



DISHITA TURAKHIA

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SUMMARY

My research is at the intersection of **Human-Computer Interaction** and **Learning Science**. I **design, build, and study interventions for learning physical skills**, such as motor and makerskills. I have 5+ years of work experience in the industry working as a researcher, computational designer, and licensed architect. [US work authorization (STEM-OPT)]

EDUCATION

- | | |
|---|-----------------------------|
| Massachusetts Institute of Technology | <i>Cambridge, MA, USA</i> |
| Doctor of Philosophy (Ph.D.) in Electrical Engineering and Computer Science | <i>2018-2024 (expected)</i> |
| Minor in Brain and Cognitive Science | |
| <ul style="list-style-type: none"> Thesis: Designing learner-centric tools for skill learning Advisors: Prof. Stefanie Mueller & Prof. Kayla DesPortes | |
| Massachusetts Institute of Technology | <i>Cambridge, MA, USA</i> |
| Master of Science (M.Sc.) in Electrical Engineering and Computer Science (Dual Degree) | <i>2015- 2017</i> |
| Master of Science in Architectural Studies (S.M.Arch.S.) in Design Computation | |
| <ul style="list-style-type: none"> Thesis: A theoretical inquiry in computational creativity Advisors: Prof. Patrick Winston & Prof. George Stiny | |
| Architectural Association School of Architecture | <i>London, UK</i> |
| Master of Science (M.Sc.) in Emergent Technologies and Design (EmTech) | <i>2009- 2011</i> |
| <ul style="list-style-type: none"> Thesis: Generative design of dynamic tensegrity systems for reconfigurable living spaces | |
| Mumbai University-Kamla Raheja Vidhyanidhi Institute of Architecture (KRVIA) | <i>Mumbai, India</i> |
| Bachelor of Architecture (B.Arch.) | <i>2003- 2008</i> |
| <ul style="list-style-type: none"> Thesis: Designing for Rehabilitation of Tribal Communities in Gujrat | |

RESEARCH EXPERIENCE

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|---|----------------------------|
| MIT Computer Science Artificial Intelligence Laboratory (CSAIL) | <i>Cambridge, MA, USA</i> |
| <i>Research Assistant</i> | <i>2018 - present</i> |
| <ul style="list-style-type: none"> Adaptive learning of motor skills project: developed and studied prototypes, algorithms, and the user interface (UI) to design and build the adaptive training tools for learning motor skills; published findings [5,6,12] Game-based learning of fabrication skills project: Led research collaboration with NYU to develop a toolkit utilizing computer vision to integrate fabrication activities into games for middle school students; conducted qualitative studies with educators, analyzed the data to identify key learning goals; published the findings [7,9,10] Reflection-based learning of makerskills project: designed and implemented a framework to prompt self-reflection during maker activities using AR and VR; studied its impact on skill learning; published the findings [11,13] | |
| Design Lab, University of California San Diego | <i>San Diego CA, USA</i> |
| <i>Visiting Researcher</i> | <i>Jan 2023 - May 2023</i> |
| <ul style="list-style-type: none"> Led the team researching the use of Large Language Models (LLMs) to generate reflection-based instructional tutorials for learning makerskills; also collaborated with Boston University; articulated the findings [13] | |
| Meta Reality Labs Research | <i>Redmond, WA, USA</i> |
| <i>Research Intern</i> | <i>May 2022 - Dec 2022</i> |
| <ul style="list-style-type: none"> Developed and implemented the pipeline for learning motor skills in Augmented Reality (AR); led the engineering team to prototype a HoloLens app for training; conducted user studies, & articulated results in a paper [12] | |
| Singapore University of Technology and Design (SUTD) | <i>Singapore</i> |
| <i>Computational Design Researcher</i> | <i>Apr 2015 - Aug 2015</i> |
| <ul style="list-style-type: none"> Fabricated prototypes for testing the structural integrity of sheet metal assemblies, published the findings [3] | |

CONFERENCE & JOURNAL PUBLICATIONS

- [13] **D. Turakhia**, Z. Mroue, P. Jiang, S. Mueller. "Reflectables: Using Generative AI to Integrate Reflection Prompts for Makerskills within Instructable Tutorials" (*Under review*)
- [12] **D. Turakhia**, M. Parent, M. Glueck, T. Grossman, B. Lafreniere "Motor Skill-Learning in Augmented Reality: Studying the Challenges and Opportunities in the Design of Adaptive Training Tools. (*Under review*)
- [11] H. Lie, K. Studer, Z. Zhao, B. Thompson, **D. Turakhia**, and J. Liu. "Training for Open-Ended Drilling through a Virtual Reality Simulation" *In Proceedings for International Symposium for Mixed and Augmented Reality (IEEE ISMAR'23)*
- [10] **D. Turakhia**, D. Ludgin, S. Mueller, K. DesPortes. "Understanding the Educators' Practices in Makerspaces" *In Journal of Educational Technology Research and Development (ETRD '23)*
- [9] **D. Turakhia**, S. Mueller, K. DesPortes. "Identifying Game Mechanics for Integrating with Fabrication Activities in Existing Digital Games" *In Proceedings for Conference on Human Factors in Computing Systems (ACM CHI'22)*
- [8] Y. Kim, J. Zhu, M. Trivedi, **D. Turakhia**, N. Wu, D. Ko, M. Wessely, S. Mueller "SensorViz: Visualizing Sensor Data Across Stages of Prototyping Interactive Objects" *In Proceedings for Conference on Designing Interactive Systems (ACM DIS'22)*
- [7] **D. Turakhia**, H. Allen, K. DesPortes, S. Mueller. "FabO: Integrating Fabrication with a Player's Gameplay in Existing Digital Games" *In Proceedings for Conference on Creativity and Cognition (ACM C&C'21)*
- [6] **D. Turakhia**, Y. Kim, Q. Yi, L. Blumberg, A. Wong, S. Mueller. "Adapt2Learn: A Toolkit for Configuring the Learning Algorithm for Adaptive Motor-Skill Training" *In Proceedings for Conference on Designing Interactive Systems (ACM DIS'21)*
- [5] **D. Turakhia**, Q. Yi, L. Blumberg, A. Wong, S. Mueller. "Can Physical Tools that Adapt their Shape based on a Learner's Performance Help in Motor-Skill Training?" *In Proceedings for Conference on Tangible Embedded Interfaces (ACM TEI'21)*
- [4] **D. Turakhia**. "Spatial Cognition: Significance of Scientific Aspects in Architectural Design." *In Proceedings for Conference on Association of Neuroscience For Architecture (ANFA'16)*
- [3] M. Budig and **D. Turakhia** "Crafting Skins" *In Journal of Association for Architectural Education (AAE'16)*
- [2] **D. Turakhia** "Dynamic Tensegrity Structures" *In Proceedings for Conference on Association for Computer-Aided Architectural Design Research in Asia (CAADRIA'13)*
- [1] **D. Turakhia** "Generative Algorithm for Non-regular Dynamic Tensegrity Systems" *In Proceedings for Conference on Shape Modeling International (SMI'13)*

WORKSHOPS, POSTERS, & DEMOS

- [P4] **D. Turakhia**, S. Mueller, K. DesPortes. "What Can We Learn From Educators About Teaching in Makerspaces?" *In Conference on Human Factors in Computing Systems Extended Abstracts (ACM CHI EA'23)*
- [P3] **D. Turakhia**, P. Jiang, S. Mueller "The Reflective Make-AR In-Action: Using Augmented Reality for Reflection-based Learning of Makerskills" *In Conference on Human Factors in Computing Systems Extended Abstracts (ACM CHI EA'23)*
- [P2] **D. Turakhia**. "Designing Tools for Autodidactic Learning of Skills" *In Adjunct Proceedings of Symposium on User Interface Software and Technology (ACM UIST'22)*
- [P1] **D. Turakhia**, P. Jiang, B. Liu, M. Leake, S. Mueller. "The Reflective Maker: Using Reflection to Support Skill-learning in Makerspaces" *In Adjunct Proceedings of Symposium on User Interface Software and Technology (ACM UIST'22)*
- [W1] **D. Turakhia**, P. Blikstein, N. Holbert, M. Worsley, J. Jacobs, F. Anderson, J. Gong, K. DesPortes, S. Mueller "Reimagining Systems for Learning Hands-on Creative and Maker Skills" *In Conference on Human Factors in Computing Systems Extended Abstracts (ACM CHI EA'22)*
- [D1] **D. Turakhia**, Y. Kim, Q. Yi, L. Blumberg, A. Wong, S. Mueller. "Designing Adaptive Tools for Motor Skill Training" *In Adjunct Proceedings of Symposium on User Interface Software and Technology (ACM UIST'21)*

FELLOWSHIPS & AWARDS

- **Meta (Facebook) Ph.D. Fellowship**, AR/VR category (Awarded to top 1.5% from 2300+ applicants) 2022
- **EECS Rising Stars, HCI research** 2022
- **MIT Social and Ethically Responsible Computing (SERC) Fellow** 2022
- **MIT Edwin S. Webster Fellowship**, MIT EECS (awarded to top-performing women graduate students) 2018
- **Grace Hopper Student Scholarship** 2018
- **Bill Mitchel Graduate Fellowship**, (dept. of Architecture, MIT) 2017
- **MIT Research Assistant Fellowship**, (dept. of Architecture, MIT) 2016

AWARDED GRANTS (Co-written with my PI, a total of \$2 million+ in funding raised for my research projects)

- **MIT J-WEL Education Innovation Grants** (\$100k) 2023
- **MIT Integrated Learning Initiative** (\$150k, \$250k, \$250k) 2018, 2019, 2022
- **MISTI-Germany Grant** (\$30k) 2019
- **Microsoft Faculty Fellowship** (\$200k) 2020
- **NSF Career Small** (\$300k) 2019
- **MIT.Nano** (\$200k) 2018
- **NSF Career** (\$500k) 2018
- **MISTI-Chile Grant** 2016

INVITED TALKS

- **Samsung Research America**, Topic: Designing learner-centric systems for skill-learning 2023
- **HarvardX**, Topic: Adaptive Learning of Motor Skills 2020
- **MIT Integrated Learning Initiative xTalks**, Topic: Adaptive Learning of Motor Skills 2019
- **TEDx Beacon St**, Topic: Can Computers Think Creatively? 2018
- **Salk Institute, ANFA conference**, Topic: Scientific Aspects of Spatial Cognition in Architecture 2016

PRESS

- **MIT CSAIL News** | Game-based learning project
- **MIT News, Digital Trends, ACM News, Innovation Toronto, Science Wiki, TechXplore, Interesting Engineering, News Atlas, Northern Territory Technology News, News8Plus** | Adaptive Learning of Motor Skills project

PROFESSIONAL EXPERIENCE

Architecture Buro *Mumbai, India*
Principal Architect and Computational Designer 2012- 2015

- Led design and implementation teams for 2 housing architectural design projects and 5 interior design projects

SP+A *Mumbai, India*
Project Architect and Computational Designer 2011- 2012

- Computational design lead for 4 architecture and 2 interior projects. Worked on sensor-based responsive building facade design

PLP Architects *London, UK*
Project Architect and Computational Designer 2010- 2011

- Built parametric designs for architectural projects in London, Abu Dhabi, and China, including two award-winning projects

BSR Architekten *Bern, Switzerland*
Architect Intern 2009- 2010

- Concept design and master planning for winning competition project in Dossenhuette

Ranjit Sinh Associates *Mumbai, India*
Architect Intern 2008

- Design and urban planning for educational institute projects in Bhutan

TEACHING EXPERIENCE

MIT School of Engineering

Cambridge, MA, USA

Teaching Assistant, Course: 6.034/6.084 - Artificial Intelligence

2021 Fall

- Taught recitations to 20+ students (from 250+ enrolled), head TA for the grad version of the course on AI & Ethics

Teaching Assistant, Course: 6.928 - Leading Creative Teams

2020 Fall

- Guided students on team building and creative problem-solving skills

Teaching Assistant, Course: 6.810 - Engineering Interactive Technologies

2018 Fall

- Advised 25+ students on prototyping interactive hardware using sensor-actuators for adaptive learning

MIT Schwarzman College of Computing

Online

Online Learning Facilitator, Course: AI and Automation for Enterprise

2021- 2022

- Led discussions with 50+ participants on state-of-the-art research on ethics and human-centered AI in industry

Online Learning Facilitator, Course: Human-Computer Interaction for User Experience Design

2017

- Taught design theories and application strategies for UX design to 50+ course participants

Aalto University

Helsinki, Finland

Workshop organizer and tutor

2018

- Invited to lead a workshop for 15 masters students on building tools for spatial design using AR/VR

Mumbai University

Mumbai, India

Workshop organizer and tutor

2011- 2014

- Taught parametric design and software to a class of 40 undergraduate students. Built a pavilion structure in a workshop of 20+ undergraduate design students.

Social and Ethical Responsibilities in Computing (SERC)

Cambridge, MA, USA

Fellow

Jan 2022 - May 2022

- Developed the ethics curriculum for MIT's popular course on Machine Learning (6.083)

Global Startup Labs (GSL)

Mauritius

Design Lead Instructor

Summer 2017

- Developed and led the course on design for entrepreneurship and building startups for 40+ participants

TEACHING CERTIFICATION

MIT Kaufman Teaching Certification Program (KTCP)

2017

- Key skills learned: Developing new curriculum, course material, effective teaching techniques, training for teaching active learning

MENTORING EXPERIENCE

Ph.D. students: led research collaboration and co-authored publications with 2 junior Ph.D. students (at MIT and UCSD)

Master's students: supervised master's thesis, co-authored publications, and mentored three master's graduate students in academic research at MIT

Undergraduate students: mentored 15 undergraduate students at MIT and one student at Boston University for their undergraduate research program (UROP) projects and co-authored publications with 12.

CONFERENCE SERVICE

- **Associate chair:** TEI'23, C&C'23, DIS'23
- **Session chair:** C&C'21, C&C'23
- **Workshop Organizer:** CHI'22 workshop in Reimagining Learning: led the day-long workshop with 4 professors and 2 research scientists, attended by 12 professors and 19 graduate students
- **Reviewer:** CHI'21-'24, UIST'20-'23, DIS'21-'23, TEI'21-'23, ERTD'23, C&C'23, TOCHI'19-'23, CSCW'22, IUI'18, CHI-PLAY'18

LEADERSHIP & OUTREACH VOLUNTEERING

MIT School of Engineering

Cambridge, MA, USA

Committee Member, **EECS Committee of Diversity Equity and Inclusion (EECS CDEI)**

Spring 2022

- Assessed the Ph.D. graduate admissions process and contributed to the roadmap for improving the representation of applicants from underrepresented groups and universities in the EECS Ph.D. program

Mentor, **EECS Graduate Admission Assistance Program (EECS GAAP)**

Fall 2021

- Mentored applicants from underrepresented groups in developing their application package for Ph.D. programs

Fellow, **Science Diversity, Equity, and Inclusion**

Spring 2020

- Led remote social events during the pandemic to spread awareness about DEI initiatives for graduate students

Invited Speaker, **CodeIT**

Fall 2019

- Invited to share my research with middle school girls and non-binary students at CodeIT

Committee Member, **Graduate Women of Course 6 (GW6)**

Fall 2019

- Organized summit on Academic Research and monthly events for EECS graduate women at MIT

Committee Member, **New England Graduate Women in STEM Engineering (NEGWISE)**

Summer 2019

- Organized a day retreat on Diversity for graduate women in Harvard, MIT, Brown University, Boston University, Northeastern University, Brandeis University

Student Member, **MIT EECS Visiting Committee**

Spring 2019

- Recommended improvements for graduate women's physical and mental health at EECS

Conference Committee Member, **Graduate Women at MIT (GWAMIT)**

Spring 2019

- Organized a fall conference on leadership and conducted workshops on giving TEDx talks

Speaker Catalyst Volunteer, **TEDx Boston '18, '19, '20 and TEDxMIT '19**

2018 - 2020

- Advised various speakers including Turing Awardee Dr. Barbara Liskov with their TEDx talks

Volunteer Instructor, **Canopy Tree Afterschool Training**

Fall 2017

- Volunteered to mentor middle school students interested in startups and entrepreneurship, and taught them ideation, market research, and pitching demos to middle school students on their start-up ideas

LEADERSHIP CERTIFICATION

GEL - Gordon Engineering Leadership Program, MIT

Cambridge, MA, USA

- Key skills learned: Leading research teams, conflict management, negotiating disputes effectively

REFERENCES

Prof. Stefanie Mueller

Associate Professor,
School of Engineering,
Massachusetts Institute of Technology
stefanie.mueller@mit.edu

Prof. Kayla DesPortes

Assistant Professor,
School of Engineering,
New York University
kd90@nyu.edu

Dr. Ben Lafreniere

Research Scientist,
Meta Reality Labs Research,
Meta
ben.lafreniere@gmail.com

Prof. Tovi Grossman

Associate Professor,
School of Engineering,
University of Toronto
tovi@chaldecott.ca

Prof. George Stiny

Professor,
School of Architecture and Planning,
Massachusetts Institute of Technology
stiny@mit.edu