Yusuf Aykin

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Education

Technische Hochschule Ostwestfalen-Lippe , M.Eng. in Integrated Design – Detmold, Germany Oct 2022 – July 2024

Kadir Has University, B.Arch. in Architecture – Istanbul, Türkiye Aug 2014 – June 2020

Experience

Research Assistant, Technische Hochschule Ostwestfalen-Lippe – Detmold, Germany Jan 2023 – Oct 2025

- Engineered full-stack AI pipelines for 3D point cloud object detection, registration, and manipulation, integrating Python (Open3D, PyTorch) and MATLAB for real-time deployment on robotic platforms.
- Led robotics integration across 3 labs, managing UR and KUKA robotic arms for autonomous construction workflows.
- Delivered research outcomes at international conferences (ISARC Montréal), academic showcases (NRW-TAG Köln), and political platforms (CDU Konferenz Münster).
- Designed and facilitated 5 advanced workshops on computer vision, neural networks, and low-code AI tools (ComfyUI), engaging interdisciplinary master's students.
- Deployed production-grade Docker containers with GPU acceleration on NVIDIA A100 infrastructure, enabling scalable deep learning workflows for large language models (LLMs) and image generation models (SD, Flux) and maintained CI/CD pipelines for continuous experimentation and rapid iteration.
- Built a secure, collaborative image labeling web app for university-wide annotation and training tasks using React, Next.js, Firebase, and Node.js; integrated YOLOv11 backend for real-time preview and dataset export.
- Authored and co-authored research proposals focusing on Digital Twin ecosystems, on-site robotic earthworks, AI-driven concierges, and swarm robotic systems.
- Developed a Unity-based HoloLens application to visualize and interact with IFC building models in real-time AR, enabling hands-free, spatial BIM analysis.

Teaching Assistant, Kadir Has University – Istanbul, Türkiye Sept 2020 – June 2021

- Assisted professors in teaching undergraduate courses on computational design, focusing on algorithmic thinking and digital fabrication techniques.
- Provided hands-on instruction in Rhino3D, Grasshopper, and V-Ray, guiding students through parametric modeling workflows and rendering pipelines.
- Supported curriculum development and student project reviews in studio-based learning environments.

Academic Researcher, TUBITAK – Istanbul, Türkiye June 2020 – June 2022

- Conducted interdisciplinary research under a €50,000 grant titled *"Development of Computational Tools for Design Processes of Geometric Pattern-Based Muqarnas."*
- Carried out photogrammetric documentation of 30 historical muqarnas structures across Anatolia to extract geometric rules and generative logic.
- Developed custom parametric modeling and pattern generation algorithms in Python to reconstruct and reinterpret Seljuk-era ornamental vaulting systems.
- Co-organized and led a computational design workshop at MSTAS 2021, showcasing the algorithmic generation of historic Islamic geometries.
- Published two peer-reviewed papers in Q1-ranked journals (ACM JOCCH and Nexus Network Journal), contributing original methodologies to the field of architectural computation and heritage analysis.

Architectural Intern, DILEKCI Architects – Istanbul, Türkiye June 2019 – Sept 2019

- Developed a Python-based analytics tool to scrape and categorize social media data, generating visual infographics to support project proposals and client presentations.
- Produced high-quality architectural renderings for interior and exterior design projects using V-Ray and Lumion.

- Assisted in parametric modeling and design development using Grasshopper3D, contributing to both conceptual and technical phases of ongoing architecture projects.

Freelance

Software Developer, Digitales Bauen – Karlsruhe, Germany Feb 2025 – May 2025

- Designed and implemented generative floor plan algorithms using evolutionary computation in Python and RhinoScript, enabling rule-based plan optimization.
- Integrated parametric logic with Excel-based user input for dynamic constraint control, allowing non-programmers to define building requirements and performance criteria.
- Automated plan generation workflows in Rhino3D, producing visually annotated design variants ranked by performance metrics such as area efficiency, adjacency logic, and compliance with zoning rules.

Facade Designer, Facade Design Factory – Istanbul, Türkiye Jan 2025

- Developed full-scale parametric models of the canopy façade for Cevahir Shopping Mall using Grasshopper3D, based on architectural intent and 2D fabrication drawings.
- Generated system-level façade details, including panelization logic, substructure connections, and fabrication-ready part geometries with material tolerances.
- Provided design-for-manufacturing feedback and proposed optimizations for joint interfaces, anchoring solutions, and assembly sequencing.

Generative Artist, FxHash June 2021 – present

- Designed and deployed 10 math-driven generative art projects using p5.js and three.js, published on the Tezos and Ethereum blockchains via FxHash and custom smart contracts.
- Built fully on-chain interactive artworks leveraging algorithmic randomness, geometric systems, and custom rendering pipelines.
- Generated over six figures(€) in revenue through sales to 1,362 unique collectors worldwide.
- Exhibited works at four international digital art exhibitions, contributing to the emerging field of crypto-art and generative aesthetics.

Publications

Enhancing Robotic Vision through Deep Learning Techniques: From Detection to Construction July 2025

to-be-published-soon. (International Symposium on Automation and Robotics in Construction)

A Recursive Algorithm for the Generative Study of Seljuk Muqarnas in Kayseri and Sivas Apr 2023

10.1007/s00004-023-00686-4 (Nexus Network Journal)

Computational Modeling and Analysis of Seljukid Muqarnas in Kayseri Apr 2022

10.1145/3477399 (ACM Journal on Computing and Cultural Heritage)

Skills

Programming & Frameworks: Python, JavaScript, Flask, Node.js, RhinoScript, p5.js, Three.js

AI & Vision: PyTorch, YOLO, OpenCV, ComfyUI, Open3D, image labeling pipelines

3D Modeling & BIM: Rhino3D, Grasshopper, Revit, Blender, Agisoft Metashape, AutoCAD

Rendering & Visualization: V-Ray, Lumion, Adobe Photoshop, Adobe Illustrator, Adobe After Effects

Web & DevOps Tools: React, Next.js, Docker, Git, Firebase

XR & Robotics: Unity3D, HoloLens (MRTK), MATLAB, robotic arm control (UR/KUKA), Unreal Engine

Design Computation: Parametric modeling, generative algorithms, geometric analysis

Languages: Turkish (native), English (fluent), German (basic)