

Ardavan Bidgoli

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Portfolio: <https://www.ardavan.io> | GitHub: <https://github.com/ardibid> | LinkedIn: <https://www.linkedin.com/in/ardavanbidgoli>

Education

- 2022 (expected) **Carnegie Mellon University**, Pittsburgh, PA.
Ph.D. Candidate in Computational Design, Prof. Daniel Cardoso Llach.
Thesis topic: A Context-aware Approach to Creative Computing Toolmaking: Machine Learning-based Meta-Tools for Designers, Architects, and Makers.
- 2015 **The Pennsylvania State University**, University Park, PA.
M.Arch. II, P.P.T.A. in Design Computing, Prof. Daniel Cardoso Llach.
Thesis Topic: Motion Grammar for Robotic Fabrication
- 2012 **School of Architecture, Faculty of Fine Arts, University of Tehran**, Tehran, Iran.
Master of Architecture
Thesis subject: Application and Evaluation of Algorithmic Procedures in Dwelling Projects.
- 2009 **School of Architecture, Faculty of Fine Arts, University of Tehran**, Tehran, Iran.
Bachelor of Architecture

Work Experiences

- 2019 **Autodesk Robotics Lab**, San Francisco, CA, USA.
Robotics Creative Technologist Intern, Autodesk Research, Office of Chief Technology Officer (OCTO).
Researcher on Project Chivo, a Maya Machine Learning-based Plug-in for Robotic Cinematography.
- 2018 **Autodesk BUILD Space**, Boston, MA, USA.
Robotic Construction intern, OCTO.
Developer and designer for Automated Robotic Construction Project, a platform for human-robot collaboration in construction of timber structures.
- 2017 **Autodesk Emerging Technologies**, San Francisco, CA, USA.
Design and Fabrication for AR/VR Intern, OCTO.
Project Manager and Developer at Project *V-Dream*, an Immersive Platform for High Dimensional Solution Space Navigation. Integrating Stingray Platform and Project Dreamcatcher Using Machine Learning Methods.
- 2016 **Autodesk Applied Research Lab**, San Francisco, CA, USA.
Computational Design and Fabrication Intern, OCTO.
Designer at Project *MeshBot*, Collaborative Automated Robotic Fabrication Platform. Integrating Industrial Robotic Arms, Computer Vision, and Computer Aided Manufacturing (CAM).
Designing Robotic End-effectors. Developing Electronic Systems for Robotic End-effectors.
- 2015 **Bentley Systems**, Exton, PA, USA.
Product Management Intern at Generative Component (GC) Team.

Academic Projects/Positions Involved

- 2021-Now **Lead Graduate Instructor**, CMU.
Course Founder and Lead instructor, 48-770 Inquiries to Machine Learning and Design, a Graduate-level Course on the Applications of Machine Learning Generative Models for Designers.
- 2020-2021 **Rethinking Autonomy in Construction**, CMU.
Leading the team of researchers developing a Semi-Autonomous drone construction using reinforcement learning algorithm.
- 2018-2020 **Robotics Fellow**, CMU.
Architectural Robotics Researcher and Instructure.
- 2018-2020 **Robot|Art Research Team**, CMU.
Developing Machine Learning methods for creative application in robotics.
- 2016-2018 **Robotic Plastering Research**, CMU.
Developing computer vision system (hardware and software) for machine-learning based computer vision feedback loops. Under supervision of Josh Bard, CMU dFab.
- 2014-2016 **SALA Robotic Fabrication Lab Initiative Team**, Penn State.

Member of Initiative Team, R.A, with Prof. Daniel Cardoso Llach and Jamie Heiman, The Pennsylvania State University.

2014-2015

Studies on Robotic Hot Wire Cutting, Penn State.

Research project, in collaboration with SALA Fabrication Lab.

Peer-reviewed Publication & Exhibitions

2020

“Towards a Distributed, Robotically Assisted Construction Framework: Using Reinforcement Learning to Support Scalable Multi-Drone Construction in Dynamic Environments”

Association for Computer Aided Design in Architecture Conference 2020, with Zhihao Fang, Yuning Wu, Ammar Hassonjee, and Daniel Cardoso Llach.

2020

“Artistic Style in Robotic Painting; a Machine Learning Approach to Learning Brushstroke from Human Artists”

International Conference on Robot and Human Interactive Communication (RO-MAN), with Manuel Ladron De Guevara, Cinnie Hsiung, Jean Oh, and Eunsu Kang.

2020

“V-Dream: Immersive Exploration of Generative Design Solution Space”

International Conference on Human-Computer Interaction, with Mohammad Keshavarzi and Hans Kellner.

2019

“A Machine Learning Framework for Developing Creativity Support Tools”

International Conference on Computer Creativity 2019, Doctoral Consortium.

2019

“Machinic Surrogacy”

International Symposium on Electronic Arts 2019, with Eunsu Kang, Daniel Cardoso Llach.

2018

“DeepCloud”

Exhibited in the NIPS Creativity Workshop Gallery 2018, with Pedro Veloso.

2018

“DeepCloud: the application of a data-driven generative model in design”

Association for Computer Aided Design in Architecture Conference 2018, with Pedro Veloso.

2018

“Automated Construction”

Autodesk’s Spotlight Lecture Series, Boston, MA.

2018

“Image Classification for Robotic Plastering with Convolutional Neural Network”

Rob|Arch2018, Robotic Fabrication in Architecture, Art, and Design, with Josh Bard, Wei Wei Chi.

2017

“Assisted Automation: Three Learning Experiences in Architectural Robotics”

International Journal of Architectural Computing, with Daniel Cardoso Llach and Shokofeh Darbari.

2016

“Of Hands and Robots: ‘Assisted Automation’ and ‘Robotic Enactments’ in Creative Robotics Pedagogy”

FABLEARN 2016: 6th Annual Conference on Creativity and Making in Education (ACM SIGCHI), with Daniel Cardoso Llach and Shokofeh Darbari, Stanford, CA, U.S.A.

2016

“Robotic Motion Grammar”

Published in the Proceedings of the SimAUD, UCL, London, U.K.

2015

“Towards a Motion Grammar for Robotic Stereotomy”

Published in the Proceedings of CAADRIA 2015, May 2015, with Daniel Cardoso Llach.

Invited Lectures and Reviews

2021

Interfacing Machine Learning Tools for Creative Users, at Center for Augmented Computational Design in Architecture, Engineering and Construction (design++), at ETH University, Zurich (virtual)

2021

Machine Learning and Robotics in AEC, Engineering ArchiTECHure youtube channel

2020

Fake Attention Studio Review, at the Pennsylvania State University, School of Architecture.

2019

Learning Matters on Machine Learning and Robotics, at the Pennsylvania State University, School of Architecture.

2019

STAR-edSolids Third-year Studio Review, at the College of Architecture+ Environmental Design, Kent State University

Honors and Awards

2021

Computational Design Research Support Micro Grant, School of Architecture, CMU.

2018

ACADIA 2018 Conference Travel Grant, Association for Computer Aided Design in Architecture.

2016

Best Project Prize, 15-112 Project Review, School of Computer Science, CMU.

2016

3rd Grand Prize and Best Use of API Prize, 112 Hackathon, CMU.

2016

Full Tuition Waiver and Stipend for PhD Program, CMU School of Architecture.

2015-2016

SCDC Student Research Grant for PhD studies, Penn State.

2015-2016 **Robert Graham Endow Grad Fellowship**, Penn State.
2015 **Architectural Research Centers Consortium (ARCC) King Student Medal**, Penn State.
2015 **Stuckeman School Graduate student travel Grant**, Penn State.
2013-2015 **Full Tuition Waiver and Stipend for Masters' program**, Penn State.

Teaching Experiences

2021-Now **Inquiries into Machine Learning and Design, Lead Instructor**, CMU.
2017-2020 **Introduction to Architectural Robotics, Instructor**, CMU.
2017-2018 **Fundamentals of Computation Design, T.A.**, CMU.
2016 **Inquiry into Computation, Architecture, and Design, T.A.**, CMU.
2016 **Robotic Fabrication Workshop, Tutor**, Penn State.

Peer-Review Contributions

2021 **CAADRIA Conference 2021**, paper reviewer.
2021 **Creativity & Cognition 2021**, poster reviewer.
2020 **HRI Conference**, video reviewer.
2020 **CAADRIA Conference 2020**, paper reviewer.
2019 **ACM SIGGRAPH Conference 2019**, paper and project reviewer.
2019 **Graduate Admission Committee - Master of Computational Design**, board member, CMU.
2016-17 **International Research Journal of Automation in Construction**, paper reviewer.

Skills

Programming Skills:

Programming Languages **Python**
Processing
Arduino
ML Packages **PyTorch**
Keras

Software Skills:

Rhinoceros
Unity
Motive Motion Capture
Adobe Suite
RobotStudio

Hands-on Skills:

Prototyping **3D Print, Laser Cut**
Robotics **ABB, Rotrics**