

# Learning Matters

Exploring Artificial Intelligence in Architecture and Design

Instructor: Ardavan Bidgoli [abidgoli@andrew.cmu.edu]

With the recent blooming of artificial intelligence (AI) and machine learning (ML) came a renewed interest in how these technologies may impact architecture and other creative practices. *Learning Matters* introduces students to this emerging field, giving them the tools to make their own machine-learning based design tools by adapting state-of-the-art models, developing new models, and understanding how data shapes machine learning processes.

The course places a particular emphasis on machine learning interfaces. Similar to other rule-based computational design approaches, users can interact with machine learning models through scripting. However, machine learning demands new approaches to interacting with data. By collecting, selecting, and generating data points, we will explore how bespoke interfaces can elicit new kinds of designing and making processes. Throughout this course, we explore this new field by curating data sets and training models on them.

Four fields of machine learning and their potentials in design and making problems will be explored: 1) unsupervised generative models, 2) reinforcement learning, 3) multimodal machine learning, 4) machine learning for robotics. Students will be introduced to the fundamental concepts of each field and get hands-on experience with state-of-the-art research and tools to implement them.