ARCH 540
Designing the Design: AI-Assisted Workflows for Architecture
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Term: Winter Term 2, 2025–26 | **Meets:** Tue/Fri 1:30pm-6:00pm

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Introduction

Artificial Intelligence now appears capable of doing almost everything in design. Large Language Models can interpret design briefs, text-to-image platforms generate concepts, diffusion models render scenes, and machine learning tools automate modeling, code-writing, documentation, and even robotic fabrication. These rapid advances raise urgent questions: how far can these technologies really go? How soon will they become part of everyday practice? And most importantly, what remains the unique role of the architect?

Moments of technological transition are not new to the discipline. When CAD replaced hand drafting in the 1980s, architects feared the loss of craft. Instead, CAD became a ubiquitous tool, accelerating workflows and enabling new methods of design. Similar transformations occurred with GIS, BIM, and parametric design. Each tool reshaped the way architects work and, in some cases, altered the very forms and languages of architecture.

This studio situates itself at a comparable threshold. Rather than speculating through futuristic imagery, we will critically examine AI as it enters daily workflows. Our interest is not in producing visions of cyberpunk skylines, but in asking: like CAD before it, how might AI **assist, augment, automate,** or even **authorize** design practice?

The central task of this studio is *designing the design*. Students will not be asked to deliver a building proposal, but to develop a proof-of-concept tool or workflow that demonstrates how AI might transform architectural processes. Every tool embodies a logic; designing a workflow is therefore also designing a method. In this sense, students will design not just artifacts, but the conditions through which artifacts are imagined and produced.

AI is a general-purpose technology, but for it to become meaningful in architecture it must be tailored and adapted. This studio does not aim to build entirely new AI models. Instead, students will begin with existing platforms and applications, then ask how these tools can be integrated into disciplinary workflows, how they might be adapted to carry architectural knowledge, and how they can be fine-tuned to respond to local contexts and datasets.

Students will work in groups of 2–3. The studio will unfold through three staged exercises, moving from technical exploration, to workflow research, to speculative prototyping.

Schedule

Exercise 1: Experiment

Students will begin by exploring a range of AI techniques to understand their capabilities and limits. These include:

- Image generation (Midjourney, Stable Diffusion, Runway, etc.)
- 3D modeling and parametric integration (AI-assisted Rhino/Grasshopper workflows)
- Language models (AI agents for bylaw analysis, data processing, or workflow assistance)
- Customized synthesis (GANs/Diffusion-based models to generate section, plan, façade, surrogate models, simulations, etc.)

Objective: gain familiarity with state-of-the-art tools, evaluate where they succeed, and recognize their limitations.

Exercise 2: Investigate

Each group will select one specific architectural or landscape workflow, for example, public engagement in pocket park design, shadow analysis under zoning bylaws, conceptual physical modeling, or rendering/material assignment. Students will:

- Map the current workflow through diagrams and interviews with practitioners
- Identify challenges and bottlenecks within the process
- Speculate how AI could transform this workflow now, in 5 years, and in 15 years
- Discuss emerging roles for architects and possible risks of adoption

Objective: connect AI capabilities to real-world professional practices, moving from technical fascination to disciplinary relevance.

Exercise 3: Prototype

Building on their research, each group will prototype a small fragment of the envisioned AI-assisted workflow. The prototype may involve testing datasets, customizing an existing model, or creating a staged demonstration of how a process could work. Perfection is not the goal: “fake it until you make it” is acceptable.

Objective: produce a tangible proof-of-concept that makes future workflows visible and discussable, highlighting both opportunities and limits of AI integration.