

Hossein Nazari

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Personal Profile

A computational designer and architect with over 4 years of experience in developing digital tools for architecture and urban planning. Skilled in Python, C#, Rhino, and Grasshopper, with a proven track record of creating custom plugins, generative design models, and simulation workflows. Experienced in projects involving social digital twins (TectoTrack), sensor-based data gathering, and urban living labs. Passionate about driving early-stage planning through computation and interdisciplinary collaboration, with a focus on sustainability and user-centered design.

Education

- **Master of Architecture in Sustainable Architecture**
 - Iran University of Science And Technology(IUST), 2022
 - Thesis: Impact of Buildings Alignment on Energy Efficiency. Tehran, Iran
- **Bachelor of Architecture**
 - Soore University, 2016
 - Thesis: Designing a Respiratory Rehabilitation Hotel-Hospital. Urmia, Iran

Professional Experience

- **Computational Design Lead** | *Morphotect* | 2023 - Present
 - Developed agent-based models in Python to simulate human-environment interactions as part of the Social Digital Twin project, enabling real-time behavioral analysis in urban environments.
 - Built a BIM-to-Unity data streaming system, integrating Revit models into Unity for immersive urban experience simulations.
 - Designed data processing frameworks to analyze large-scale simulation outputs and generate design insights for urban and architectural projects.
 - Developed generative modeling workflows for design automation and environmental analysis.
 - Led a national Agent-Based Modeling Bootcamp with 42 participants, mentoring 12 projects through the full modeling pipeline from coding to result interpretation.
- **Research & Teaching Assistant** | *Iran University of Science and Technology* | 2022 - 2024
 - Designed and developed generative models to simulate building alignment patterns for energy performance evaluation in urban blocks.
 - Created a full workflow combining generative modeling → simulation-based evaluation → optimization, using brute-force sampling to explore correlations between design parameters and energy consumption.
 - Focused on urban regulation compliance, generating urban forms that satisfied Tehran's zoning laws while optimizing daylight access and energy efficiency.
 - Developed Python-based tools to automate parametric studies and performance assessments.
 - Supported teaching in computational design studios, introducing students to Rhino, Grasshopper, and Python for performance-driven urban and architectural workflows.

- **Independent Instructor** | *Independent* | 2022 - Present

- Designed and taught specialized courses in generative design, parametric modeling, and environmental simulation using Rhino, Grasshopper, Climate Studio, and Python.
- Emphasized practical application of performance-based workflows in architecture and urban design projects.

- **Founder of NexoNest** | *NexoNest* | 2021 - Present

- Founded NexoNest, focusing on developing computational design tools for early-stage architecture and urban analysis.
- Created the Octo plugin family (OctoMass, OctoLand, OctoCity, OctoGen) for Rhino/Grasshopper, providing generative design solutions across building, landscape, and city scales.
- Published OctoMass for environmental-driven massing studies, enabling designers to generate and evaluate climate-responsive building forms.
- Bridged architectural research and software development to advance computational sustainability approaches.

Technical Skills

- **Programming Languages**

- Python - Advanced
 - Developed custom libraries, plugins, and automation scripts for architectural and urban workflows.
 - Extensive experience in generative design, agent-based modeling, and environmental performance analysis.
- C# - Intermediate
 - Built plugins and tools for Rhino and Unity integration.
 - Used in developing simulation, visualization workflows, and the Octo plugin family for sustainable design.

- **Web Development**

- HTML/CSS: Experience in building and styling web interfaces for design tools and dashboards.
- JavaScript: Developed interactive features for web-based applications (e.g., data visualization, user input forms).
- Projects: Developed [NexoNest.com](https://nexonest.com) (currently under development).

- **Software & Tools**

- Rhino - Expert
 - Proficient in advanced 3D modeling, scripting (Python, C#), and automation workflows.
- Grasshopper - Advanced
 - Developed custom components for generative and performance-based design.
- Project Highlight: Author of OctoMass plugin (published on Food4Rhino).
- Rhino Inside: Proficient
 - Seamless data exchange across platforms (Rhino, Revit, Unity).
- Revit - Proficient
 - Experienced in BIM modeling, geometry extraction, and integration with simulation tools for performance analysis.
- Ladybug Tools / Climate Studio - Expert
 - Applied extensively for environmental simulation and early-stage performance evaluation in architectural projects.

- **Hardware & IoT**

- Arduino & Raspberry Pi
 - Designed interactive prototypes for kinetic architecture and responsive environments.
- Sensor Integration:
 - Experience integrating sensors (e.g., temperature, motion, light) with Arduino and Raspberry Pi for real-time data collection and analysis.
- Projects Highlights
 - Developed systems including Lighting Control System, Kinetic Facade, and Polargraph Drawing Machine.

Areas of Expertise

- **Computational Design & Development**

- Plugin Development:
 - Designed and implemented custom plugins for Rhino, Grasshopper, and Revit to streamline architectural and urban design workflows.
- CAD Integration:
 - Integrated Rhino, Revit, and Unity for seamless geometry and data exchange.
 - Developed automation pipelines using Rhino.Inside and Unity scripting.
- Computational Geometry:
 - Created algorithms for generative form-finding, surface analysis, and parametric urban form exploration, supporting performance-driven design.
- Agent-Based Modeling
 - Simulated human-environment interactions using Python-based ABM platforms, applied in social digital twin projects such as TectoTrack.

- **Data & Optimization**

- Data Analysis & Visualization
 - Applied evolutionary strategies and rule-based logic for performance-based architectural and urban design. zation & AI.
 - Familiar with machine learning libraries (e.g., Scikit-learn) for design optimization and classification tasks.
- IoT & Smart Systems
- Interactive Systems Development
 - Developed systems using Arduino and Raspberry Pi for real-time environmental sensing and responsive architectural elements.
 - Project highlights include kinetic facades, environmental data logging systems, and the Polargraph drawing machine.

- **Software Development Practices**

- Version Control
 - Proficient in Git and GitHub for team-based development, code management, and open-source contributions.
- Agile Methodologies
 - Experienced working in Scrum and Kanban teams; comfortable with iterative and fast-paced development cycles.
- Clean Code Practices
 - Focused on writing maintainable, readable, and efficient code following best software development practices.

Soft Skills

- **Analytical & Problem-Solving**

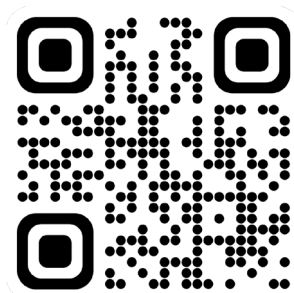
- Computational Thinking:
 - Skilled in decomposing complex challenges into structured, solvable components using design logic and technical methodologies.
- Root-Cause Problem-Solving:
 - Experienced in diagnosing system bottlenecks, identifying critical issues, and implementing scalable, practical solutions.
- Critical Evaluation
 - Proficient in analyzing design alternatives and making data-driven decisions based on simulation results and performance feedback.

- **Teamwork & Collaboration**

- Interdisciplinary Collaboration:
 - Successfully collaborated across architecture, urban planning, and software development teams to achieve integrated design goals.
- Mentorship and Knowledge Sharing:
 - Actively mentored students and junior team members, guiding them in adopting computational tools, workflows, and performance-based design strategies.

- **Adaptability & Learning**

- Technical Agility
 - Quick to learn and apply new tools, APIs, and methodologies in response to dynamic project requirements and technological advancements.
- Resilience Under Pressure
 - Maintains focus, productivity, and quality in fast-paced, iterative design and development environments.



References

- **Dr. Abbas Tarkashvand**

- Assistant Professor of Architecture, Iran University of Science and Technology (IUST)
- Email: Tarkashvand@iust.ac.ir | Phone: +98 912 199 4632

- **Mr. Ali Jabbari Jahromi**

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