Alex Mazursky (he/him)

PhD Student at the University of Chicago
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ABOUT ME

I engineer new technology, from circuits to mechanisms to applications. **I love learning and building fast**.

My PhD research focused on **designing wearable devices that provide tactile feedback** (touch sensations), transforming otherwise passive objects and surfaces into interactive experiences. I specialize in **engineering haptic actuators from the ground up**, and integrating actuators into custom devices that create diverse sensations—such as vibration, friction, pressure, and temperature—to **augment physical and virtual spaces (AR/VR)**.

My multidisciplinary background in mechanical engineering and computer science supports **designing and implementing systems from the fundamental mechanics to the end application**. I have been privileged to pursue these projects at places like the **University of Chicago, Meta (Reality Labs), and KAIST**.

EDUCATION

University of Chicago **2019 – Expected: Spring 2025**
PhD (& MS) in Computer Science
Advisor: Prof. Pedro Lopes, Human Computer Integration Lab

Miami University **2019**
MS in Mechanical Engineering
Advisor: Prof. Jeong-Hoi Koo, Smart Materials Lab
*Supported by a **Graduate Fellowship from NASA** (Ohio Space Grant Consortium)*

Miami University **2018**
BS in Mechanical Engineering, Energy Co-Major GPA: 3.92/4.00
Summa Cum Laude, Departmental and University Honors

CONFERENCE PUBLICATIONS

Conferences (e.g., CHI, UIST, VR, etc.) are generally regarded as the top-tier publications in Human Computer Interaction (20-25% acceptance rate), even when considering journals (CS is a conference-based field).

Key Publications from PhD Thesis (Fully Refereed)

[C.7] Stick&Slip: Altering Fingerpad Friction via Liquid Coatings
Alex Mazursky, Jacob Serfaty, Pedro Lopes
In Proc. ACM CHI 2024, with demo at IEEE Haptics Symposium.

[C.6] ThermalGrasp: Enabling Thermal Feedback even while Grasping and Walking
Alex Mazursky, Jas Brooks, Beza Desta, Pedro Lopes
In Proc. IEEE VR 2024.

[C.5] ThermalRouter: Enabling Novices to Design Thermally-Sound Devices
Alex Mazursky, Borui Li, Shan-Yuan Teng, Dasha Shifrina, Joyce Passananti, Svitlana Midianko, Pedro Lopes
In Proc. ACM UIST 2023.

[C.4] MagnetIO: Passive yet Interactive Soft Haptic Patches Anywhere
Alex Mazursky, Shan-Yuan Teng, Romain Nith, Pedro Lopes
In Proc. ACM CHI 2021, with demos at CHI and SIGGRAPH Emerging Technologies.

Additional first-author conference paper currently under review focused on wearable wireless power transfer to power battery-free devices.

Additional Conference Publications (Fully Refereed)

[C.3] Augmented Breathing via Thermal Feedback in the Nose
Jas Brooks, **Alex Mazursky**, Janice Hixon, Pedro Lopes
In Proc. ACM UIST 2024., with demo at UIST.

[C.2] Physical Touch from a Robot Caregiver: Examining Factors that Shape Patient Experience
Alex Mazursky, Maddie DeVoe, Sarah Sebo
In Proc. IEEE RO-MAN 2022.

[C.1] Multiphysics Modeling and Parametric Analysis of an Inductor for Heating Thin Sheet Materials
Alex Mazursky, Hee-Chang Park, Sung-Hyuk Song, Jeong-Hoi Koo
In Proc. ASME International Mechanical Engineering Congress & Exposition (IMECE) 2018.

JOURNAL PUBLICATIONS

[J.4] A Stretchable and Strain-insensitive Pressure Sensor for Accurately Digitizing the Sensation on Human and Robotic Skins
Qi Su, Yang Li, Yuzhen Chen, Shan-Yuan Teng, Jane Tunde Kelleher, Romain Nith, Ping Cheng, Nan Li, Wei Liu, Shilei Dai, Youdi Liu, **Alex Mazursky**, Jie Xu, Lihua Jin, Pedro Lopes, Qiang Zou, Sihong Wang
Science Advances 2021.

[J.3] Design and Experimental Evaluation of an Electrorheological Haptic Module with Embedded Sensing
Alex Mazursky, Jeong-Hoi Koo, Taylor Mason, Sam-Yong Woo, Tae-Heon Yang
Applied Sciences 2021, SI: Haptics: Technology and Applications. **Feature Paper**.

[J.2] A Compact and Compliant Mixed Mode Electrorheological Actuator for Generating a Wide Range of Haptic Sensations
Alex Mazursky, Tae-Heon Yang, Jeong-Hoi Koo
Smart Materials and Structures 2020.

[J.1] Design, Modeling, and Evaluation of a Slim Haptic Actuator based on Electrorheological Fluid
Alex Mazursky, Jeong-Hoi Koo, Tae-Heon Yang
Journal of Intelligent Material Systems and Structures 2019.

RESEARCH EXPERIENCE

University of Chicago, Department of Computer Science Aug 2019 – Present
Graduate Research Assistant *Chicago, IL*

- ▷ Engineering haptic actuators and wearables from the ground up to integrate new sensations into daily life & AR/VR
- ▷ Developing actuators using technologies such as soft magnetic materials, wireless power transfer & microfluidics
- ▷ Design & test custom hardware solutions including miniaturized PCBs (microcontrollers, motor drivers, wireless)
- ▷ Performing technical evaluations and psychophysical studies to characterize new devices & user experiences
- ▷ Lead focused, interdisciplinary teams to develop compelling applications and software for demoing devices
- ▷ Communicating research through papers (publishing in the best venues in my field), videos, talks, and demos

Meta, Reality Labs Research June 2023 – Oct 2023
Haptics Research Scientist Intern *Redmond, WA*

- ▷ Designed, prototyped and manufactured a bistable electromagnetic actuator with greater force, greater displacement, and faster response time than the state-of-the-art—now part of team's portfolio of actuation technologies
- ▷ Characterized electromechanical performance of the actuator with custom jigs and DAQ programming

Miami University, Department of Mechanical Engineering Feb 2016 – May 2019
Under/Graduate Research Assistant *Oxford, OH*

- ▷ Designed, fabricated and tested a variable stiffness actuator based on electrorheological fluids
- ▷ Analytically modeled actuator's performance based on soft material, fluid, and electrostatic mechanics

Korea Advanced Institute of Science and Technology (KAIST) May 2018 – Aug 2018
Visiting Student Researcher *Daejeon, South Korea*

- ▷ Developed COMSOL multiphysics models of a new induction heating coil geometry for thin sheet workpieces, in collaboration with the Korea Institute of Machinery and Materials (KIMM)

Korea Advanced Institute of Science and Technology (KAIST) Jun 2017 – Jul 2017
Senior Capstone Research *Daejeon, South Korea*

- ▷ Designed applications for a tablet with novel electrostatic haptic actuators, in collaboration with the Korea Research Institute of Standards and Science (KRISS)

SKILLS

Mechanical: Design, Rapid prototyping & 3D printing, Mechanical testing (e.g., dynamic mechanical analysis, fixturing), CAD (Solidworks), Modeling (analytical) & simulation (Comsol), Smart & soft materials, Thermal & heat transfer, Machining (lathe & mill), GD&T

Electrical: Microcontrollers, Printed circuit boards (KiCAD), Signal processing, Controls, Electromagnetics

Human-Computer Interaction: Haptics, AR/VR, Perceptual experiments, Digital fabrication, Interaction design/usability

Programming: Python, C/C++, Matlab, Unity, Applied machine learning, Linux

SHORT PUBLICATIONS, WORKSHOP PAPERS & ABSTRACTS

[A.6] Democratizing Soft Magnetic Materials Fabrication
Alex Mazursky, Pedro Lopes
Actuated Materials and Soft Robotics Strategies for Human-Computer Interaction Design. Workshop at CHI 2022.

[A.5] Smell & Paste: Low-Fidelity Prototyping of Olfactory Experiences
Jas Brooks, **Alex Mazursky**, Yudai Tanaka, Pedro Lopes
Toolkits & Wearables:Developing Toolkits for Exploring Wearable Designs (TOWEAR). Workshop at CHI 2022.

[A.4] Soft Magnetic Actuators for Wearable Tactile Feedback
Alex Mazursky, Shan-Yuan Teng, Romain Nith, Pedro Lopes
MRS Fall Meeting 2020. Symposium on Materials and Mechanics Challenges in Haptics.

[A.3] Incorporating Sensing Capability in an Electrorheological Haptic Module
Alex Mazursky, Tae-Heon Yang, Sam-Yong Woo, Jeong-Hoi Koo
In Proc. International Conference on Adaptive Structures and Technologies (ICAST) 2019.

[A.2] Application of Electro-Rheological Fluids for Conveying Realistic Haptic Feedback
Alex Mazursky, Jeong-Hoi Koo, Tae-Heon Yang
In Proc. International Conference on Adaptive Structures and Technologies (ICAST) 2018.

[A.1] Experimental Evaluation of a Miniature Haptic Actuator based on Electrorheological Fluids
Alex Mazursky, Tae-Heon Yang, Jeong-Hoi Koo
In Proc. SPIE Smart Structures and Nondestructive Evaluation 2018.

DEMOS AT CONFERENCES

[D.4] Augmented Breathing, ACM UIST 2024

[D.3] Stick&Slip, IEEE Haptics Symposium 2024

[D.2] MagnetIO, ACM SIGGRAPH 2021

[D.1] MagnetIO, ACM CHI 2021

WORKSHOPS ORGANIZED

[W.1] Soft Robotics and Actuated Materials for Human-Computer Interaction, ACM DIS 2023

HONORS & AWARDS

Chicago Materials Research Center (MRSEC) SEED Grant, University of Chicago, 2021–2022
$24,500 grant for "Enabling End-Users to Customize Active Materials using a CAD Assistant," with Pedro Lopes

Center for Data and Computing (CDAC) Doctoral Fellowship, University of Chicago, 2019–2020
$2,500 grant for "Health Monitoring Based on Wearable Sweat Sensors," with Pedro Lopes and Sihong Wang

Biochips Travel Grant, University of Colorado Boulder, 2019
$500 travel award to attend Biochips Summer School

Daniels Fellowship, University of Chicago, 2019–2020
$8,000 award for select incoming doctoral students

NASA/OSGC Fellowship, Ohio Space Grant Consortium, 2018–2019
$16,000 award and tuition waiver for my MS Thesis

Provost's Student Academic Achievement Award, Miami University, Fall 2017
Given to select students from the university who have "demonstrated outstanding academic excellence and have made notable contributions to their department." 10-15 awards per year across entire undergraduate student body.

NASA/OSGC Undergraduate STEM Scholarship, Ohio Space Grant Consortium, 2017–2018
$3,500 award for "Modeling and Simulation of an Electrorheological Fluid-based Haptic Device"

Undergraduate Research Award, Miami University, Spring 2017
$720 grant for "Design & Performance Evaluation of a Miniature Haptic Actuator based on Electrorheological Fluids"

NASA/OSGC Undergraduate STEM Scholarship, Ohio Space Grant Consortium, 2016–2017
$3,500 award for "Application of Electrorheological Fluids for Haptic Feedback"

Redhawk Excellence Scholarship, Miami University, 2014–2018
Scholarship award based on academic achievement and rigor

President's List, MU College of Engineering and Computing, Spring 2016, 2017, 2018
Semester GPA $=$ 4.00/4.00

Dean's List, MU College of Engineering and Computing, Fall 2014, 2015, 2016, 2017, Spring 2015
Semester GPA $\geq$ 3.70/4.00

Start the Trend Challenge: First Place, MU College of Engineering and Computing, 2015
Innovation hackathon during Engineers Week with focus on contemporary issues in STEM education

TEACHING, MENTORING, & OUTREACH

Teaching Assistant
Inventing, Engineering and Understanding Interactive Devices (CMSC 23220), University of Chicago Winter 2024
Introduction to Human Computer Interaction (CMSC 20300), University of Chicago Fall 2019, 2021
Dynamic Modeling of Mechanical Systems (MME 311), Miami University Fall 2016, Spring 2017

Mentoring During Ph.D. at UChicago
Andre de la Cruz, Undergraduate, *in review*
Jacob Serfaty, Undergraduate, *Stick&Slip, CHI'24*
Borui Li, Undergraduate, *ThermalRouter, UIST'23*
Daria Shifrina, Undergraduate, *ThermalRouter, UIST'23*
Aryan Gupta, High School, *in review*
Beza Desta, Undergraduate, *ThermalGrasp, VR'24*
Joyce Passananti, Undergraduate, *ThermalRouter, UIST'23*
Maddie DeVoe, Undergraduate, *HRI Touch, RO-MAN'22*

Mentoring During M.S. at Miami University
Jake Zafar, Undergraduate, *Haptics and Flexible Sensors*
Adam Coon, Undergraduate, *Magnetorheological Fluid-based Actuators*
Sae-Hyun Sone, Undergraduate, *Induction Heating Modeling*

Modern Materials Technology 2019 – 2020
- ▷ Volunteered during the school year to co-teach a materials science course at Lindblom Math and Science Academy
- ▷ Developed lecture slides, handouts, and hands-on labs and demos covering material science fundamentals

SERVICE & MEMBERSHIPS

Program Committee
ACM Creativity & Cognition (C&C) Associate Chair 2025
ACM CHI Late-Breaking Work Associate Chair 2022 – 2024

Reviewing
I regularly review for conferences and journals (**over 100 reviews since 2018**). I received **10 special recognitions** for outstanding reviews (formal distinction) from venues like ACM CHI, ACM UIST, IEEE WHC, and Smart Materials & Structures. I have reviewed for ACM CHI, ACM UIST, IEEE Transactions on Haptics, Smart Materials and Structures, IEEE WHC, ACM SIGGRAPH Asia, IEEE TVCG, IEEE VR, Sensors and Actuators: A. Physical, ACM/IEEE HRI, IEEE ISMAR, ACM TEI, ACM DIS, ACM C&C, IEEE RO-MAN, Eurohaptics, ISWC, ACM Augmented Humans, & ACM MUM.

Session Chair
"Haptics and Embodied Interaction B" session at ACM CHI 2024

Student Volunteer
IEEE Haptics Symposium 2024
IEEE VR 2024
ACM/IEEE HRI 2022
Augmented Humans 2021
ACM CHI (canceled due to COVID-19) 2020
ACM UIST 2019

Professional Memberships
ACM SIGCHI, American Society of Mechanical Engineers (ASME), Tau Beta Pi

PROFESSIONAL DEVELOPMENT

Entrepreneurship for Science and Medicine, University of Chicago (Booth), 2024
Quarter-long course within the Chicago Booth School for Business/Polsky Center

Biochips Summer School, University of Colorado Boulder, 2019
Five-day course on digital microfluidics research led by Prof. Mirela Alistar at the ATLAS Institute

Leadership in the Real World, Miami University, 2015
Semester-long course on leadership hosted by the Lockheed Martin Leadership Institute

ADDITIONAL WORK EXPERIENCE

Bruner Corporation May 2016 – Aug 2016
Energy Engineering Intern *Columbus, OH*
- ▷ Implemented energy savings solutions and improved company workflows through scripting and automation

Miami University, Institute for the Environment and Sustainability Jan 2016 – May 2016
Undergraduate Research Assistant *Oxford, OH*
- ▷ Conducted policy and engineering research with focus on university efforts toward energy efficiency

HBK Engineering May 2015 – Aug 2015
Engineering Intern *Chicago, IL*

- ▷ Performed topographic land survey, settlement monitoring and construction layout for utilities industry

GRADUATE COURSEWORK

HCI/Computer Science: Emergent Interface Technologies, Human-Robot Interaction, Printed Circuit Board Engineering, Human Computer Interaction meets Neuroscience, Machine Learning, Deep Learning for 3D Geometry, Algorithms, Discrete Math, Computer Networking

Mechanical Engineering: Adv. Mechanics of Materials, Engineering Analysis/Numerical Methods, Adv. Vibration, Mechanical Behavior of Materials, Biomaterials, Scientific Programming, Applied Nonlinear Dynamics

SELECTED PRESS

Stick&Slip (CHI 2024)
"University of Chicago Computer Science Researchers To Present Ten Papers at CHI 2024," UChicago CS 2024

ThermalRouter (UIST 2023)
"Can you take the heat?," Hackster.io 2023

MagnetIO (CHI 2021)
"This could get sticky," Hackster.io 2021
"Magnet IO: New tactile actuator with voice coil," Auror Design 2021
"Ten Papers at CHI 2021 Flourish Frontiers of HCI Research at UChicago CS," UChicago CS 2021

Strain-Invariant Pressure Sensor (Science Advances 2021)
"Stretchable pressure sensor could lead to better robotics, prosthetics," EurekAlert 2021
"Stretchable sensors could improve prosthetics and robotics," labroots 2021

About Alex
"Alex Mazursky researches fluid to help people "feel" the digital world," Miami University CEC 2018
"Two CEC students receive Provost's Student Academic Achievement Award," Miami University CEC 2017