—bridging the gap between data-driven processes and human-centric design.



pseudo-diagram







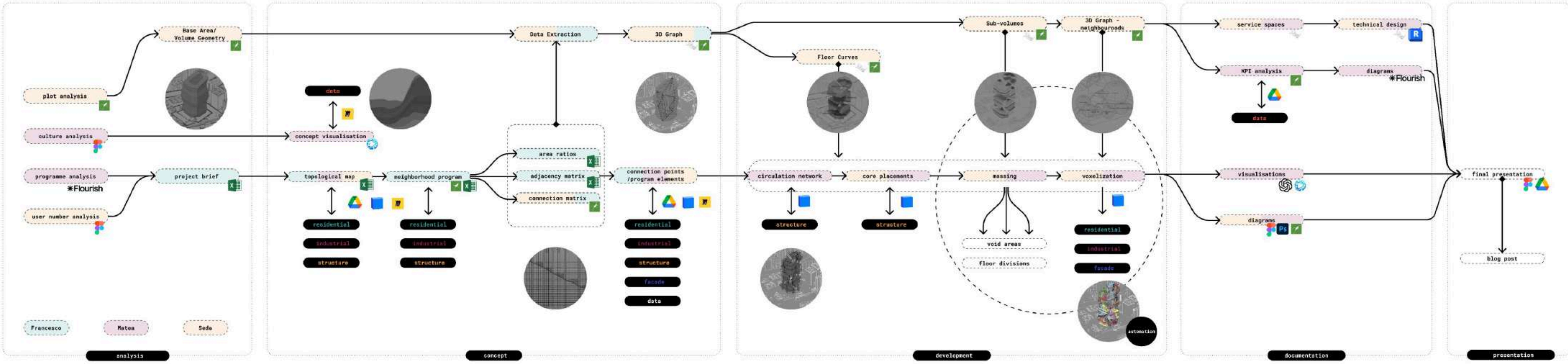
Ensō Hyperbuilding, Services

mentor: Cristóbal Ignacio Burgos Sanhueza, Pablo Antuña Molina, João M. Silva
co-authors: Seda Soylu
academic year: 2024/25

https://blog.iaac.net/enso-hyperbuilding-services/
programmes used: rhino, grasshopper, comfyui, speckle

The Hyper-Building is designed as a self-sustaining urban structure, operating **24/7** with adaptable spaces that transform based on residents' needs. It consists of **eight interconnected neighborhoods**, each programmed for flexibility, allowing functions to shift throughout the day. A key metric in our approach was occupancy efficiency, ensuring that spaces are utilized optimally across different time periods.
Spatial distribution was managed using **macro and micro adjacency matrices**, imported into Grasshopper to define program relationships. These matrices helped position functions based on adjacency constraints, orientation, and area requirements, ensuring an efficient organization. Our team primarily processed program data, massing inputs, circulation strategies, and **voxelized representations**, providing structured data to inform the overall design.

Allocation was determined through automated workflows, integrating **Python scripts**, adjacency matrices, and parametric logic. Residential spaces were assigned to facades for better light and air access, while service and industrial functions occupied central zones. Circulation was structured around core connections, efficiently linking neighborhoods and functional areas.
Voxelization played a crucial role in organizing the building. This process was fully automated using **SpecklePy and Fly**, allowing real-time data exchange between teams. Points were converted into structured voxels, sorted and assigned based on area needs. From slab curves, corridors and vertical cores were extracted, ensuring logical circulation and accessibility. A floor-by-floor analysis maintained consistency, with color-coded functions appearing in similar locations across neighborhoods.
This project combines **automation, adjacency mapping, and parametric design** to create an adaptive urban system. Spaces are highly flexible, responding dynamically to user demand while maintaining an efficient and structured organization. The Hyper-Building demonstrates how data-driven workflows can redefine architecture, enabling cities to function as living, responsive environments.



pseudo-diagram and collaboration worfklow

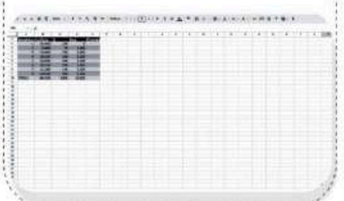
09
KEY POINTS

Hyper A is a visionary vertical ecosystem that redefines the idea of **a 24/7 "city within a city"** through a seamless fusion of **computation and human-scale** design. Spanning a 1 km² hyper-building divided into **eight distinct neighborhoods**, the concept uses 3D space syntax and Kangaroo solver to optimize **connectivity, adjacency, and functionality** at both macro and micro scales. At its core, Hyper A prioritizes community life—interweaving neighborhoods into **a dynamic social network where space is fluid, adaptable, and engaging**. A **voxelized workflow** supports precision collaboration across teams, while innovative circulation systems ensure **experiential richness**.

Here, movement becomes an experience, and architecture becomes infrastructure for interaction.

data

+ collaboration with other teams
+ research for population & benchmark
+ eight neighborhoods concept
+ detailed program - day/evening/night
+ utilization rate for KPI

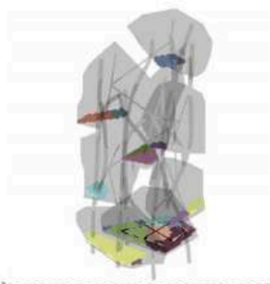


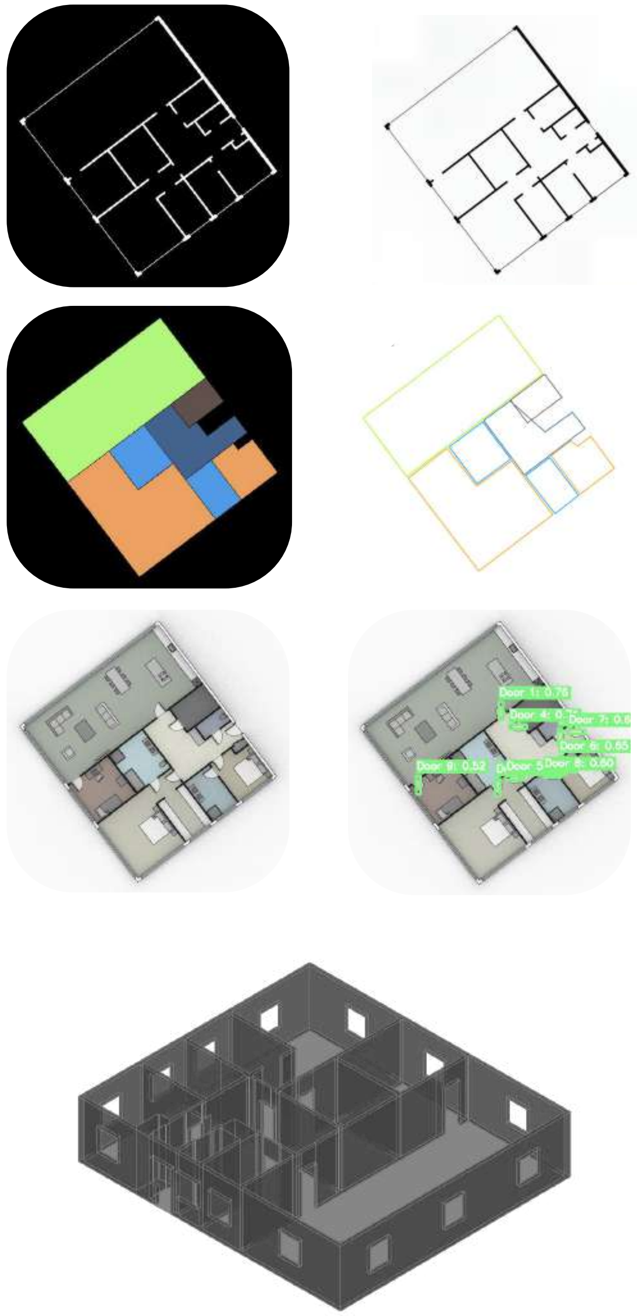
allocation

+ massing study in collaboration with structure team
+ macro and micro adjacency
+ kangaroo solver
+ data gathering and extraction for function distribution

voxelization

+ automated process
+ color coded functions
+ corridor placement
+ area calculation for KPI





Dataset: Image to 3d

part of IAAC thesis research (not published yet)
mentor: Angelos Chronis
co-authors: Marco Durand, Joaquín Broquedis
academic year: 2024/25

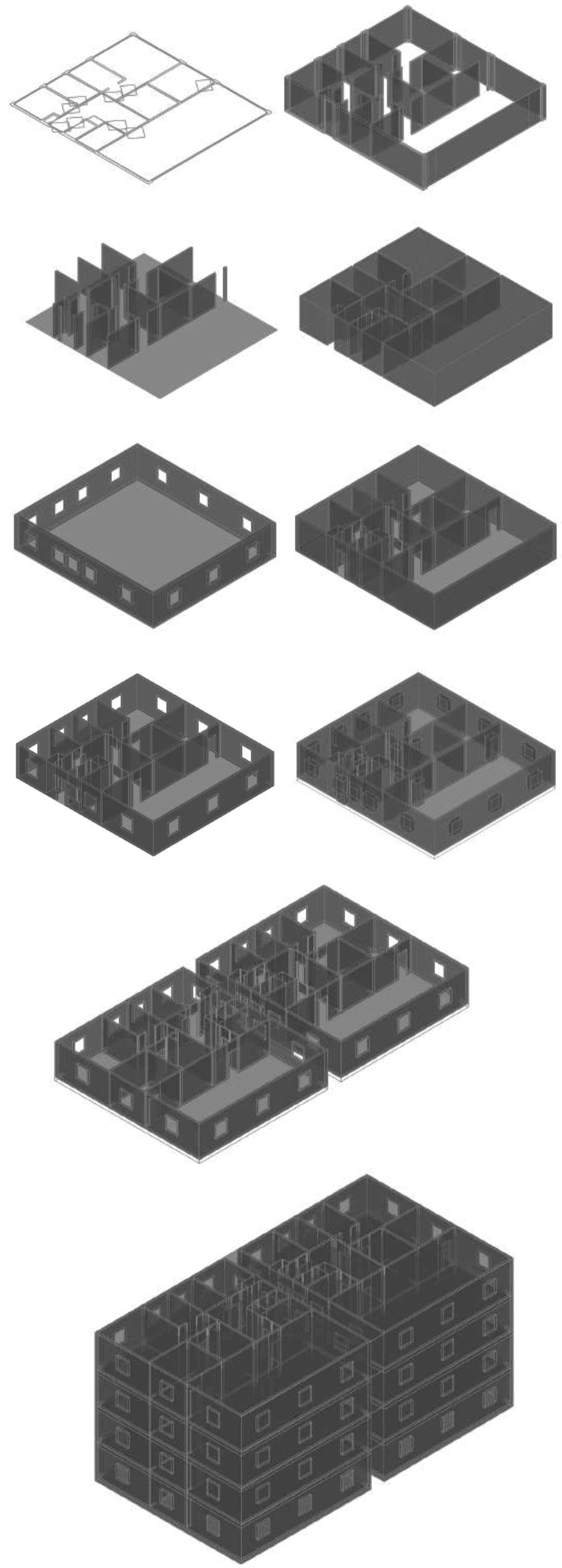
used dataset: https://huggingface.co/datasets/zimhe/pseudo-floor-plan-12k
models used and implemented in VS code:
https://github.com/zsyOAOA/InvSR
https://huggingface.co/spaces/weepakistan/Vectorizer-AI,
https://universe.roboflow.com/testing-daidy/floor-plan-walls/model/5

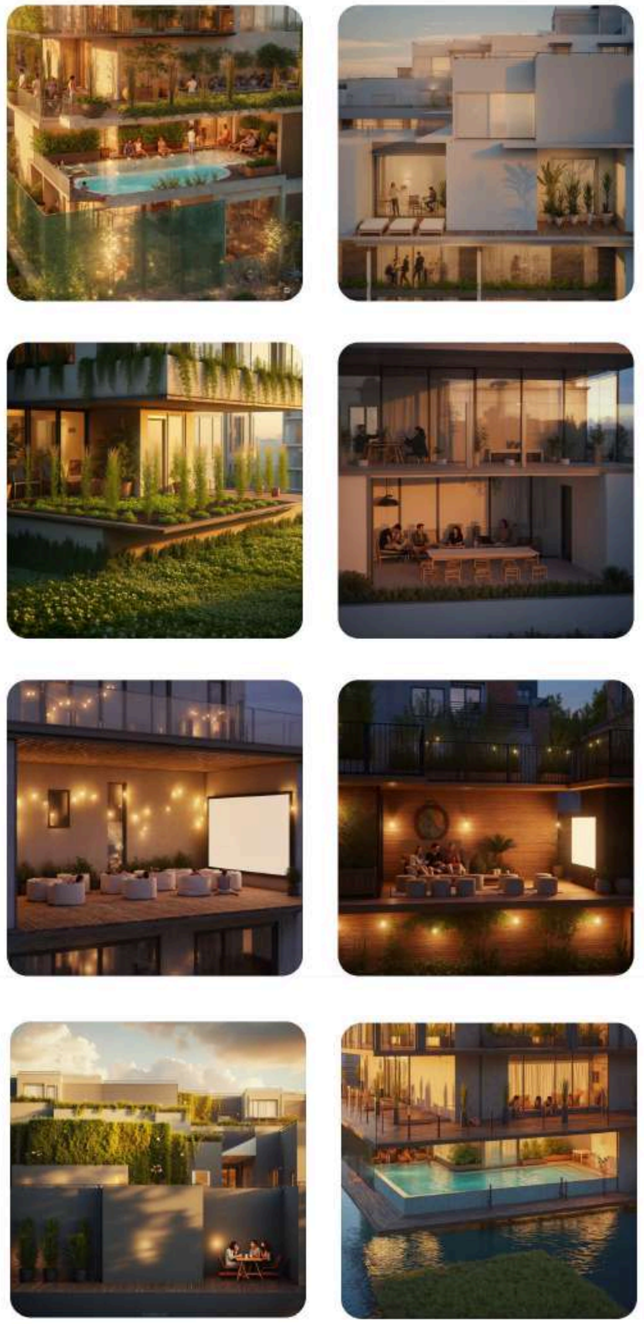
programmes used: rhino, grasshopper, python, VS code

This section presents one part of the ongoing IAAC thesis research, which is focused on developing an **ML-ready dataset** for architectural applications. Specifically, this part of the workflow investigates how open-source floorplan **image datasets can be transformed** into 3D, IFC, and graph-compatible formats.
The process begins with a dataset of floorplan images originally prepared for **pix2pix training**. From each sample, three key input images are used:

1. **Wall Geometry (Black-and-White Image):**
   The original wall drawings are processed by inverting image channels and running a vectorization script that converts the raster input into an SVG representation of wall geometry.
2. **Room Typology Image:**
   This image provides the spatial categorization of rooms. The script extracts outlines of different functional areas, which are later assigned to specific space types.
3. **Floorplan Image with Openings:**
   Using computer vision techniques, door positions are detected directly from the floorplan, providing additional input for the building's spatial logic.

All three inputs are then imported into **Grasshopper**, where a custom script simplifies the vector data and categorizes it into distinct architectural elements: spaces, interior walls, exterior walls, windows, and doors. Based on these categories, a **simplified building model** is generated.
While this represents only one part of the pipeline, it is designed to integrate with the broader thesis framework, which includes environmental and energy simulations, context integration, graph database creation, and CSV-based data structuring. Together, these components aim to build a **robust pipeline** for translating 2D floorplan datasets into structured, semantically rich, and **simulation-ready 3D building models**.





AI-Powered Community Spaces

mentor: João M. Silva, Erida Bendo
co-authors: Seda Soylu
academic year: 2024/25

https://blog.iaac.net/ai-powered-community-spaces-where-architecture-meets-democracy/
https://youtu.be/lYYvHs4z04I
programmes used: rhino, grasshopper, comfyui, python, VS code

Problem Statement: Too Many Opinions, Too Few Spaces
Imagine living in a residential complex with beautiful outdoor terraces, courtyards, and balconies. Now imagine 50+ residents, each with different ideas about how these spaces should be used. Should the rooftop be a quiet meditation garden or a vibrant community BBQ area? Should the courtyard host children's playgrounds or adult fitness equipment?
Traditional approaches to this problem typically involve either:

+Top-down decisions by building management often unpopular
+Endless committee meetings that rarely reach consensus
+First-come-first-served allocation which favours the loudest voices

Solution: the Co-creator App

The app is our answer to smart systems for adaptive living and building community values. We use a building generator as a initial database to analyze shared open spaces between apartments, combining geometry and simulation. We also use climate and environmental data from Barcelona. Three machine learning models help predict activity, green suitability, and usability. Large Language Model interprets user requests and turns them into design actions.

+Building Generator to **analyze shared open spaces** between apartments geometry and simulation
+Barcelona to analyze **climate and environmental data**
+**3 ML models** to predict Activity, Green suitability and usability
+**LLM-based** reasoning to interpret user requests

Upon launching the application, users are presented with a **PyQt5-based** interface that opens on a welcome tab. The backend establishes live connections with both the Grasshopper file (for real-time geometric computation) and external data sources, including structured **CSV files and a SQLite database.**

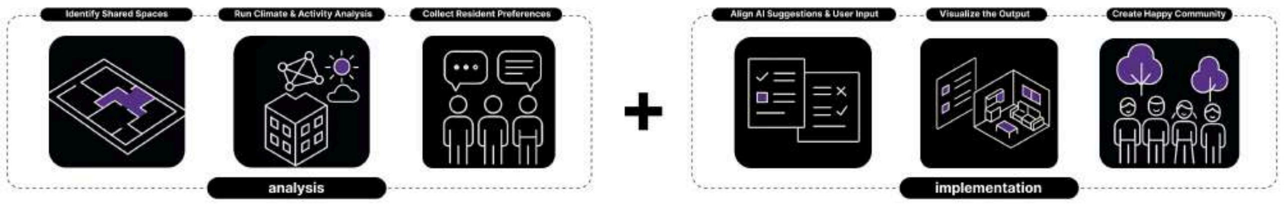
Once the user completes the onboarding survey, their responses are stored in **the personas_assigned table**, forming the basis for downstream personalization. Concurrently, the system initiates several background processes: it constructs the SQL-ready database schema, executes **pre-trained machine learning models** for initial activity prediction, and computes resident-specific voting weights. These weights are critical inputs for **the multi-agent negotiation engine.**

For general user queries, a **router.py** module classifies each request based on intent—distinguishing between data-driven (SQL or CSV-based) and **knowledge-based queries....** Embedded contextual knowledge includes localized content on **climate, co-living practices, and the socio-urban fabric of Barcelona.** Users can freely explore both the architectural model and its associated spatial datasets while querying the system.

Activity recommendations for each space are generated by a reasoning engine that integrates multiple layers of data: geometric and environmental inputs from Grasshopper, suitability class mappings, and weighted preferences from user personas. The engine synthesizes these factors to assign the most contextually appropriate activity per space.

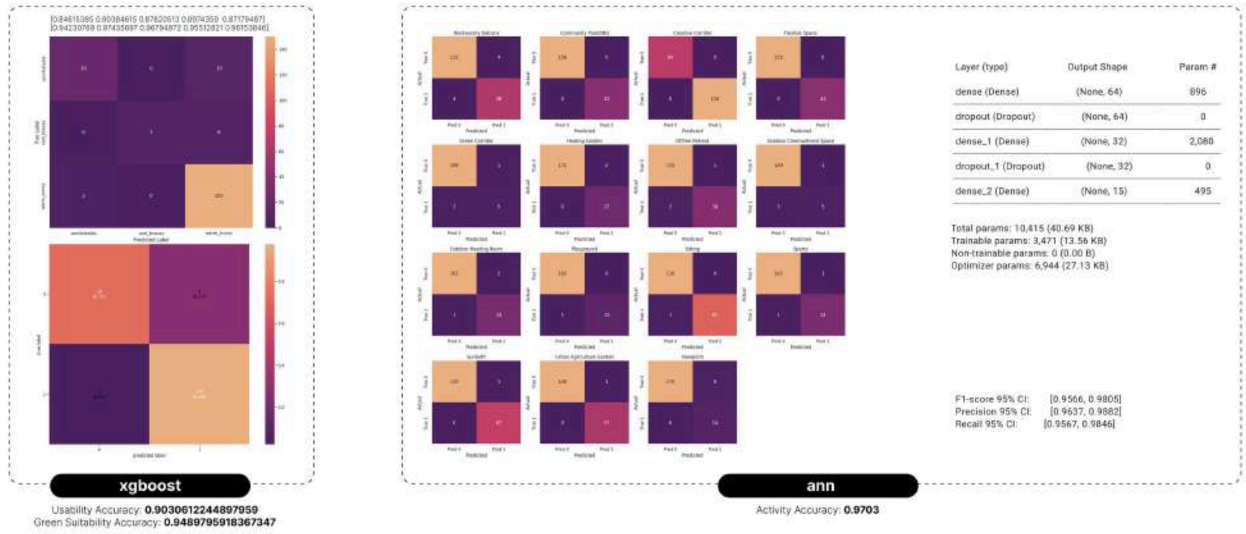
During negotiation phases, user queries are routed through a suggestion system that performs **multi-level validations**, including cross-referencing resident profiles, spatial proximities, and programmatic constraints. A local LLM interprets these inputs and proposes viable actions, often involving **comparative reasoning across alternatives.**

If the suggestion implies **a geometric modification,** the system issues update commands to Grasshopper for 3D model alterations. . Upon finalizing the proposal, a screenshot of the relevant outdoor space is generated and sent to ComfyUI, accompanied by the necessary prompts for visual post-processing using a style-specific LoRA or ControlNet workflow.

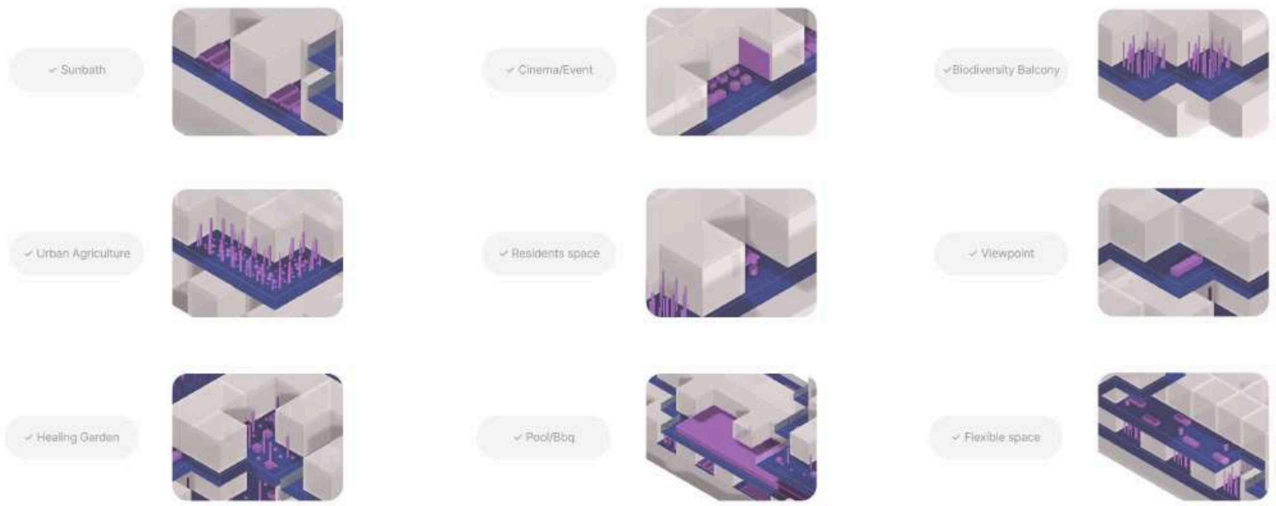


ML Prediction Models

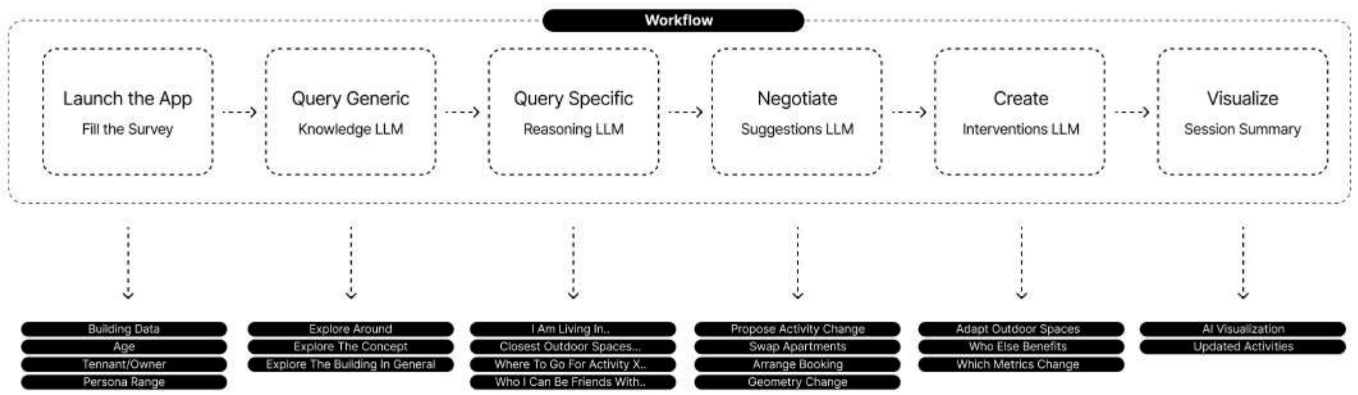
To predict green suitability, comfort usability, and appropriate activities, both shallow and deep learning models were trained on a dataset combining geometric features (e.g. compactness, longest edge, open sides) and environmental data (e.g. sun hours, wind exposure, UTCI), along with rule-based classifications.❶ The multi-class, multi-label deep learning model outperformed the two shallow models, which were limited to single-class predictions.❷

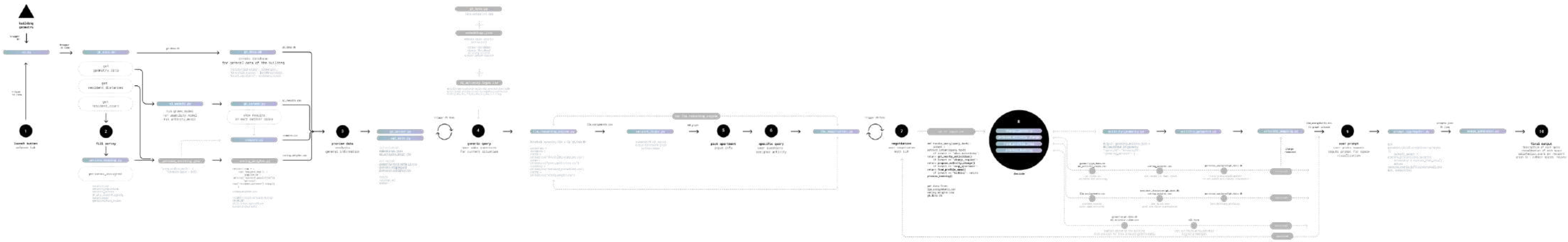


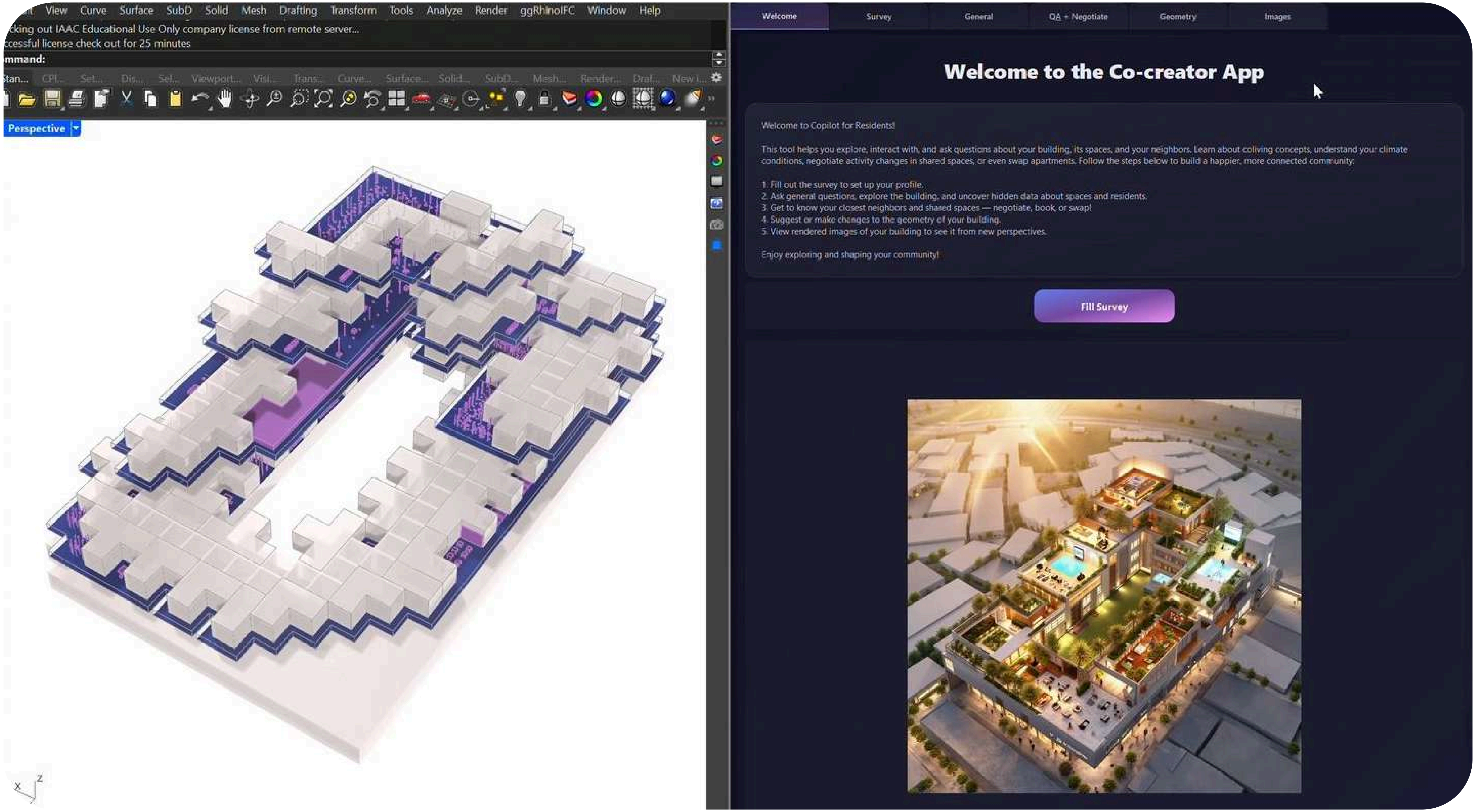
machine learning implementation

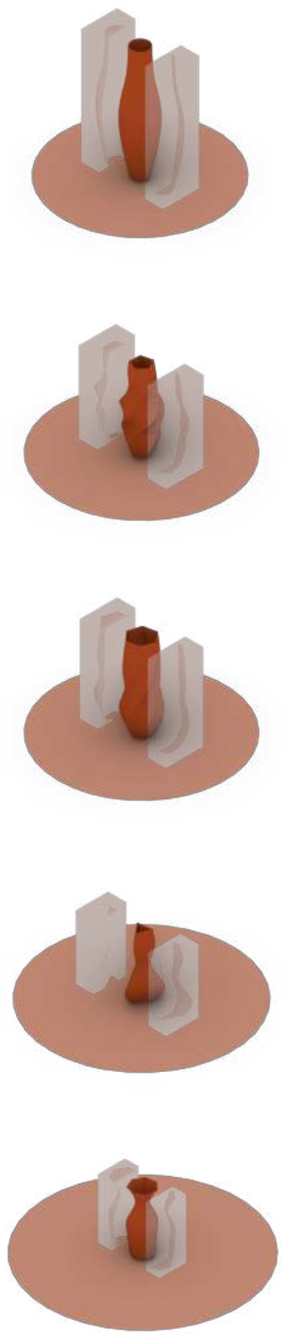


possible space typology






View Curve Surface SubD Solid Mesh Drafting Transform Tools Analyze Render ggRhinoIFC Window Help
cking out IAAC Educational Use Only company license from remote server...
ccessful license check out for 25 minutes
mmand:
Perspective
Welcome
Survey
General
QA + Negotiate
Geometry
Images
Welcome to the Co-creator App
Welcome to Copilot for Residents!
This tool helps you explore, interact with, and ask questions about your building, its spaces, and your neighbors. Learn about coliving concepts, understand your climate conditions, negotiate activity changes in shared spaces, or even swap apartments. Follow the steps below to build a happier, more connected community:
1. Fill out the survey to set up your profile.
2. Ask general questions, explore the building, and uncover hidden data about spaces and residents.
3. Get to know your closest neighbors and shared spaces — negotiate, book, or swap!
4. Suggest or make changes to the geometry of your building.
5. View rendered images of your building to see it from new perspectives.
Enjoy exploring and shaping your community!
Fill Survey



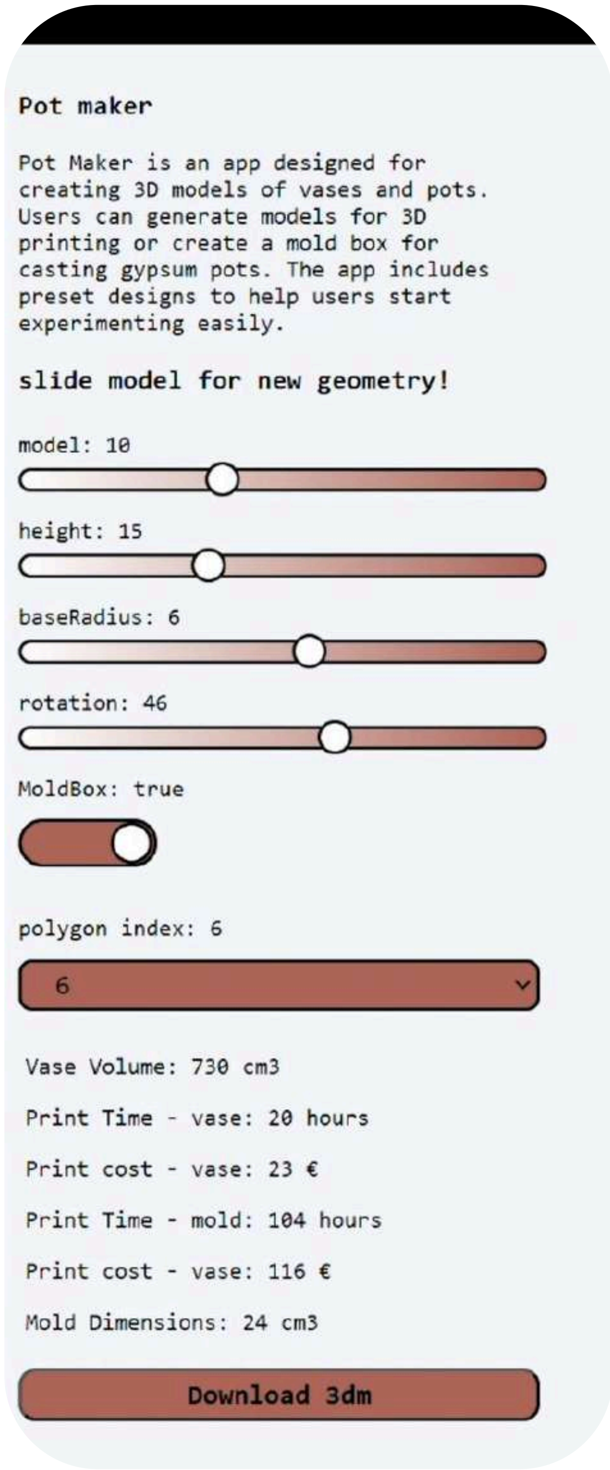
Pot maker

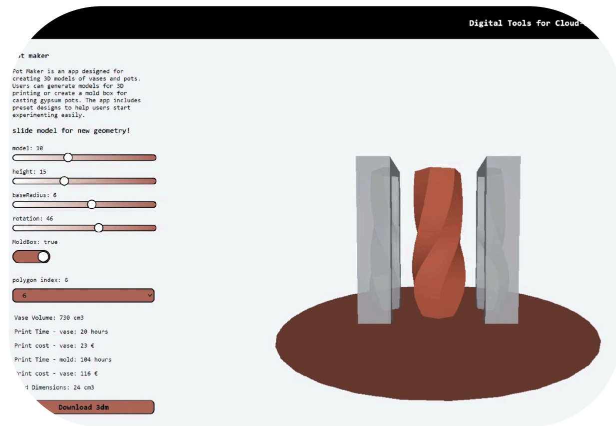
mentor: David Andres Leon, Justyna Szychowska
academic year: 2024/25

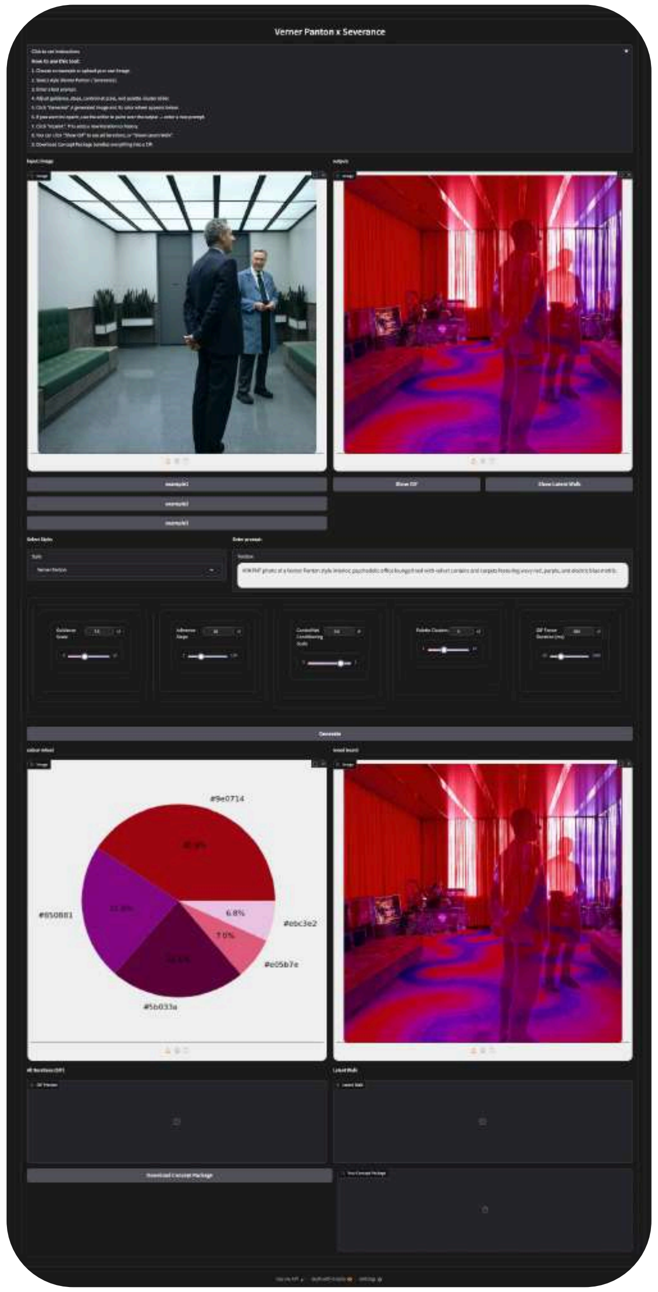
https://blog.iaac.net/pot-maker/
programmes used: rhino, grasshopper, rhino compute, js, VS code, three.js

Pot Maker is an app designed for creating **3D models of vases and pots**. Users can generate models for 3D printing or create a mold box for casting **gypsum pots**. The app includes pre-set designs to help users start experimenting easily. https://datamgmt25.iaac.net/
The app is intended for individuals interested in ceramics and clay who want to explore new technologies, even if they have no prior experience with 3D modelling.

Inputs user can play with:
Model type
Basic pot dimensions (height + radius)
Rotation angle
Polygon index (circular, oval, square)
Outputs:
3D model of the pot
3D model of the mold box
Metadata:
Vase Volume: X cm3
Print Time – vase: X hours
Print cost – vase: X €
Print Time – mold: X hours
Print cost – vase: X €
Mold Dimensions: X cm3







Panton vs Lumon

mentor: Nono Martínez Alonso, James McBennett, Michal Gryko
co-authors: Seda Soylu
academic year: 2024/25

https://blog.iaac.net/interior-style-assistant/
https://youtu.be/2AEUEF4uJ7U
programmes used: comfyui, python, gradio

Welcome to Panton vs Lumon, the app we built during the GenAI course to explore what happens when you pit two aesthetic extremes against each other, then hand over control to the user. Think Verner Panton meets Severance's Lumon Industries. This isn't just style transfer – it's a design identity crisis turned into a creative tool.

App runs on an image-to-image pipeline that combines the strengths of **FLUX.1, LoRA fine-tuning, ControlNet depth map, and LLM-based image analysis**(atmosphere, material use, color psychology).

Base Model : Flux.1
We prefer Flux.1 for high fidelity and realistic image capabilities over SDXL as some of our dataset images were old photographs.

Fine-tuning: LoRA
To embed our two opposing styles, we trained two separate LoRA models (~2000 steps each) using curated image datasets
Lumon– showcasing low-color brutalist interiors, cold lighting, and symmetrical office horrorscapes.
Panton – featuring iconic interiors, plastic modularity, and saturated color blocking.

ControlNet: Depth Map
To provide better alignment between input and output images, we used FLUX.1-dev-ControlNet-Union-Pro-2.0 with a depth map generated from the uploaded image. This ensures furniture and architectural structure stays without drastic changes even when the style transforms dramatically.

Backend: FluxControlNetPipeline
This pipeline used from diffusers, to adjust LoRA weights based on users demands.

Visual Reasoning: DeepSeek-VL
Our app doesn't stop at visuals. A lightweight LLM module provides:

Atmosphere commentary (e.g., "This space feels contemplative and sterile")
Color psychology analysis
Material breakdown (e.g., "This wall texture resembles cast concrete with synthetic matte finish")
This adds a layer of narrative and insight to every output – because aesthetics aren't just visual; they're emotional and cognitive, too.

The UI is intentionally minimal, presented in a vertical layout with a step-by-step process:
Instructions First: Learn what to expect and how it works.
Upload Your Image: Choose a room or try one of our examples.
Pick a Style: Verner or Lumon. The extremes. No compromises.
Add a Prompt: "A cozy meditation pod," "Boardroom in a 70s nightclub," etc.
Adjust Settings: Inference Steps, Guidance Scale, ControlNet Scale, Palette Clusters, Gif Frame(m/s) – tune it to taste.
Generate: Watch your input transform across several iterations.
Each generation outputs:
A color palette wheel (with exact RGB/hex values)
LLM commentary on atmosphere, color psychology analysis and materiality
A **GIF showing** the transformation across iterations
Download package containing all outputs and metadata
Panton vs Lumon started as an aesthetics quesion, turned into a technical challenge, and ended as a commentary on taste, extremism, and the plasticity of space in the age of generative design.

This app isn't meant to be practical. It's meant to provoke, inspire, and maybe confuse you a little. It's a creative tool disguised as a thought experiment – or maybe the other way around.

step 1

Generate image

load image: choose from examples or your own

style: choose 1 of 2 loras for style effect

enter prompt: write prompt for interior space including trigger lora word

settings: fill in all settings needed for wished image generation

step 2

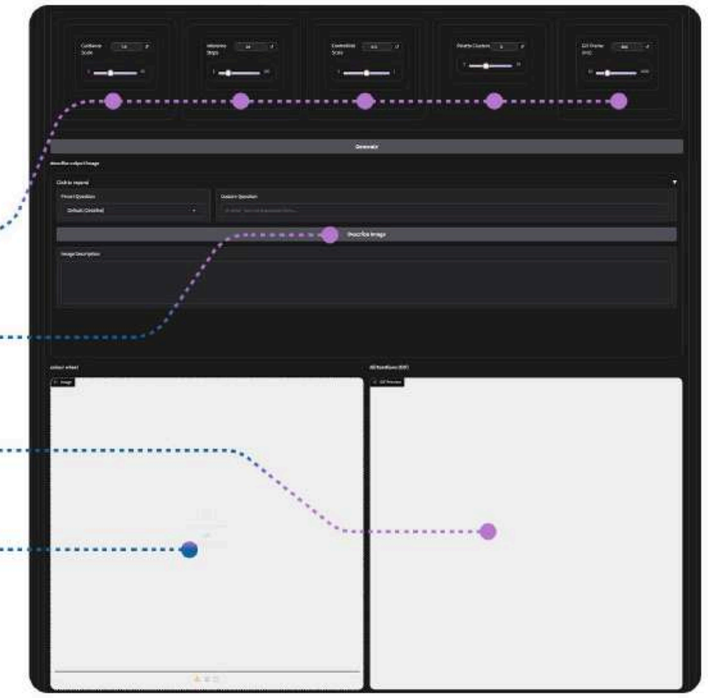
Enhance output

change settings: from prompt to custom properties to new image

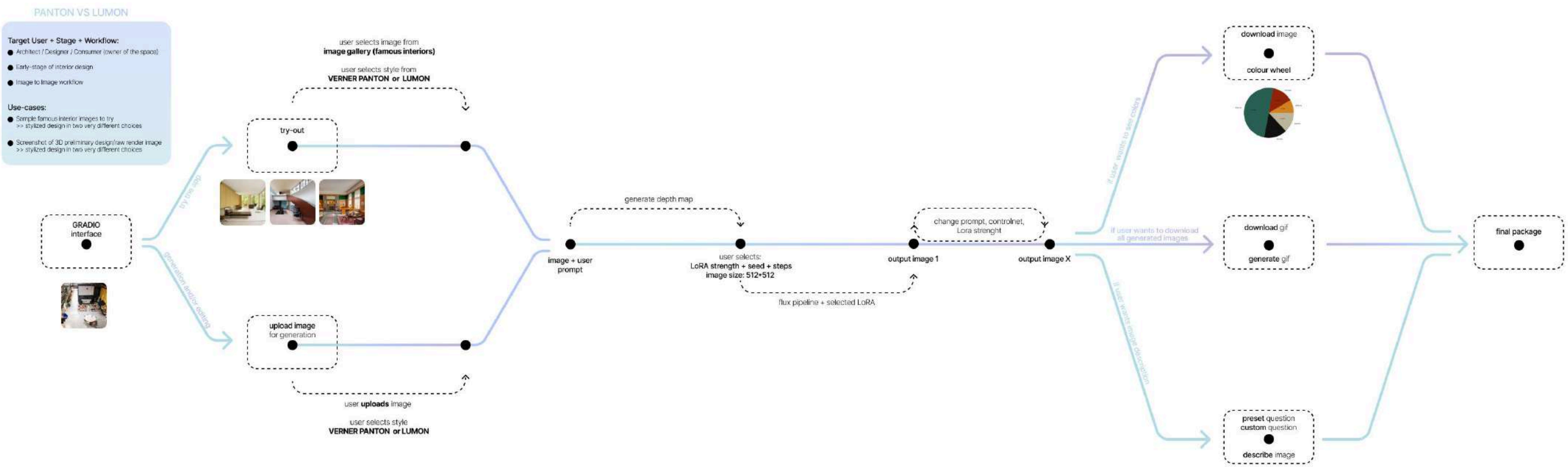
describe: get interior descriptions ready for client presentation

generate gif: create gif of all versions, starting from initial image

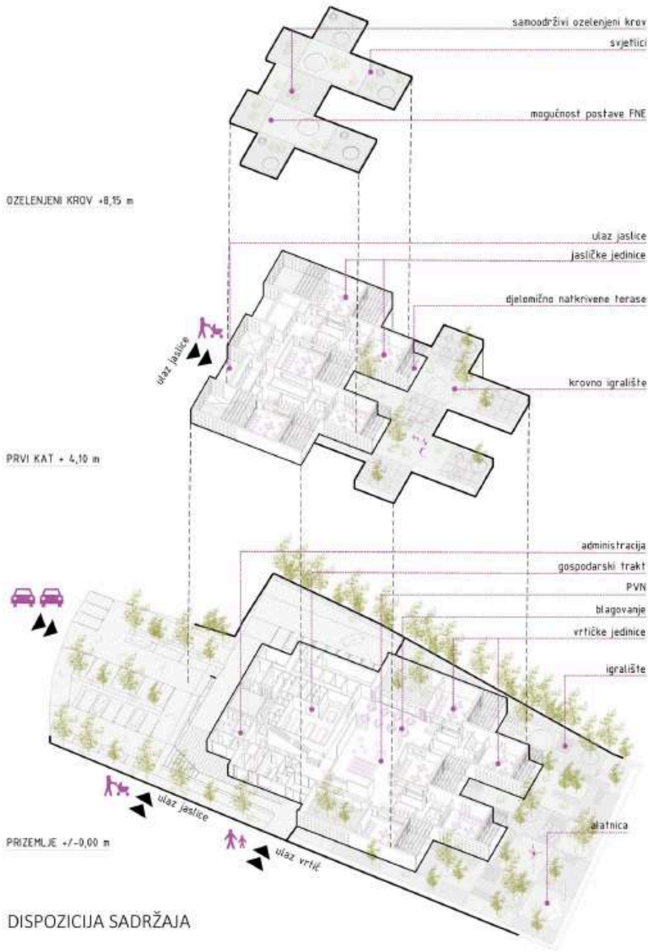
colour wheel: download colour wheel palette for mood borad analysis



web app made with gradio



workflow diagram



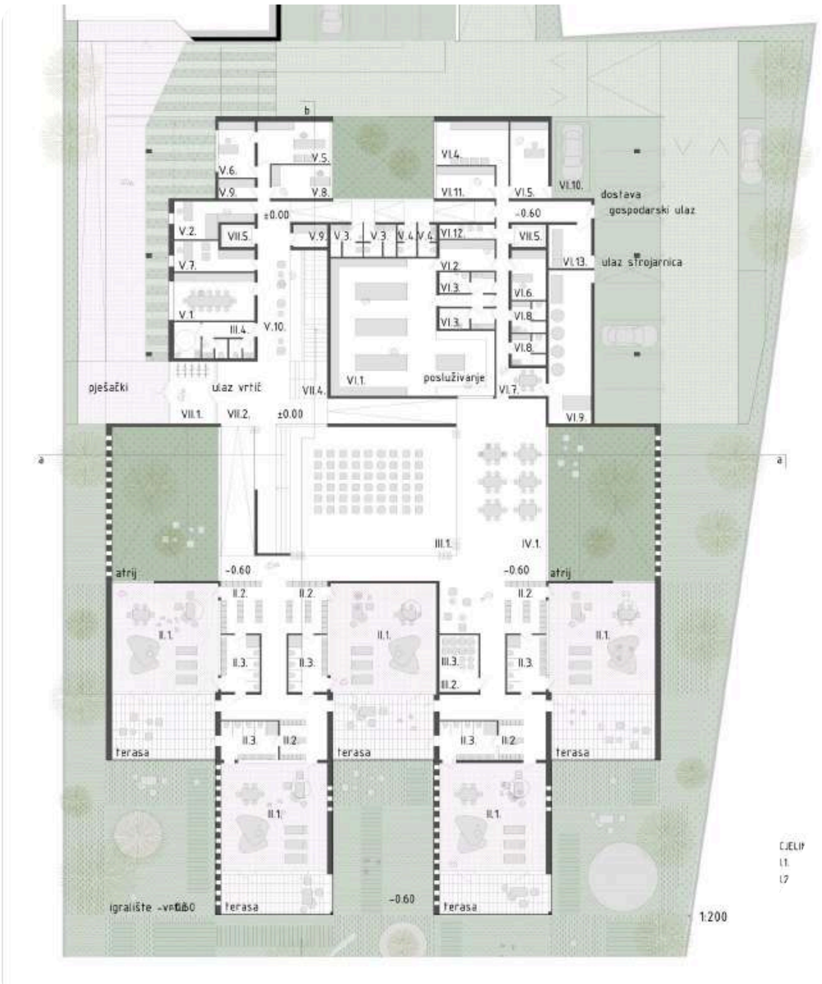
Kindergarten Valmade

co-authors: Frane Dumandžić, Lucija Jelenčić, Kata Marunica, Natja Mihaldinec, Zrinka Miočić, Nenad Ravnić, Filip Vidović
year: 2023

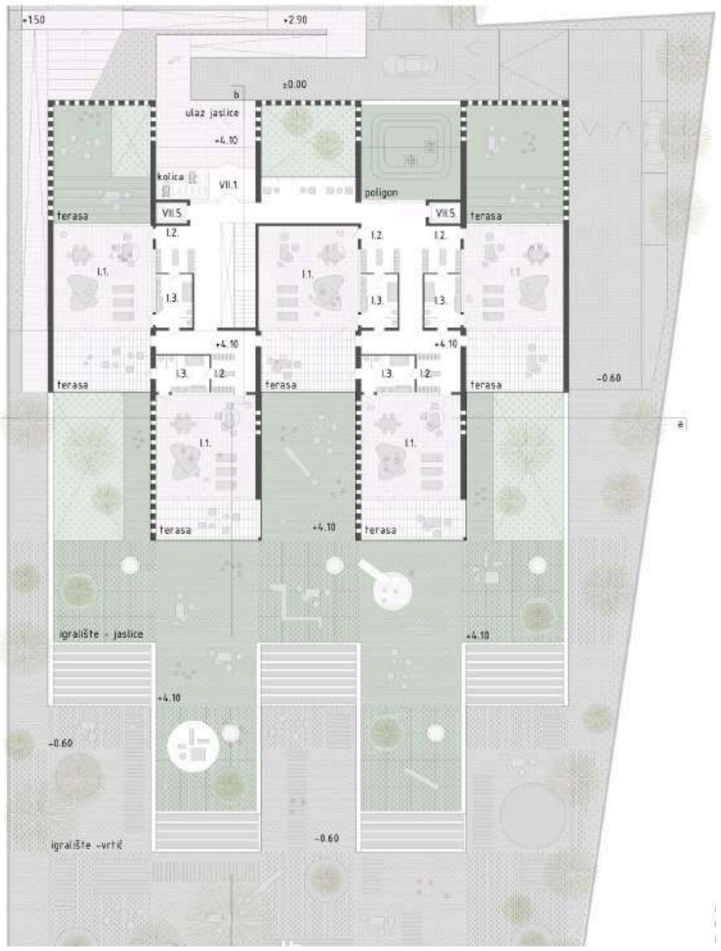
https://nfo.hr/portfolio/competition-for-conceptual-architectural-and-urban-design-kindergarten-pula/
programmes used: autocad, lumion, sketchup

The site of the future Jarun Kindergarten is a partially consolidated area, bordered on the east and west by low-rise residential buildings. Its northern and southern edges are currently undeveloped. According to the local urban development plan (UPU), the northern area is designated to become a public square, while the southern edge opens toward **Lake Jarun**, remaining free of construction.
Located in close proximity to existing residential buildings, the site minimizes the need for car or public transport, making it highly suitable for a kindergarten. The surrounding context is calm and moderately built, with low density and an open southern exposure. These characteristics provide a favorable setting for early childhood development.

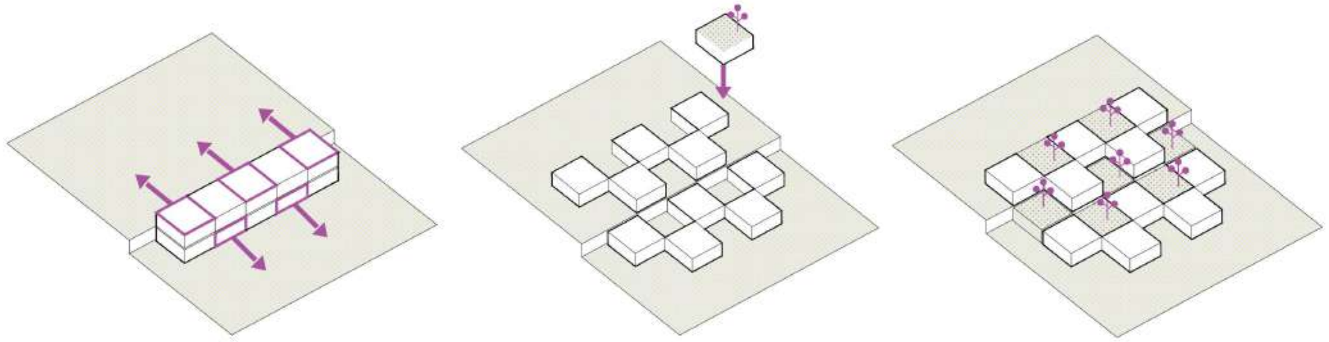
A key spatial limitation is the presence of a water pumping station, which reduces the usable portion of the plot to its northern edge. The challenge lies in harmonizing the advantages of the existing context with the need to compress the program within this restricted area. However, spatial compression doesn't have to result in a dense or rigid form. In response, the design proposes a **highly indented ground floor geometry**. This articulation of the footprint significantly increases the façade surface, allowing natural light to reach even the most recessed parts of the building.
The layout of the classrooms **creates green, south-facing garden bays**, offering each unit direct and partially sheltered contact with nature. This configuration allows for natural light and ventilation from three sides and strengthens **visual connections** between rooms.
At the heart of the kindergarten is a two-story multipurpose space, serving as a visual and functional anchor for the entire complex. The children's dining area is located on the upper level and partially shares this open volume, creating a **spatially rich and inviting central public zone**. The classrooms are arranged around this core, enhancing connectivity and cohesion.
The overall design aims to create a warm, inclusive environment—a central landscape where children can play, learn, and explore the world freely and safely.



ground floor

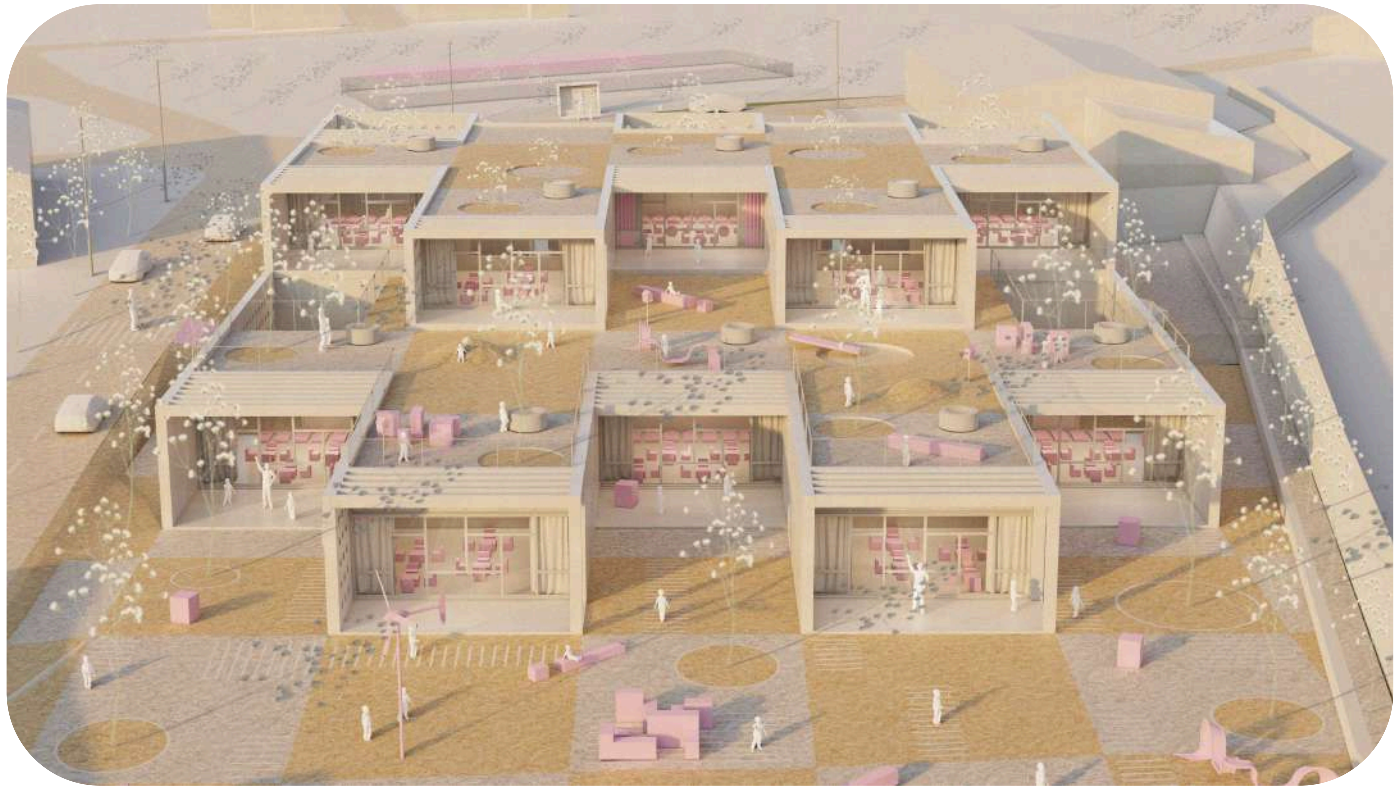


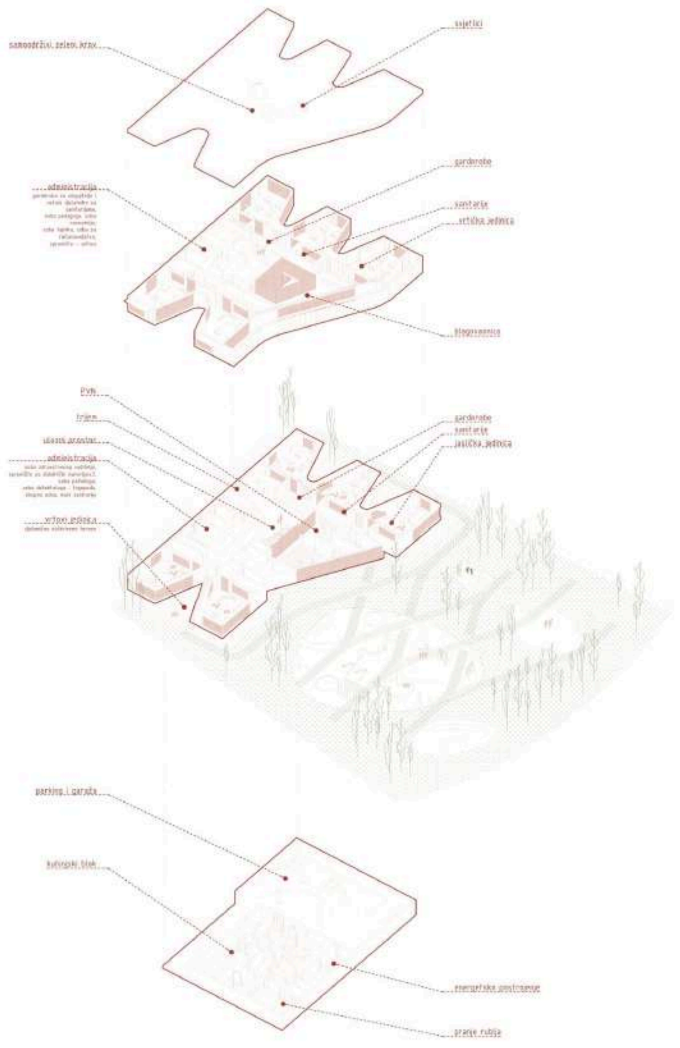
first floor



schematic design proposal

section





Kindergarten Jarun

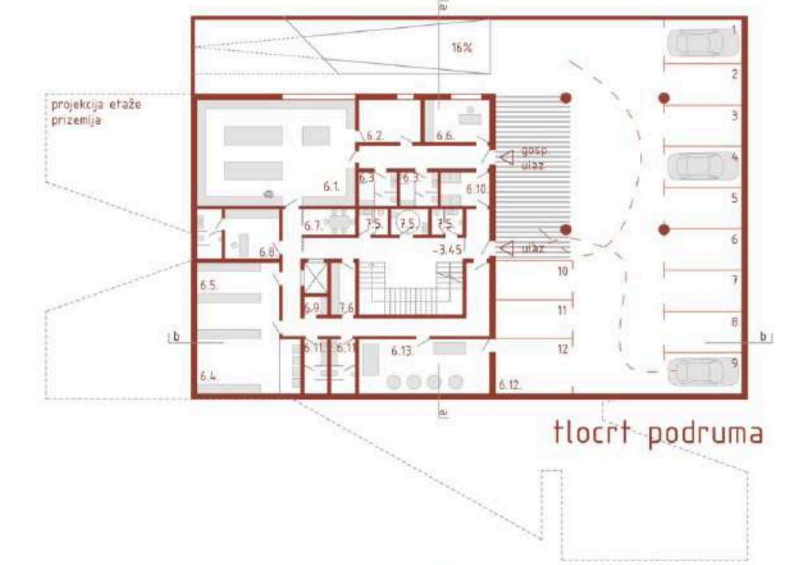
co-authors: Lucija Jelenčić, Kata Marunica, Natja Mihaldinec, Mirta Mesić, Nenad Ravnić, Filip Vidović
year: 2023/24

https://nfo.hr/portfolio/kindergarten-in-pula/
programmes used: autocad, lumion, sketchup

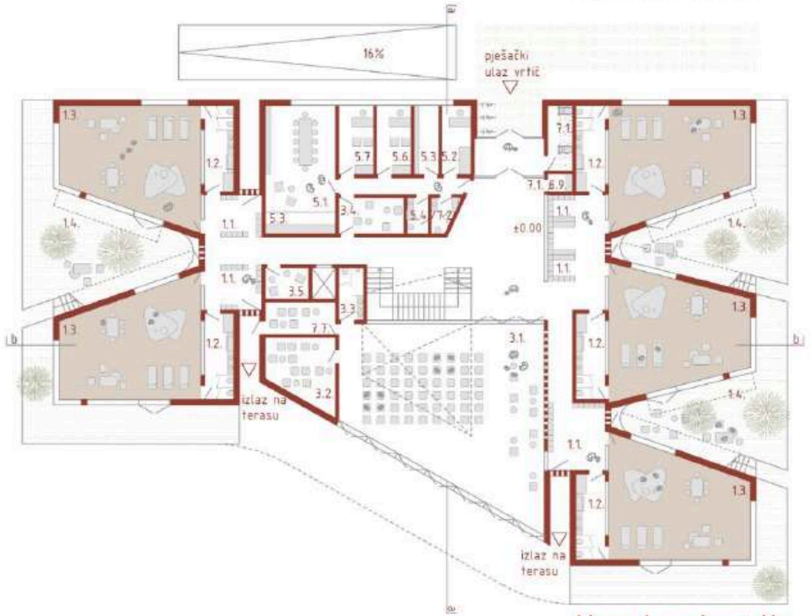
A gently tiered "mat" structure is laid across the site, defined by the interplay of open and enclosed spaces. This approach creates a multisensory environment—a **"city for children"**—with inclusive, scale-appropriate courtyards where children can play freely while remaining easily visible to staff.
The program is vertically zoned: kindergarten units are located on the ground floor, opening to southern courtyards. Administrative, utility, and staff areas occupy the northern and eastern edges of the building, while the PVN (central multipurpose space) forms the heart of the complex, accessible to all children. Nursery units, along with their related indoor and outdoor areas, are placed on the first floor.
Access to the kindergarten is from the northern edge of the site, where a series of terraced ground levels provide the necessary number of parking spaces, along with both vehicular and pedestrian entry to the ground and first floors. Reclaiming what was taken from nature, the **building's green roofs** become outdoor terraces for the nursery. From this elevated vantage point—their **"nest"**—the youngest children can safely observe their older peers as they play and learn.

Multisensory Space
Perceiving space through **all senses** is especially important in the context of a kindergarten. By engaging not only the visual, but also the tactile, auditory, and olfactory senses, the design can meaningfully enhance children's development.
The warmth of sunlit brick.
The creak of wooden floors underfoot.
The echo in a high-volume room.
The calm of a quiet nook.
The hum of the street outside.
The scent of blooming flowers.
The sound of birds in the courtyard...

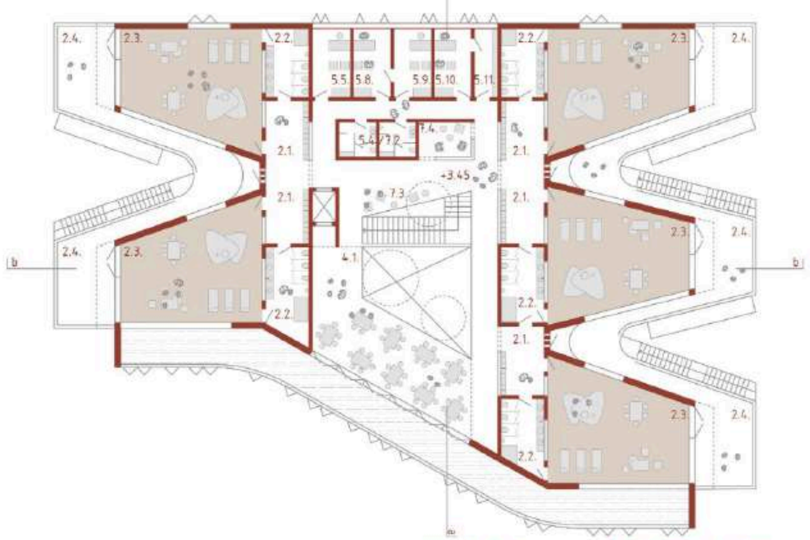
Architecture here becomes a **sensory collage**. The building guides children by mapping different zones through distinct sensory cues, aiding orientation and memory while enriching daily experiences.
The kindergarten becomes not only a place for care and learning—but a kind of sensory playground, a **rich landscape of experiences** that supports exploration, growth, and a joyful discovery of the world.



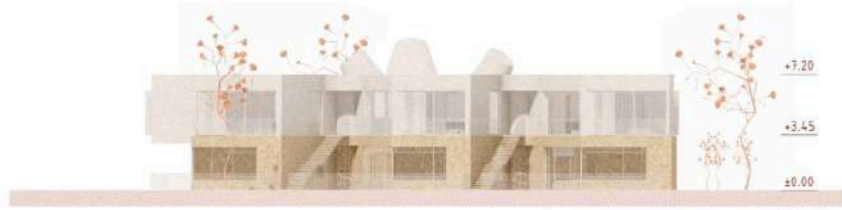
tlocrt podruma



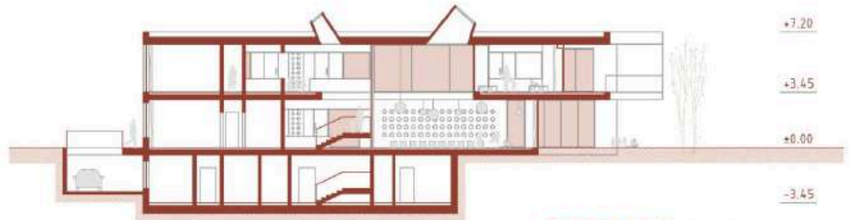
tlocrt prizemlja



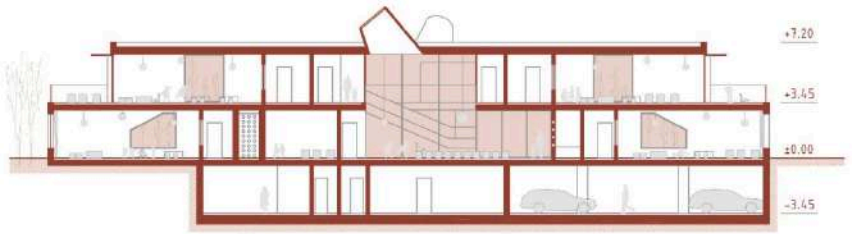
M 1:250 tlocrt kata



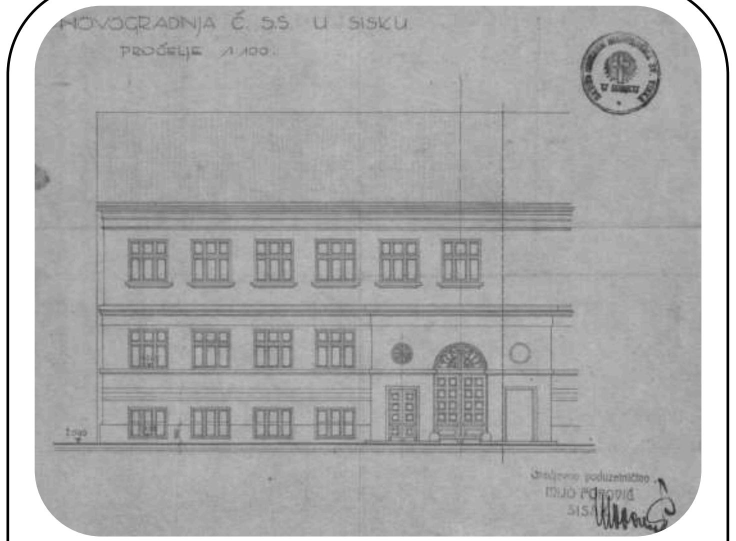
jugozapadno pročelje



PRESJEK a-a



PRESJEK b-b

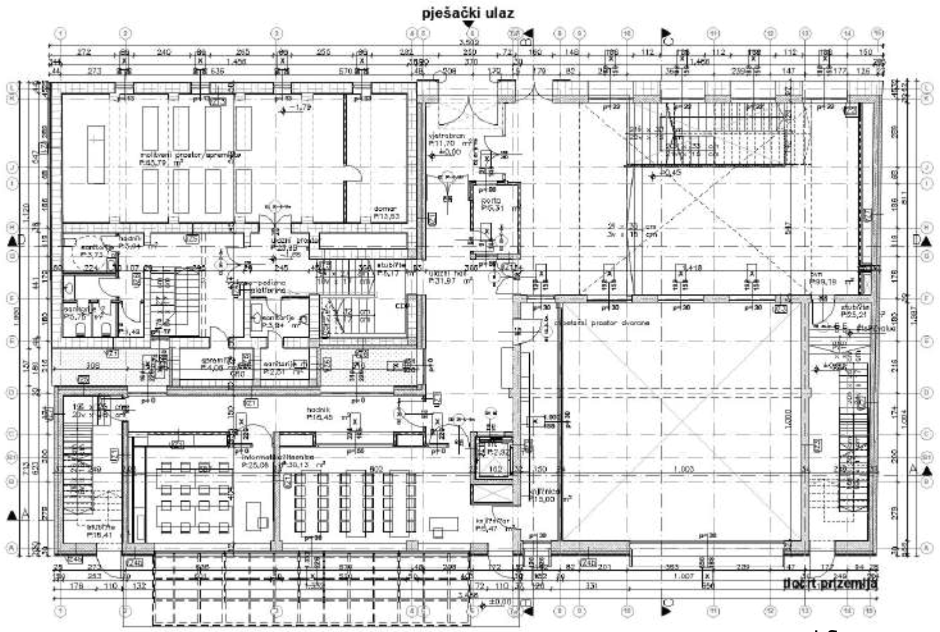


Primary school OKŠ

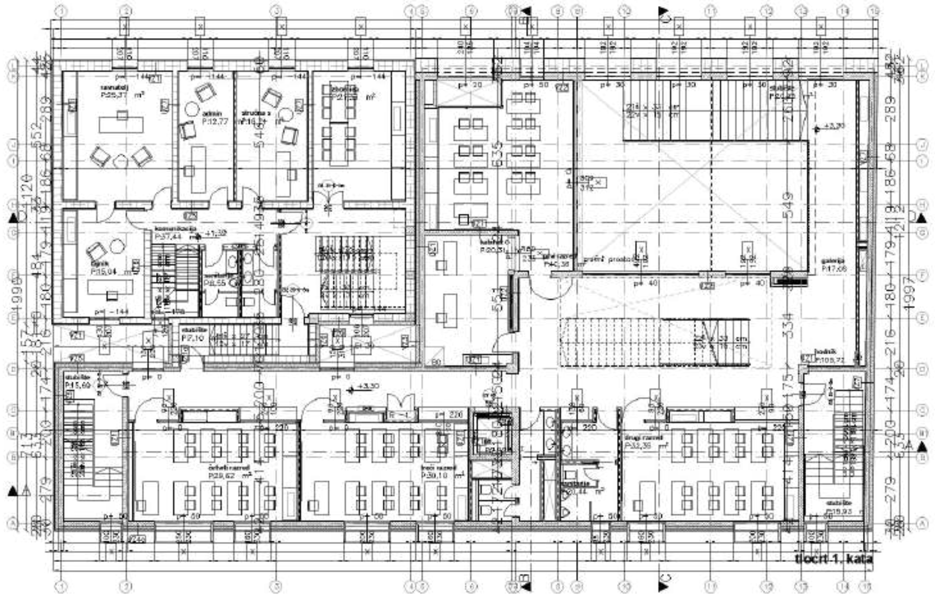
co-authors: Kata Marunica, Nenad Ravnić
year: 2023/24

programmes used: archicad, lumion, sketchup

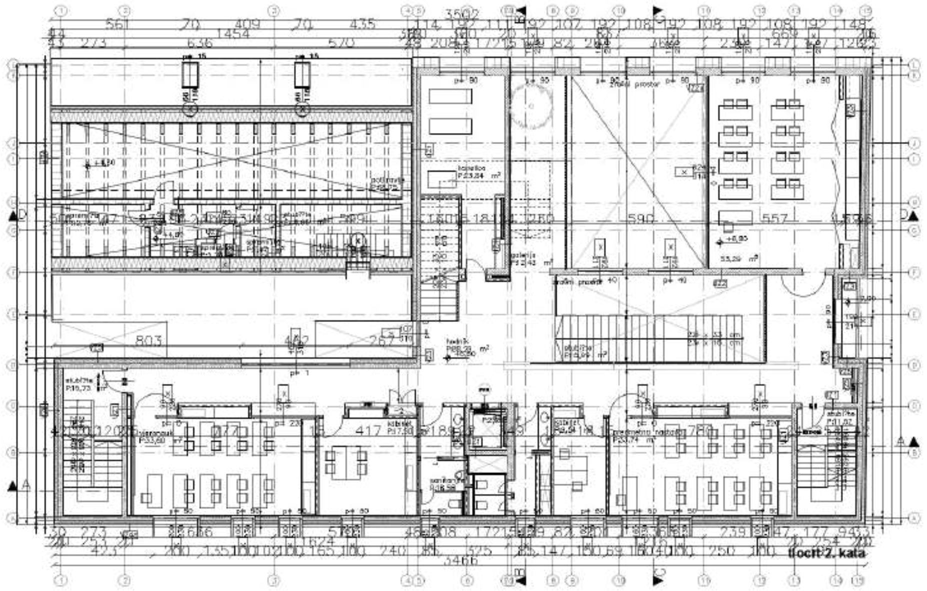
The project concerns the Reconstruction and Extension of the Catholic **Primary School** Sisak, located at 14 King Tomislav Street.The project site is situated within the city of Sisak, on cadastral parcels 1341/2 and 1341/3, where two existing buildings are located. The intervention area is rectangular in shape, with approximate dimensions of 35 × 65.5 m and a total surface of 2,267 m². On the site today stand the Convent of the Sisters of Mercy and the Vrbina Sisak Children's Home.
The existing convent building will be **preserved and repurposed**. It consists of a basement, ground floor, and attic with a pitched roof, measuring approximately 15.5 × 11 m in footprint, with a ridge height of 9.77 m. From the existing children's home, only the façade will be retained, while a new school building will be constructed behind it. Access to the parcel and the buildings is from the northeast side, via King Tomislav Street, which provides both pedestrian and vehicular entry.
Planned Construction
The new school is conceived as two connected parts:
The existing convent building with a pitched roof, to be repurposed for school use.
Basement: changing rooms and sanitary facilities
Ground floor: administration offices
Attic: archive
The new extension, composed of two volumes:
A part with a pitched roof, where the existing façade is preserved
A courtyard wing with a flat roof
Within the extension:
Basement: dining hall, kitchen, storage rooms, and sports hall with accompanying locker rooms
Upper floors: classrooms with associated cabinets and sanitary facilities, as well as a library and reading room
Building Heights and Layout
Convent ridge height: 9.77 m
Former children's home ridge height: 15.89 m
Newly designed building roof height: 15 m from the final leveled terrain at the façade
The total building footprint is approx. 680 m².
The structure borders the northeast, southeast, and northwest property lines, while being 43.7 m away from the southwest boundary.
Outdoor Areas
The courtyard will include school playgrounds adapted to student needs. Access paths and outdoor terraces will be paved with weather-resistant materials. A sports and recreation field will be further developed in subsequent project phases.
Construction and Materials
The new school extension is planned as a reinforced concrete structure with brick infill (subject to further refinement during design development), founded on a base slab or strip foundations, to be detailed in later project stages.
High-standard materials will be used, ensuring excellent thermal and acoustic performance, adapted to local climate conditions. These aspects will be elaborated in the building physics and acoustic protection studies, integral to the main project documentation. Adequate solar shading and protection against overheating will also be provided.
Existing Building Works
The existing convent will retain its current façade system. Only minimal construction modifications are foreseen, limited to what is necessary for school functioning. Planned works include the replacement of worn-out floors and suspended ceilings.



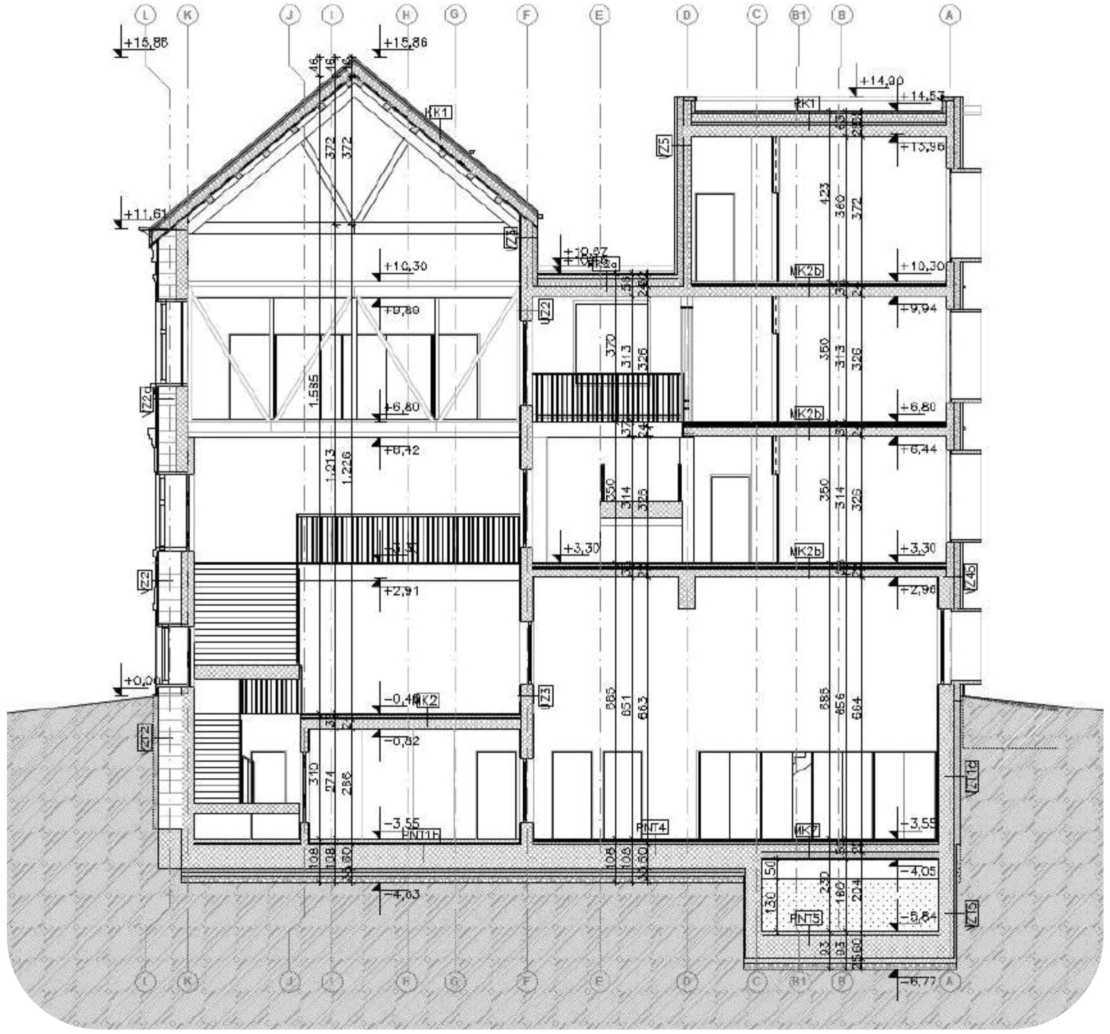
ground floor



first floor



second floor



section c-c