Alex J. Mazursky

Ph.D. Student at the University of Chicago
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RESEARCH INTERESTS

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

EDUCATION

University of Chicago **2019 – Present**
Ph.D. in Computer Science
Advisor: Prof. Pedro Lopes, Human Computer Integration Lab

Miami University **2019**
M.S. in Mechanical Engineering
Advisor: Prof. Jeong-Hoi Koo, Smart Materials Lab
Thesis: Application of Electrorheological Fluid for Conveying Realistic Haptic Feedback in Touch Interfaces
Supported by a Graduate Fellowship from NASA and the Ohio Space Grant Consortium

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

RESEARCH EXPERIENCE

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

JOURNAL PUBLICATIONS

[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, SI: Selected papers from ICAST 2018 (2019).

REFEREED CONFERENCE PROCEEDINGS

[C.2] MagnetIO: Passive yet Interactive Soft Haptic Patches Anywhere
Alex Mazursky, Shan-Yuan Teng, Romain Nith, Pedro Lopes
In Proc. ACM CHI 2021. To Appear.
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.

LIGHTLY-REVIEWED SHORT PUBLICATIONS & ABSTRACTS

[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 for Human-Machine Interfaces.

[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.

HONORS AND AWARDS

Center for Data and Computing (CDAC) Doctoral Fellowship, University of Chicago, 2019-2020
$2,500 travel grant for "Health Monitoring Based on Wearable Sweat Sensors," a joint project 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 competition during Engineers Week with focus on contemporary issues in STEM education

TEACHING AND MENTORING

Teaching Assistant
CMSC 20300: Introduction to Human Computer Interaction, University of Chicago Fall 2019
MME 311: Dynamic Modeling of Mechanical Systems, Miami University Aug 2016 – May 2017

Modern Materials Technology, University of Chicago 2019 – Present
Volunteer throughout the school year to co-teach a materials science course at Lindblom Math and Science Academy
Develop lecture slides, handouts and hands-on labs and demos covering matsci fundamentals

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

SERVICE AND MEMBERSHIPS

Reviewing
I have received 3 special recognitions for outstanding reviews.

ACM CHI	2020, 2021
ACM UIST	2020
IEEE World Haptics	2019
ACM/IEEE HRI	2021
ACM DIS	2020
ACM Augmented Human	2020

Student Volunteer

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

PROFESSIONAL DEVELOPMENT ACTIVITIES

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

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

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

HBK Engineering May 2015 – Aug 2015
Engineering Intern *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

Emergent Interface Technologies, Human-Robot Interaction, Adv. Mechanics of Materials, Machine Learning, Engineering Analysis, Adv. Vibration, Mechanical Behavior of Materials, Biomaterials, Scientific Programming, Applied Nonlinear Dynamics, Discrete Math, Computer Networking

REFERENCES

1. **Pedro Lopes** Asst. Professor, University of Chicago
2. **Jeong-Hoi Koo** Professor, Miami University
3. **Tae-Heon Yang** Professor, Korea National University of Transportation
4. **Timothy Cameron** Professor, Miami University
5. **Amit Shukla** Professor, Miami University