

# Alex Mazursky (he/him)

PhD Student at the University of Chicago  
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## ABOUT ME

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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, material science, 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

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### 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

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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 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

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- [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.*

### SHORT PUBLICATIONS, WORKSHOP PAPERS & ABSTRACTS

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- [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

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- [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

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

## RESEARCH EXPERIENCE

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### **Meta, Reality Labs Research**

*Haptics Research Scientist Intern*

June 2023 – Oct 2023

Redmond, WA

- ▷ Developed a new haptic device for pressure sensations (paper in progress), supervised by Priyanshu Agarwal
- ▷ Designed, prototyped and manufactured a bistable electromagnetic actuator with greater force, greater displacement, and faster response time than the state-of-the-art
- ▷ Characterized electromechanical performance of the actuator with custom jigs and DAQ programming

### **University of Chicago, Department of Computer Science**

*Graduate Research Assistant*

Aug 2019 – Present

Chicago, IL

- ▷ Investigating unconventional approaches to engineering haptic actuators from the ground up

### **Miami University, Department of Mechanical Engineering**

*Under/Graduate Research Assistant*

Feb 2016 – May 2019

Oxford, OH

- ▷ Designed, fabricated and tested a combined kinesthetic-tactile actuator based on electrorheological fluids

### **Korea Advanced Institute of Science and Technology (KAIST)**

*Visiting Student Researcher*

May 2018 – Aug 2018

Daejeon, South Korea

- ▷ Prototyped a “multicopter-to-mothership” drone docking mechanism, supervised by Prof. Jae-Hung Han in the Smart Systems and Structures Lab: Design and Control

### **Miami University, Department of Mechanical Engineering**

*Undergraduate Research Assistant*

Aug 2017 – Dec 2017

Oxford, OH

- ▷ 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)**

*Senior Capstone Research*

Jun 2017 – Jul 2017

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)

## HONORS & AWARDS

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**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 “Design of a miniature actuator based on electrorheological fluid for conveying realistic haptic feedback”

**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

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### 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, <i>in review</i>	Aryan Gupta, High School, <i>in review</i>
Jacob Serfaty, Undergraduate, <i>Stick&amp;Slip</i> , CHI’24	Beza Desta, Undergraduate, <i>ThermalGrasp</i> , VR’24
Borui Li, Undergraduate, <i>ThermalRouter</i> , UIST’23	Joyce Passananti, Undergraduate, <i>ThermalRouter</i> , UIST’23
Daria Shifrina, Undergraduate, <i>ThermalRouter</i> , UIST’23	Maddie DeVoe, Undergraduate, <i>HRI Touch</i> , 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

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### Program Committee

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

### 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

### SKILLS

**Engineering:** Design, Rapid Prototyping, Mechanical Testing, CAD (Solidworks, Inventor, etc.), Printed Circuit Boards (KiCAD), Modeling and Simulation (Comsol), Soft/Smart Materials, Electromagnetics, Wireless Power, Thermal

**HCI:** Haptics, AR/VR, Design of Perceptual Experiments, Digital Fabrication

**Programming:** Microcontrollers, DAQs, Python, C/C++, Matlab, Unity, Applied Machine Learning

### 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