

Alexandros Haridis

MIT Architecture-Computation, Room 10-303
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RESEARCH INTERESTS

Pedagogy and Applications of Artificial Intelligence; Computational Learning and Interpretability
Geometric Computing and Structural Mathematics; Shape Grammars and Formal Design
Methods; Data Processing and Visualization; Traditional and Contemporary Aesthetics

EDUCATION

- 2022 **Ph.D. in Architecture: Design and Computation**, Department of Architecture
Massachusetts Institute of Technology. GPA: 5.0/5.0
- 2017 **M.S. in Computer Science**, Department of Electrical Engineering & Computer Science
Massachusetts Institute of Technology. GPA: 5.0/5.0
- 2016 **SMArchS in Design and Computation**, Department of Architecture
Massachusetts Institute of Technology. GPA: 5.0/5.0
- 2014 **Diploma Architect-Engineer** (M.Arch. equivalent)
Aristotle University of Thessaloniki. GPA: 9.0/10.0

PUBLICATIONS

Peer-reviewed Journal Articles

- 2022 "Geometry of Point-Line Arrangements Containing Shapes: Mathematical Properties and Applications." **A. Haridis**
Computer-Aided Design Journal [Forthcoming]
- "Analysis of Shape Grammars: Continuity of Rules." **A. Haridis**, George Stiny
Environment and Planning B: Urban Analytics and City Science 49(7): 1929—1948
- 2021 "SHREC'21: Quantifying Shape Complexity." MF Arslan, **A. Haridis**, PL Rosin, S Tari,
C Brasseley, JD Gardiner, A Genctav, M Genctav.
Computers & Graphics 102: 144—153
- 2020 "Structure from Appearance: Topology with Shapes, without Points." **A. Haridis**
Journal of Mathematics and the Arts 14(3): 199—238
- "The topology of shapes made with points." **A. Haridis**
Environment and Planning B: Urban Analytics and City Science 47(7): 1279—1288

Book-length Teaching Notes

- 2018-present *Introduction to Artificial Intelligence: 6.034 Teaching Notes*
 Department of Electrical Engineering and Computer Science, MIT
A. Haridis, P. H. Winston, K. Koile, R. Davis
- Distributed to staff and students of "6.034/6.844 Artificial Intelligence" since Fall 2020.

PhD Thesis

- 2022 *Visual Calculating Aesthetic Value: Formals Models of Description and Evaluation*
 Department of Architecture, Massachusetts Institute of Technology
 Committee: Prof. George Stiny (advisor), Prof. Terry Knight, Prof. Caitlin Mueller

AWARDS AND HONORS

- 2022 **Hyzen Fellowship, Massachusetts Institute of Technology**
 For the last semester of doctoral studies, 2021/2022
- 2019 - 2022 **Onassis Foundation Scholar**
 Awarded to Greek students studying full-time in a doctoral program in the US
- 2018 **Bill Mitchell++ Award, Massachusetts Institute of Technology**
 Awarded for doctoral research in design and computation
- 2017 **Presidential Fellowship, Massachusetts Institute of Technology**
 Awarded to 1 student in the Department of Architecture for doctoral studies in computation
- 2015 - 2017 **AG Leventis Foundation Scholar**
 Two-year Scholarship for full-time master's studies in the US
- 2018 **Graduate Student Council Travel Fund Grant**
 Selected from the MIT Graduate Student Council
- 2016 - 2018 **Avalon Travel Grant**
 Multiple grants awarded for presentation at international conferences
- 2015 **Hyzen Fellowship, Massachusetts Institute of Technology**
 One-semester tuition and stipend for master's research, 2015/2016
- 2015 **Finalist, NASA Centennial Challenge: 3D Printed Habitat**
 Design and construction competition with the Digital Structures Group
- 2015 **Gerondelis Foundation Grant**
 Awarded for master's research at MIT
- 2014 - 2016 **Graduate Fellowship, Massachusetts Institute of Technology**
 Two-year fellowship for master's studies in design and computation
- 2014 **Highest Honors, Diploma Architect-Engineer, AUTH**
 Distinction for graduating in the highest tier from the Department of Architecture
- 2011, 2013 **15th and 16th Biennale of Young Artists, BJCEM**
 Among 15 representative artists from the Mediterranean in Europe

TEACHING EXPERIENCE

- 2016, 2018 **6.034/6.844 Artificial Intelligence**
 Massachusetts Institute of Technology, Department of Electrical Eng. & Computer Science
 Teaching Assistant for Fall 2016 and 2018 (~350 students). *Evaluation Score: 6.8/7.0*
- Taught weekly technical recitations for 60 students, developed original material for quizzes/exams (four per semester), weekly office hours on coding assignments, student advising
- 2017-2021 **4.542/4.581 Proseminar in Computation**
 Massachusetts Institute of Technology, Department of Architecture
 Teaching Assistant for Fall/Spring (~10 MSc and PhD students)
- Led seminar discussions and selection of readings in topical areas of research in computation artificial intelligence, linguistics, literary criticism, aesthetics, design theory
- 2021 **Algorithmic Methods and Computational Learning in Design (SWAP)**
 Massachusetts Institute of Technology, Department of Architecture
 Course Developer for the Summer Work and Pedagogy Program (10 MSc and PhD students)
- Developed a research oriented course to machine learning (classification, unsupervised learning, dimensionality reduction) with an emphasis on spatial design applications
- 2017 **DME100 Research in Design Computation**
 Boston Architectural College, Boston, Massachusetts
 Course Developer and Lecturer, Spring 2017 (8 undergraduate students)
- Introductory course in design computation research and scholarship emphasizing both technical skills-building and historical/intellectual connections with other computing disciplines
- 2014-2020 **Teaching Assistanships for Architecture and Design Studios** (various)
 Massachusetts Institute of Technology, School of Architecture and Planning
- *4.024 Architecture Design Studio II* (~12 undergraduate students), Spring 2020
 Participated in weekly crits, assisted in design idea development for projects related to public infrastructure buildings, material, and fabrication techniques
 - *4.s56 Special Subject in Computation: Superseding Parts/Wholes* (~8 students), Spring 2020
 Graduate computational design and fabrication course. Assisted with homework assignments on parametric design, volumetric modeling, shape studies, and digital fabrication.
 - *4.540 Introduction to Shape Grammars I & II* (~15 students), Fall/Spring 2019-2021
 Prepared and delivered guest lectures on shape algebras, topological descriptions in design, rule-based generative systems, grammatical description of form
 - *MAS.650/4.110 Design Across Scales and Disciplines* (~100 students), Spring 2015
 Interdepartmental design course. Participated in project crits for ten student teams and led creative coding assignments.
 - *4.154 Architecture Design Option Studio* (~12 graduate students), Fall 2014
 Graduate architecture studio on small-scale public structures on Charles river's banks. Led one-on-one sessions and assisted in all stages of project development and delivery.

RESEARCH EXPERIENCE

- 2018-2022 **PhD Researcher, Department of Architecture, Massachusetts Institute of Technology**
Research Topics: Structural Mathematics in Architecture and Design, Geometric Methods of Shape Embedding, Shape Grammars, Rule-Based Evaluation of Aesthetic Qualities
Advisor: Prof. George Stiny
- 06—09/2019 **Research Intern, OPT Industries Inc., Cambridge, MA**
Led research on the efficient representation and transfer of CAD geometry to CNC machines
- 09—12/2016 **Research Assistant, Genesis Group, MIT CSAIL**
Mentor: Prof. Patrick H. Winston
Conducted experimental studies aimed at understanding language-enabled descriptions for envisioning and recreation of 3D spatial configurations
- 06—12/2015 **Research Assistant, Digital Structures Group, MIT Department of Architecture**
Mentor: Prof. Caitlin Mueller
Worked on topics in computer graphics and shape modeling for applications in computational structural design and design space exploration

SELECTED TALKS AND WORKSHOPS

- May 2021 **Eurographics 2021, SHREC'21 Workshop Track on "Quantifying Shape Complexity" for 3D Objects Retrieval**
Workshop track co-organizer
- Dec 2020 **Research Topics in Computation and Design, National Technical University of Athens Post-Graduate Program (virtual)**
Invited speaker
- Jul 2018 **International Conference on Design Computing and Cognition (DCC'18), Politecnico di Milano, Lecco, Italy**
Research paper presenter
- Jan 2018 **International Conference on Design Creativity (ICDC), University of Bath, Bath, UK**
Research paper presenter
- Jan 2018 **International Design Workshop, MIT Computation Group and UAI Design Lab, MISTI-Chile Funded Program**
Workshop co-organizer
- Jul 2016 **International Conference on Design Computing and Cognition (DCC'16), Northwestern University, Chicago, USA**
Selected workshop presenter

SERVICE

- Reviewing **Environment and Planning B: Urban Analytics and City Science** (2019-2021)
Artificial Intelligence for Eng. Design, Analysis and Manufacturing (2019-2021)
Nexus Network Journal (2018-2019)
Design Computing and Cognition (DCC Conference Series) (2018-2022)
- 2021 **Graduate Admissions Committee** (Member), MSc & PhD in Computation, MIT
 2018-2020 **Cabinet Representative** (PhD), Architecture Student Council (ASC), MIT
 2015-2021 **Interdepartmental Subjects Listing Contributor**, Department of Architecture, MIT
- Organization **Co-organizer**, *4.583 Forum in Computation*, MIT Computation Group, Lecture series with invited speakers in topical areas including Computational Design, HCI, Web Development, Machine Learning. Fall/Spring 2017-2018
- Volunteer Instructor**, Development of a Summer Course "Arithmetic with Shapes" for K12 students from the Boston area. MIT Educational Studies Program (ESP), July-August 2017
- Mentoring & Advising Graduate (MArch, SMArchS) students from the MIT Department of Architecture
 Undergraduate (BSc) students from the MIT Departments of Mathematics and EECS.
List of Names available upon request.

OUTREACH & OTHER ACTIVITIES

- Invited Critic **Massachusetts Institute of Technology, Georgia Institute of Technology, Wenworth Institute of Technology, Boston Architectural College, National Technical University of Athens, Aristotle University of Thessaloniki**
- Membership **Association for Computing Machinery**
Association for Computer-Aided Design in Architecture
American Society for Aesthetics
- Pedagogical Training Implicit Bias in Admissions Processes, MIT Institute Community and Equity Office, 2021
 Kaufman Teaching Certificate Program, MIT Teaching + Learning Lab, 2018
- Computer Skills Proficiency in Languages: Python, Processing/Java, TypeScript/HTML, LaTeX
 Design Software: Adobe Suite, Autodesk Rhino/Grasshopper, Autocad, 3DSMax
- Languages Greek (Native)
 English (Fluent)
 Armenian (Conversational, Mother's Language)
 German (Beginner)
- Other
 - Semi-professional electronic music producer and performer. Discography (2009-2015): 4 personal EPs, multiple remixes for other artists, appearances in 5 music compilations (Record releases in Greece, Italy, Norway, Germany)
 - MIT Tennis Club