

# Alex Mazursky (he/him)

PhD Student at the University of Chicago  
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## RESEARCH INTERESTS

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I create new haptic devices enabled by responsive materials. My multidisciplinary background in mechanical engineering, material science, and computer science helps me to design and implement interactive devices from the fundamental mechanics to the end application.

## EDUCATION

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<b>University of Chicago</b> PhD (& MS) in Computer Science Advisor: Prof. Pedro Lopes, Human Computer Integration Lab	<b>2019 – Present</b>
<b>Miami University</b> MS in Mechanical Engineering Advisor: Prof. Jeong-Hoi Koo, Smart Materials Lab Thesis: Application of Electrorheological Fluid for Conveying Realistic Haptic Feedback in Touch Interfaces <i>Supported by a Graduate Fellowship from NASA and the Ohio Space Grant Consortium</i>	<b>2019</b>
<b>Miami University</b> BS in Mechanical Engineering, Energy Co-Major <i>Summa Cum Laude, Departmental and University Honors</i>	<b>2018</b> GPA: 3.92/4.00

## 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.

## REFEREED CONFERENCE PROCEEDINGS

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- [C.2] **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*.  
Acceptance Rate: 26.3%
- [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.

## SHORT PUBLICATIONS, WORKSHOP PAPERS & ABSTRACTS

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- [W.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.*
- [W.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.*
- [W.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 for Human-Machine Interfaces.*
- [W.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.*
- [W.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.*
- [W.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.2] MagnetIO, ACM SIGGRAPH 2021
- [D.1] MagnetIO, ACM CHI 2021

## HONORS AND 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 issued per year across all undergraduates.
- 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 and 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

## RESEARCH EXPERIENCE

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

- ▷ Creating new haptic devices enabled by responsive materials

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

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

**Korea Advanced Institute of Science and Technology (KAIST)** May 2018 – Aug 2018  
*Visiting Student Researcher* 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** Aug 2017 – Dec 2017  
*Undergraduate Research Assistant* 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)** Jun 2017 – Jul 2017  
*Senior Capstone Research* Daejeon, South Korea

- ▷ Designed applications for a multimodal (combined visual, audio and haptic feedback) tablet, in collaboration with the Korea Research Institute of Standards and Science (KRISS)

**Miami University, Institute for the Environment and Sustainability** Jan 2016 – May 2016  
*Undergraduate Research Assistant* Oxford, OH

- ▷ Performed energy policy and engineering research with a focus on university's efforts toward efficiency in buildings under the supervision of Dr. Sarah Dumyahn

## TEACHING, MENTORING, AND OUTREACH

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### Teaching Assistant

CMSC 20300: Introduction to Human Computer Interaction, University of Chicago  
MME 311: Dynamic Modeling of Mechanical Systems, Miami University

Fall 2019, 2021  
Fall 2016, Spring 2017

### Mentoring During Ph.D. at UChicago

Maddie DeVoe, Undergraduate, *Human-Robot Touch*  
Arjun Voruganti, Undergraduate, *3D Editor for Magnetic Mechanisms*  
Antony Awad, Undergraduate, *3D Editor for Magnetic Mechanisms*  
Elizabeth Ashby deButts, Undergraduate, *Soft Magnet Fabrication*

**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, *Modeling of Induction Heating*

**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 AND MEMBERSHIPS**

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**Program Committee**

ACM CHI Late-Breaking Work Associate Chair

2022

**Reviewing**

I have reviewed 50+ works across the venues below and have received 4 special recognitions for outstanding reviews.

ACM CHI	2020 – 2022
ACM UIST	2020 – 2022
IEEE World Haptics	2019
ACM/IEEE HRI	2021, 2022
IEEE VR	2022
ACM TEI	2022
ACM DIS	2020
IEEE ROMAN	2022
ACM Augmented Human	2020, 2022

**Student Volunteer**

ACM/IEEE HRI	2022
Augmented Humans	2021
ACM CHI (canceled due to COVID-19)	2020
ACM UIST	2019
UChicago AdaWeek	2020
Smell, Taste, & Temperature Symposium	2020

**Miami University**

Undergraduate Research Forum Session Moderator	2019
Dept. of MechE Faculty Search Committee (Student Member)	2018 – 2019
Discover the Sciences Presenter	2017, 2018

**Professional Memberships**

ACM SIGCHI  
 American Society of Mechanical Engineers (ASME)  
 Tau Beta Pi: The Engineering Honor Society  
 The Processing Foundation (Student Member)

**SELECTED PRESS**

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**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," UChicago PME	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

## PROFESSIONAL DEVELOPMENT ACTIVITIES

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**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

## EXTRACURRICULARS

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UChicago HCI Club	2020 – Present
UChicago CS Design Reading Group	2020
Alpha Epsilon Pi, <i>New Member Educator, Secretary, Community Advancement Chair</i>	2015 – 2018
Miami University Eco Representatives	2015 – 2016

## WORK EXPERIENCE

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### **Bruner Corporation**

*Energy Engineering Intern*

May 2016 – Aug 2016

*Columbus, OH*

- ▷ Implemented energy savings solutions and improved company workflows through scripting and automation

### **HBK Engineering**

*Engineering Intern*

May 2015 – Aug 2015

*Chicago, IL*

- ▷ Performed topographic land survey, settlement monitoring and construction layout using robotic total stations and GPS for utilities industry in the Chicago Metropolitan Area

## GRADUATE LEVEL COURSEWORK

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**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

## REFERENCES

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|-------------------------|--|
| 1. <b>Pedro Lopes</b>   | Asst. Professor, University of Chicago |
| 2. <b>Jeong-Hoi Koo</b> | Professor, Miami University            |
| 3. <b>Sarah Sebo</b>    | Asst. Professor, University of Chicago |