MOHAMED ISMAIL

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EDUCATION

Massachusetts Institute of Technology, Cambridge MA — Expected December 2022
PhD in Building Technology, Department of Architecture
2020 Paul and Daisy Soros Fellow, 2019 MIT Presidential Fellow

Massachusetts Institute of Technology, Cambridge MA — May 2019
Master of Science in Architecture Studies, Building Technology, Department of Architecture
2017 Fellow of the MIT Tata Center for Technology and Design

University of Virginia, Charlottesville VA — May 2016
Masters of Architecture
2017 UVA Faculty Award for Excellence in Design

Duke University, Durham NC — May 2013
Bachelors of Science in Civil Engineering, Structural Track
Certificate in Architectural Engineering, 2012 Environmental Leadership Award

TEACHING EXPERIENCE

MIT Department of Architecture, co-instructor with Prof. Caitlin Mueller — February to May 2021
ARCH 4.s48, Collaborations in Concrete: Post-colonial Architecture in the Global South
Co-taught research seminar examining historic concrete architecture in the Global South, directed student research projects on non-western designers, coordinated public symposium as part of school lecture series.

MIT Department of Architecture, co-instructor with Lavender Tessmer — January 2022
ARCH 4.s45, Designing Concrete: Performance and Aesthetics of Cementitious Mixes
Directed workshop on experimental concrete mix design through material exploration using rigorous scientific methods, literature review, and qualitative analysis.

MIT Department of Architecture, teaching assistant to Prof. John Ochsendorf — January 2022
ARCH 4.462, Introduction to Structural Design
Organized weekly lab sessions, office hours, and supplementary materials for graduate architecture students learning structural design through analog and digital methods.

Northeastern University CAMD, part-time lecturer — August to December 2020
ARCH 2240, Architectectonic Systems
Developed course in architectural tectonics in close collaboration with other faculty, teaching the history of common building systems and how they are put in use today.

UVA School of Architecture, faculty lecturer — July 2016 to June 2017
ARCH 3270/6270, Parametric Structural Design
Developed a course and lectured in parametric structural design, teaching the history of structural systems and their potential in contemporary design thinking.

UVA School of Architecture, faculty lecturer July 2016 to June 2017
SARC 5555, Workflows
Instructed a course in architectural design workflows, teaching visualization techniques, and critical thinking in design representation while exploring additional tools of communication.

UVA SARC, design teaching fellow June 2015 to May 2016
ARCH 2020, Collective Housing: Re-Housing the American Dream
Designed visualization curriculum for second-year undergraduate architecture students while providing teaching assistance and supplementary material for studio work and guidance to other graduate TAs.

UVA Summer Design Institute, teaching assistant July to August 2015
Taught newly admitted graduate students in architecture, urban planning, and landscape architecture skills in design thinking, visualization, and communication skills in preparation for the respective program.

UVA SARC, research assistant to Prof. Jeana Ripple June 2014 to present
Explored the potential applications for nonlinear structural analysis software in the architectural design phase, applying parametric tools and instantaneous analysis to catalyze the latent role of structural principles in design.

UVA SARC, teaching assistant to Benjamin Hays and Prof. Kirk Martini January 2014 to May 2015
ARCH 2240/6240, Introduction to Structural Design
Assisted students on homework problems, held office hours, scheduled tutorials, and coordinated lab sessions focusing on structural design processes and problem solving.

PROFESSIONAL EXPERIENCE

Gensler, Houston TX, Summer Intern June to August 2015
Prepared presentation elevations and proof-read and corrected construction documents for clarity and code assessment. Diagrammed and developed a narrative of a large-scale campus project for publication with the architects involved.

Duda Paine Architects, Durham NC, Winter Intern January 2014
Constructed presentation model for competition entry with a team of architectural interns and input from the principal architects.

PUBLICATIONS

Peer-Reviewed Journal Articles

M. A. Ismail and C. T. Mueller, "Minimizing embodied energy of reinforced concrete floor systems in developing countries through shape optimization," *Engineering Structures*, vol. 246, p. 112955, Nov. 2021, doi: 10.1016/j.engstruct.2021.112955.

M. A. Ismail, P. L. Mayencourt, and C. T. Mueller, "Shaped beams: unlocking new geometry for efficient structures," *Architecture, Structures and Construction*, Sep. 2021, doi: 10.1007/s44150-021-00003-y.

Peer-Reviewed Conference Papers

J.M. Broyles et al., "Shape optimization of concrete floor systems for sustainability, acoustical, and thermal objectives," presented at the International Conference on Structures and Architecture, Aalborg, Denmark, Jul. 2022.

M. A. Ismail, G. Sorrento, C. Daniel, and C. T. Mueller, "Immersive Design of Exposed Optimized Structural Systems," in *IASS Annual Symposium 2020/21 and the 7th International Conference on Spatial Structures*. Guilford, UK, 2021.

M. A. Ismail and C. T. Mueller, "Low-carbon Concrete Construction: The past, present, and future of concrete design in India," in 2020 *AIA/ACSA Intersections Research Conference: CARBON*, 2020.

M. A. Ismail, C. T. Mueller, "Engineering a New Nation: Mahendra Raj and his collaborations across disciplines" *107th Annual Meeting of the ACSA*. Pittsburgh PA, 2019.
M. A. Ismail, C. T. Mueller, "A Platform of Design Strategies for the Optimization of Concrete Floor Systems in India" *International Conference on Structures and Architecture.* Lisbon, Portugal, 2019.

M. A. Ismail, C. T. Mueller, "Computational Structural Design and Fabrication of Hollow-Core Concrete Beams" *Proceedings of the IASS Symposium*, 2018. Cambridge MA, 2018.

M. A. Ismail, "Resistance Through Form: Masonry Synthesis Structures in the Design of a New Residential Architecture for Khartoum, Sudan" *106th Annual Meeting of the ACSA*, 2018. Denver CO, 2018.

Theses

M. A. Ismail, "Reshaping concrete: Empowering development through low-carbon structures," PhD in progress, MIT, advised by Caitlin Mueller. Cambridge MA, anticipated December 2022.

M. A. Ismail, "Materially Efficient Structural Floor Systems for Housing in India," Master of Science in Architectural Studies, MIT, advised by Caitlin Mueller. Cambridge MA, 2019.

M. A. Ismail, "Resistance Through Form: Masonry Synthesis Structures in the Design of a New Residential Architecture for Khartoum, Sudan" Master of Architecture, UVA, advised by Jeana Ripple. Charlottesville VA, 2017.

INVITED LECTURES AND WORKSHOPS

MIT, Building Technology: Structures and Envelopes, instructor: Caitlin Mueller 2019-2021

University of Arkansas, Structures 1, instructor: Emily Baker 2020-2021
Concrete beam design, digital fabrication, and structural load testing workshop.

Northeastern University, Architecture Case Studies, instructors: Jeremy Munn 2021-2022

Northeastern University, Architectonics, instructors: Peter Wiederspahn, Paxton Sheldahl 2020

MIT, D-Lab: Schools – Building Technology Laboratory, instructor: Leslie Norford 2019
Shaped concrete beam design and structural load testing workshop.

MIT Tata Symposium, multiple research poster presentations 2018-2019
"Low-cost, low-carbon structural elements for housing in India" research poster.

LEADERSHIP AND SERVICE

Service to Department of Architecture, MIT

Student Representative, Department Strategy & Equity Committee October 2021 to present
National Org. for Minority Architecture Students, MIT, co-chair August 2019 to August 2020
NOMAS MIT, Executive committee member August 2018 to present
MIT Building Technology admissions committee December 2020 to February 2021
MIT Architecture Student Council, PhD representative August 2018 to August 2019
MIT SA+P, search committee member October 2020 to January 2021
Search committee for Assistant Dean for Diversity, Equity, Belonging, and Student Support.

Service to MIT and local community

MIT Graduate Student Transitional Support Committee April 2021 to present
MIT Graduate Resident Advisor, MacGregor House July 2020 to present
MIT Summer Research Program, pod leader June 2021 to August 2021
MIT Office of Graduate Education, GradCatalyst panelist and coordinator January 2018 to present
MIT Office of Graduate Education, Graduate Diversity Ambassador October 2017 to present
MIT Museum, 3DP bridge workshop for children, technology and support August 2019 to present
MIT Museum, Girl's Day, structural design workshop for children March 2019
MIT mentor, undergraduate research program January 2018 to present
Graduate mentor to students in architecture, civil engineering and mechanical engineering.

Service to profession

Panelist, NASEM Public Summit on Preventing Sexual Harassment in Higher Education 2021
Reviewer, Technology | Architecture + Design Journal 2020-2021
Reviewer, ACSA/AIA Intersection conference 2021
Guest studio critic at MIT, UVA, Northeastern, Hofstra, UIUC, UArk, MassArt, BAC 2016 to present

AWARDS AND HONORS

Fellowships and academic awards

ACSA Diversity Achievement Award, with Prof. Caitlin Mueller — January 2022
Paul and Daisy Soros Fellow — August 2020 to present
MIT Presidential Fellow — August 2019 to present
MIT Tata Center for Technology and Design, Fellow — August 2017 To May 2019
MIT School of Architecture, Design Education Fellow — August 2015 To May 2016
UVA Faculty Award for Excellence in Design — May 2016
Duke University, Environmental Leadership Award, Individual — January 2012

Design competitions

IASS 2021 Pavilion Competition, honorable mention — August, 2021
Pluma, designed in collaboration with Caitlin Mueller, Paul Mayencourt, Eduardo Gascon Alvarez, Ramon Weber, and Demi Fang.

Beebreeders, Guaja Footbridge Competition, honorable mention — July 2019
Transience, designed in collaboration with Paul Mayencourt.

Shelter Global Dencity Design Competition, 2017, honorable mention — March 2017
Resistance Through Form, the Design of a New Residential Architecture for Khartoum, Sudan.

AIA DC Unbuilt Award, merit award — April 2016
Collecting the World (as we know it), a Museum of Mapping.