Ardavan Bidgoli

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EDUCATION

Carnegie Mellon University **Dec 2022**
Ph.D. in Computational Design Pittsburgh, PA
- Dissertation: Situated Collaborative Framework for ML-Based Toolmaking for Creative Practitioners

Pennsylvania State University **May 2016**
Master of Architecture in Design Computing University Park, PA
- Thesis: Motion Grammar for Robotic Fabrication

University of Tehran **Feb 2012**
Master of Architecture Tehran, Iran
- Thesis: Application and Evaluation of Algorithmic Procedures in Dwelling Projects

University of Tehran **Feb 2009**
Bachelor of Architecture Tehran, Iran

PROFESSIONAL EXPERIENCE

Autodesk Inc. **May 2019 – Aug 2019**
Robotics Creative Technologist Intern at Autodesk Robotics Lab (Pier9) San Francisco, CA
- Led Project *Chivo*, a Maya Machine Learning-based Plug-in for robotic Cinematography
- Implemented User-generated Data Pipeline, the DNN Model for Generating Camera Motions Using Keras, Maya Plugin, and the Interactive User Interface

Autodesk Inc. **May 2018 – Aug 2018**
Robotic Construction Intern at Autodesk BUILD Space Boston, MA
- Collaborated on Project *Automated Robotic Construction*, Human-Robot Collaborative Timber Structures Assembly [link]
- Implemented Computer Vision Algorithms for Pose Estimation Using OpenCV, Robot Mounted Computer Vision Assembly Using Raspberry Pi Camera, Robot Control Pipeline Using Machina

Autodesk Inc. **May 2017 – Aug 2017**
Design and Fabrication for AR/VR Intern at Autodesk Emerging Technologies San Francisco, CA
- Collaborated on Project *V-Dream*, an Immersive Platform for High-Dimensional Solution Space Navigation
- Designed and Implemented the VR Environment Using Stingray, Autodesk's Game Engine [link]

Autodesk Inc. **May 2016 – Aug 2016**
Computational Design and Fabrication Intern at Autodesk Applied Research Lab (Pier9) San Francisco, CA
- Designer at Project *MeshBot*, a Collaborative Automated Robotic Fabrication Platform for Integrating Industrial Robotic Arms, Computer Vision, and Computer Aided Manufacturing (CAM)
- Developed and Deployed Robotic End-effectors and the Associated Electronics Using Arduino [link]

Bentley Systems Inc. **May 2015 – Aug 2015**
Product Management Intern at Generative Component (GC) Team Exton, PA

RESEARCH PROJECTS

ThirdHand **May 2021 – Dec 2022**
Collaborative Machine Learning-based Toolmaking for Robotic Musical Instrument CMU
Primary Contributor, Participant Musician: Mahtab Nadalian

- Developed User-Generated Data Collection Using Motion Capture System, Machine Learning Model (Conditional Variational AutoEncoder) to Generate Strokes, and Robotic Santoor Instrument

SecondHand **May 2021 – Dec 2022**
Collaborative Machine Learning-based for Handwriting Typeface Generator CMU

- Developed User-Generated Data Collection Pipeline for Handwritten Samples, Interactive UI to Curate Data and Train Generative Model Using Dash Plotly, and Machine Learning Model (Conditional Variational AutoEncoder)

DeepCloud **Aug 2017 – Dec 2017**
Machine Learning-based Design Tool for Point Cloud Data CMU

- Adapted the Machine Learning Model for the Early-Stage-of-Design Sketching, Implemented the Interactive User Interface as a Web App Using Django

ML-based Vision Feedback Loop for Robotic Plastering **Aug 2017 – Dec 2017**
Machine Learning Computer Vision Feedback Loop for Robotically Plastered Surfaces CMU

- Developing Data Pipeline, Image Classifier Model, Real-time Image Projection for User Interaction

TEACHING EXPERIENCE

Inquiries into Machine Learning and Design **Jan 2021 – May 2022**
Graduate-level Course on Machine Learning Applications in Design and Architecture CMU

- Initiated the First Machine Learning in Architecture Course at CMU and Led the Team of Instructors
- Taught Machine Learning Model Implementation Using PyTorch, and Data Pipeline Design for user-Generated Data, Data Labeling, Auditing, and Curation

Introduction to Architectural Robotics **Aug 2018 – Dec 2022**
Graduate-level Course on the Industrial Robotic Arms Applications in Architecture CMU

- Taught Design for Computer-Aided Fabrication (CAM) Using Industrial Robotic Arms and Basics of Human-Robot Interaction, RAPID Programming Language, and Grasshopper Plug-in HAL

SKILLS

Modeling:

- 3D Modeling: **Rhino**
- Parametric Modeling: **Grasshopper**
- Game Engine: **Unity**

Programming:

- General Purpose: **Python**
- Web App Development: **JavaScript**, **HTML**

Frameworks:

- Deep Learning: **PyTorch**
- Dashboard**: Dash Plotly**
- Hardware Prototyping: **Arduino**

Robotics:

- General Purpose: **RobotStudio, ROS**
- Programming: **RAPID, HAL, Robot Component**

Digital Fabrication:

- 3D Print
- CNC

Misc.:

- Adobe Suite: **Illustrator**, **Photoshop, Premiere Pro**, **After Effects**
- Motion Capture: **Motive**