

# Alexandra Ion | **Curriculum Vitae**

Research interests: **Interactive design tools to enable digital fabrication of complex shapes and structures**

I propose unifying material and device and develop interactive devices that are as passive as possible. My lab's research focuses on embedding functionality within physical objects' generated microstructure such that they can react to simple input with complex behavior. Such structures enable materials that can, e.g., embed robotic movement, perform computations, or communicate with users. My research and expertise lie at the intersection of human-computer interaction, digital fabrication, computer graphics, and mechanical engineering. My work has been published in and awarded by premier venues, including ACM UIST and CHI.

## **Academic Employment**

- Jan 2021 – present     Sara Kiesler Assistant Professor  
Human-Computer Interaction Institute & Robotics Institute (courtesy)  
Carnegie Mellon University
- Mar 2019 – Nov 2020     Postdoctoral researcher at ETH Zürich  
Advisor: Prof. Olga Sorkine-Hornung, Interactive Geometry Lab

## **Educational Background**

- Sep 2018 – Jan 2019     Research stay at ETH Zürich  
Advisor: Prof. Olga Sorkine-Hornung, Interactive Geometry Lab
- Jul 2013 – Apr 2019     PhD student at Hasso Plattner Institute, University of Potsdam  
*Dr. rer. nat.*     Advisor: Prof. Patrick Baudisch, Human-Computer Interaction  
Thesis: Metamaterial Devices  
Committee: Prof. Scott Hudson, Prof. Sriram Subramanian, Prof. Marc Alexa
- Oct 2010 - Nov 2012     University of Applied Sciences Upper Austria, Hagenberg  
*MSc*     Thesis advisor: Prof. Michael Haller  
Thesis: Uncovering moving off-view objects on large interactive displays.
- May 2012 - Oct 2012     Research stay at University of Waterloo, ON, Canada.  
Advisors: Prof. Mark Hancock, Prof. Stacey Scott
- Oct 2006 - Jul 2009     University of Applied Sciences Upper Austria, Hagenberg  
*BSc*

## Publications

### PEER-REVIEWED PAPERS

*ACM CHI and UIST are premiere venues for HCI, 20-26% acceptance rate.*

- [20] ConeAct: A Multistable Actuator for Dynamic Materials  
Yuyu Lin, Jesse T. Gonzalez, Zhitong Cui, Yash Rajeev Banka, **Alexandra Ion**.  
Accepted to ACM CHI'24. Acceptance rate: 26%
- [19] Robotic Metamaterials: A Modular System for Hands-On Configuration of Ad-Hoc Dynamic Applications  
Zhitong Cui, Shuhong Wang, Violet Yinuo Han, Tucker Rae-Grant, Willa Yunqi Yang, Alan Zhu, Scott E. Hudson, **Alexandra Ion**.  
Accepted to ACM CHI'24. Acceptance rate: 26%
- [18] BlendMR: A Computational Method to Create Ambient Mixed Reality Interfaces  
Violet Yinuo Han, Hyunsung Cho, Kiyosu Maeda, **Alexandra Ion**, David Lindlbauer  
In *Proceedings of ACM PACM (ISS'23)*.  
**BEST PAPER AWARD.**
- [17] Reprogrammable Digital Metamaterials for Interactive Devices.  
Yu Jiang, Shobhit Aggarwal, Zhipeng Li, Yuanchun Shi, **Alexandra Ion**.  
In *Proceedings of ACM UIST'23*. San Francisco, CA. Oct 29 – Nov 1, 2023. Acceptance rate: 25%
- [16] Parametric Haptics: Versatile Geometry-based Tactile Feedback Devices.  
Violet Yinuo Han, Abena Boadi-Agyemang, Yuyu Lin, David Lindlbauer, **Alexandra Ion**.  
In *Proceedings of ACM UIST'23*. San Francisco, CA. Oct 29 – Nov 1, 2023. Acceptance rate: 25%
- [15] Constraint-Driven Robotic Surfaces, at Human-Scale.  
Jesse T Gonzalez, Juhi Kedia, Sapna Tayal, Sonia Prashant, **Alexandra Ion**, Scott E Hudson.  
In *Proceedings of ACM UIST'23*. San Francisco, CA. Oct 29 – Nov 1, 2023. Acceptance rate: 25%  
**Best demo award.**
- [14] MiuraKit: A Modular Hands-On Construction Kit For Pneumatic Shape-Changing And Robotic Interfaces.  
Zhitong Cui, Shuhong Wang, Junxian Li, Shijian Luo, **Alexandra Ion**.  
In *Proceedings of ACM DIS'23*. Pittsburgh, PA. July 10 – 14, 2023. Acceptance: 24%
- [13] Reconfigurable Elastic Metamaterials.  
Willa Yunqi Yang, Yumeng Zhuang, Luke Darcy, Grace Liu, **Alexandra Ion**.  
In *Proceedings of ACM UIST '22*. Bend, Oregon. Oct 29 – Nov 2, 2022
- [12] Developable Metamaterials: Mass-fabricable Metamaterials by Laser-Cutting Elastic Structures.  
Madlaina Signer, **Alexandra Ion**, and Olga Sorkine-Hornung.  
In *Proceedings of ACM CHI '21*. Virtual Conference (originally Yokohama, Japan), May 8 – 13, 2021.
- [11] Shape Approximation by Developable Wrapping.  
**Alexandra Ion**, Michael Rabinovich, Philipp Herholz, and Olga Sorkine-Hornung.  
*ACM Transactions on Graphics* 39, 6. 2020. (Proceedings of SIGGRAPH ASIA)

- [10] Understanding Metamaterial Mechanisms.  
**Alexandra Ion**, David Lindlbauer, Philipp Herholz, Marc Alexa, and Patrick Baudisch.  
In *Proceedings of ACM CHI '19. Glasgow, UK, May 4 – 9, 2019.*
- [9] TrussFormer: 3D Printing Large Kinetic Structures.  
Robert Kovacs, **Alexandra Ion**, Pedro Lopes, Tim Oesterreich, Johannes Filter, Philipp Otto, Tobias Arndt, Nico Ring, Melvin Witte, Anton Synytsia, and Patrick Baudisch.  
In *Proceedings of ACM UIST'18. Berlin, Germany, October 14 – 17, 2018.*  
ACM CHI'19 Video Showcase **Best Visual Communication Award.**
- [8] Metamaterial Textures.  
**Alexandra Ion**, Robert Kovacs, Oliver Schneider, Pedro Lopes and Patrick Baudisch.  
In *Proceedings of ACM CHI '18. Montreal, Canada, April 21 – 26, 2018.*
- [7] Adding Force Feedback to Mixed Reality Experiences and Games using Electrical Muscle Stimulation.  
Pedro Lopes, Sijing You, **Alexandra Ion**, and Patrick Baudisch.  
In *Proceedings of ACM CHI '18. Montreal, Canada, April 21 – 26, 2018.*
- [6] Digital Mechanical Metamaterials.  
**Alexandra Ion**, Ludwig Wall, Robert Kovacs, and Patrick Baudisch.  
In *Proceedings of ACM CHI '17. Denver, CO, May 6 – 11, 2017.*
- [5] Metamaterial Mechanisms.  
**Alexandra Ion**, Johannes Frohnhofen, Ludwig Wall, Robert Kovacs, Mirela Alistar, Jack Lindsay, Pedro Lopes, Hsiang-Ting Chen, and Patrick Baudisch.  
In *Proceedings of ACM UIST'16. Tokyo, Japan, October 16 – 19, 2016. pp. 529-539.*  
**BEST PAPER HONORABLE MENTION** (top 2% of submissions).
- [4] Skin drag displays: dragging a physical tactor across the user's skin produces a stronger tactile stimulus than vibrotactile.  
**Alexandra Ion**, Edward Wang, and Patrick Baudisch.  
In *Proceedings of ACM CHI'15. Seoul, Korea, April 18 – 23, 2015.* Short paper.
- [3] Proprioceptive Interaction.  
Pedro Lopes, **Alexandra Ion**, Willi Mueller, Daniel Hoffmann, Patrik Jonell, Patrick Baudisch.  
In *Proceedings of ACM CHI'15. Seoul, Korea, April 18 – 23, 2015.*
- [2] Impacto: Simulating Physical Impact by Combining Tactile Stimulation with Electrical Muscle Stimulation.  
Pedro Lopes, **Alexandra Ion**, Patrick Baudisch.  
In *Proceedings of ACM UIST'15. Charlotte, NC, November 8 – 11, 2015.*
- [1] Canyon: Providing location awareness of multiple moving objects in a detail view on large displays.  
**Alexandra Ion**, Yu-Ling Chang, Michael Haller, Mark Hancock, Stacey Scott.  
In *Proceedings of ACM CHI'13. Paris, France, April 27 – May 2, 2013. 3149-3158.*  
**BEST PAPER HONORABLE MENTION** (top 5% of submissions).

## NON-PEER-REVIEWED PUBLICATIONS

- [5] Interactive Metamaterials.  
**Alexandra Ion** and Patrick Baudisch.  
Magazine article. ACM interactions, January/February 2020.
- [4] Metamaterial Devices.  
**Alexandra Ion** and Patrick Baudisch.  
In ACM SIGGRAPH 2018 Studio.
- [3] Using Your Own Muscles: Realistic physical experiences in VR.  
Pedro Lopes, **Alexandra Ion**, Robert Kovacs.  
Magazine article, ACM XRDS, Fall 2015, Vol. 22.
- [2] Understanding mid-air hand gestures: A study of human preferences in usage of gesture types for HCI.  
Roland Aigner, Daniel Wigdor, Hrvoje Benko, Michael Haller, David Lindlbauer, **Alexandra Ion**, Shengdong Zhao, and Jeffrey Tzu Kwan Valino Koh.  
*Technical Report MSR-TR-2012-111*. 2012.
- [1] Hot Topics in Personal Fabrication Research. Tutorial.  
Stefanie Mueller, **Alexandra Ion**, and Patrick Baudisch.  
In *Proceedings of ACM ITS 2014*, 499-502.

## DEMONSTRATIONS

*...of physical prototypes and software during hands-on sessions*

- [8] Constraint-Driven Robotic Surfaces. *ACM UIST 2023 Demonstration*.
- [7] Parametric Haptics. *ACM UIST 2023 Demonstration*.
- [6] Reprogrammable Digital Metamaterials for Interactive Devices. *ACM UIST 2023 Demonstration*.
- [5] Metamaterial Devices. *ACM SIGGRAPH 2018 Studio Installation*. August 2018.
- [4] Metamaterial Devices. *ACM CHI 2018 Interactivity*. May 2018.
- [3] Metamaterial Mechanisms & Digital Mechanical Metamaterials. *ACM CHI 2017 Interactivity*. May 2017.
- [2] Metamaterial Mechanisms. *ACM UIST 2016 Demonstration*. October 2016.
- [1] Impacto: Simulating Physical Impact by Combining Tactile Stimulation with EMS. *ACM UIST 2015 Demonstration*. November 2015.

## Awards & Honors

### ACADEMIC

- [10] **Best paper** award. ACM PACM (ISS'23).
- [9] Best demo award. ACM UIST 2023.
- [8] Received the **Sara Kiesler Junior Development Chair** at CMU HCII for 2023-2024.
- [7] Selected for **Rising Stars in EECS 2019**.
- [6] Best visual communication award for TrussFormer. ACM CHI 2019 Video Showcase.

- [5] Scholarship for academic exchange (2018 DAAD FIT program, ~9 000 EUR)
- [4] My CHI 2015 talk is the example for a good presentation on the CHI conference website, 2016 – present
- [3] **Best paper honorable mention** award. ACM UIST 2016.
- [2] **Best paper honorable mention** award. ACM CHI 2013.
- [1] Nominated for national best master's thesis award. 2012.

## INDUSTRY/ART/DESIGN

- [5] Fast Company's Innovation by Design Award (Honorable Mention) 2018, for Adding Force Feedback to MR.
- [4] VIDA. Incentive Award 2016, for Ad Infinitum.
- [3] Bronze Cyber Lion, Cannes Lions 2010, for "Last call" (interactive movie)
- [2] Bronze Media Lion, Cannes Lions 2010, for "Last call" (interactive movie)
- [1] Bronze "Digital Media Craft", ADC Germany 2010, Art directors club, for "Last call" (interactive movie)

## Invited Talks

- [44] University of Konstanz, hosted by Tiare Feuchtner & Harald Reiterer. July 6, 2023.
- [43] Austrian CS Day, hosted by IST Austria. June 21, 2022.
- [42] University of Washington, Computational Fabrication, hosted by Adriana Schulz, Jeff Lipton. April 13, 2022.
- [41] Stony Brook University, Civil Engineering Seminar, hosted by Paolo Celli. November 15, 2021.
- [40] Tsinghua University, Access Computing Summer Program, hosted by Yukang Yan. August 10, 2021.
- [39] MIT Summer Geometry Institute, hosted by Justin Solomon. August 3, 2021.
- [38] Stanford HCI Seminar, hosted by Michael Bernstein. May 28, 2021.
- [37] Toronto Geometry Colloquium, hosted by Alec Jacobson, Silvia Sellan. March 31, 2021.
- [36] CMU Mechanics Seminar, hosted by Kaushik Dayal. October 2, 2020.
- [35] University of Toronto, hosted by Tovi Grossman. March 26, 2020.
- [34] Carnegie Mellon University, hosted by Scott Hudson. March 23, 2020.
- [33] Boston University MechE, hosted by Alice White. March 17, 2020.
- [32] Boston University CS, hosted by Emily Whiting. March 16, 2020.
- [31] University of Chicago, hosted by Blase Ur. March 12, 2020.
- [30] Aalto University, hosted by Elisa Mekler, Antti Oulasvirta. March 5, 2020.
- [29] IST Austria, hosted by Bernd Bickel. March 2, 2020.
- [28] Cornell University, hosted by Cheng Zhang, François Guimbretière. February 26, 2020.
- [27] TU Delft CS, hosted by Elmar Eisemann. February 7, 2020.
- [26] TU Delft PME, hosted by Just Herder. February 4, 2020.
- [25] Aalto University, hosted by Antti Oulasvirta. December 17, 2019.
- [24] University of Copenhagen. December 16, 2019
- [23] TU Delft, hosted by Just Herder. November 14, 2019.
- [22] University of Chicago, hosted by Pedro Lopes. October 29, 2019.
- [21] University of Stuttgart, hosted by Achim Menges. September 16, 2019.
- [20] Google (Mountain View), hosted by Alex Olwal. August 9, 2019.
- [19] UC Berkeley, hosted by Björn Hartmann. August 8, 2019.

- [18] Stanford, hosted by Sean Follmer. August 7, 2019.
- [17] UCLA, hosted by Ankur Mehta. August 2, 2019.
- [16] MIT Media Lab, hosted by Hiroshi Ishii. June 19, 2019.
- [15] MIT CSAIL, hosted by Stefanie Mueller. June 19, 2019.
- [14] ETH Zurich, PhD Seminar. October 26, 2018.
- [13] University of Sussex, hosted by Diego Martínez & Sriram Subramanian. May 21, 2018.
- [12] Université de Montréal, hosted by Bernhard Thomaszewski. April 27, 2018.
- [11] IST Austria, hosted by Bernd Bickel. March 2, 2018.
- [10] ETH Zürich, hosted by Olga Sorkine-Hornung. December 14, 2017.
- [9] SAP Walldorf, hosted by Andreas Polze & Bernd Welz. December 11, 2017.
- [8] TU Delft, hosted by Jouke Verlinden. December 4, 2017.
- [7] Aarhus University, hosted by Roman Rädle. October 5, 2017.
- [6] Technomania, hosted by The Danish Society of Engineers IDA. October 4, 2017
- [5] Driving 3D, hosted by The Danish Society of Engineers, IDA. September 29, 2017.
- [4] TEDx Poznan, Poland. April 8, 2017.
- [3] Singularity University Copenhagen, hosted by Märtha Rehnberg. December 14, 2016.
- [2] TU Berlin, hosted by Marc Alexa. 2016.
- [1] TU Berlin, hosted by Marc Alexa. 2015.

## Professional Service

### PROGRAM COMMITTEE

Program committee chairing: ACM **UIST 2024** program co-chair  
ACM **CHI 2024** subcommittee co-chair “Building Devices”  
ACM SIGGRAPH 2024 – Poster chair  
ACM **CHI 2023** subcommittee co-chair “Building Devices”

Program committee member: ACM **CHI** 2022, 2021, 2020, 2019  
ACM **UIST** 2022, 2021, 2020  
ACM CHI 2023, 2022 Best paper committee  
ACM SIGGRAPH 2023, 2022, 2021 – Posters committee  
ACM SIGGRAPH Asia 2019 – Technical briefs and posters  
Graphics Interface 2020

### CONFERENCE ORGANIZING

Organizing committee: ACM SIGGRAPH 2023 – Student Research Competition chair  
ACM UIST 2022, 2023 – Doctoral Symposium co-chair  
ACM UIST 2020, 2021 – Demonstrations co-chair  
ACM UIST 2019 – Sustainability co-chair  
ACM UIST 2018 – Local arrangements co-chair, Accessibility chair

ACM UIST 2017 – Student volunteer co-chair  
ACM UIST 2016 – Documentation chair

Session chair: at ACM CHI 2023, session “Wearables and Materials”  
at ACM CHI 2019, session “Designing with Materials”  
at ACM CHI 2018, session “Craft, Fabrication, Making”  
at ACM CHI 2017, session “Haptics on Skin”

Student volunteer: ACM CHI 2016, ACM UIST 2015, ACM ITS 2014

## REVIEWING

Conferences: ACM CHI 2018 – 2014  
ACM UIST 2023, 2019 – 2016  
ACM SIGGRAPH 2023, 2020  
ACM SIGGRAPH Asia 2018  
ACM TEI 2019, 2017  
ACM DIS 2023, 2017, 2016  
ACM Augmented Human 2016, 2015  
IEEE World Haptics 2015, 2017  
IEEE Haptics Symposium 2018  
ACM ICMI 2017, ACM SUI 2016

Journals: Programmable Materials 2023  
ACM Transactions on Graphics 2022  
ACM IMMUT 2019  
Elsevier Computers & Graphics 2018  
Nature Scientific Reports 2018  
Interacting with Computers 2014

## UNIVERSITY/DEPARTMENT SERVICE

2023 – now HCII Executive committee  
2022/2023 HCII PhD admissions **co-chair**  
2021/2022 HCII PhD admissions committee  
2022 HCII REU admissions committee  
2021 Giving MHCI capstone critique  
2021 BHCI admissions committee  
2021 HCII REU admissions committee

## OUTREACH

2022 – now	Mentor for <u>WiGRAPH</u> (ACM Community for Women in Computer Graphics Research) providing mentorship for early career women in computer graphics & HCI
2022 – 2023	Mentor for junior CMU HCII PhD students leading a mentoring group to support junior PhD students, bi-weekly meetings
2022 – 2023	Lecturer at the Computational Interaction summer schools (Saarbrücken and Ann Arbor). Topic: “Geometric optimization” (3-hour lecture)
2023	Hosting 1 student for their Research Experience for Undergraduates (REU) at HCII, CMU
2022 – 2023	External mentor for Research Experience for Undergraduates (REU) Site at the University of Texas at Arlington, topic: “Hybrid Design and Fabrication”
2021	Guest speaker at MIT Summer Geometry Initiative a research-oriented summer school for international undergraduate students
2021	Guest speaker at Tsinghua Global Innovation Exchange Institute a research-oriented summer school for international undergraduate students
2021	Hosting 2 students for their Research Experience for Undergraduates (REU) at HCII, CMU
2019 – 2020	Co-lead of the Network of Women in Computer Science (GSNOW) at ETH Zurich an organization to mentor women in CS, provide mentoring and networking opportunities.

## Advising & mentoring

### PHD STUDENTS

Sep 2023 – present	Violet Han PhD student at CMU HCII
Sep 2022 – present	Yuyu Lin PhD student at CMU HCII
Sep 2021 – present	Hatice Gökçen Güner PhD student at CMU CEE Co-advised with Kaushik Dayal (CMU CEE)
Sep 2019 – present	Jesse Gonzalez PhD student at CMU HCII Advised by Scott Hudson (CMU HCII), Co-mentored by me



## MASTER'S STUDENTS

2022 – 2023	Violet Han (CMU SoA) Wearable Haptic Metamaterials. (submitted to ACM UIST 2023)
2021 – 2022	Yunqi Willa Yang (CMU SoA) Robotic Metamaterials. (accepted at ACM UIST 2022)
2020	Madlaina Signer (ETH Zurich) Developable Metamaterials: Mass-fabricable Metamaterials by Laser-Cutting Elastic Structures. (accepted at ACM CHI 2021)
2016	Ludwig Wilhelm Wall (Hasso Plattner Institute, Germany) Design and Synthesis of Digital Mechanical Metamaterials. (accepted at ACM CHI 2017)

## RESEARCH PROJECT STUDENTS

*Students participating in ongoing research projects for 1 – 2 semesters, typically.*

### **at CMU (2021 – 2023)**

[1] Eric Grynberg (undergraduate)	[16] Yunqi Willa Yang (masters)
[2] Hugo Oliveira (visiting PhD student, Uni Bozen)	[17] Alan Zhu (undergraduate)
[3] Violet Han (masters)	[18] Joanne Chin (undergraduate)
[4] Zachery Hamilton (undergraduate)	[19] Yumeng Zhuang (masters)
[5] Abena Boadi-Agyemang (PhD, SCS RI)	[20] Yu Jiang (undergraduate)
[6] Shuhong Wang (visiting undergraduate from ZJU)	[21] Yufei Xiao (REU from Minerva Schools at KGI)
[7] Zhitong Cui (visiting PhD student from ZJU)	[22] Xu Claire Xu (undergraduate)
[8] Semina Yi (masters)	[23] Tianyi Chen (undergraduate)
[9] Karen Kang (REU from UMass Amherst)	[24] Sidney Wang (undergraduate)
[10] Victoria Nguyen (undergraduate)	[25] Raaid Tanveer (undergraduate)
[11] Julia Anitescu (undergraduate)	[26] Miguel Brandao (REU from CMU)
[12] Karina Shethia (undergraduate)	[27] Luke Darcy (undergraduate)
[13] Juhi Kedia (undergraduate)	[28] Jerry Cao (REU from University of Washington)
[14] Tracy Meng (masters)	[29] Dunmin Victor Zhu (undergraduate)
[15] Maryam Khodadad (PhD, CIT/CEE)	

### **before CMU (2013 – 2020)**

[30] Nuno Dantas Pereira (undergraduate)	[38] Noel Danz (2x undergraduate)
[31] Michael Janke (masters)	[39] Friedrich Horschig (masters)
[32] Pascal Crenzin (masters)	[40] Sijing You (masters)
[33] Benjamin Feldmann (masters)	[41] Martin Fritzsche (masters)
[34] Martin Schlegel (masters)	[42] Max Schneider (masters)
[35] Johannes Frohnhofen (2x undergrad & masters)	[43] Martin Fischer (undergraduate)
[36] Johannes Filter (masters)	[44] Julian Risch (undergraduate)
[37] John Geiger (undergraduate)	[45] Florian Meinel (undergraduate)

## THESIS COMMITTEES

Jianzhe Gu. Carnegie Mellon University.

PhD Thesis Proposal “Computational Design of Morphing Looped Graph Structures”

Velko Vechev. ETH Zurich. February 5, 2024.

PhD Thesis “Computational design and fabrication of wearable haptics”

Semyon Efremov. Université de Lorraine. May 3, 2021.

PhD Thesis “Parametrized growth and procedural noise for mechanical metamaterial design”

## Teaching

### FULL COURSES

Fall 2023. Instructor for 05-430/630 “Programming Usable Interfaces”. CMU. ~87 students.

Spring 2023. Instructor for 05-435/835 “Applied Fabrication for HCI”. CMU. ~33 students.

Fall 2022. Instructor for 05-430/830 “Programming Usable Interfaces”. CMU. ~92 students.

Spring 2022. Instructor for 05-435/835 “Applied Fabrication for HCI”. CMU. ~22 students.

Fall 2021. Instructor for 05-430/830 “Programming Usable Interfaces”. CMU. ~102 students.

### GUEST LECTURES

Spring 2021, 2022, 2024 05-120 Introduction to Human-Computer Interaction (CMU HCII)

Fall 2023 05-499 Interactive Extended Reality,  
2 lectures on “Geometric Optimization” (CMU HCII)

Spring 2021 05-300 HCI Undergraduate Pro Seminar (CMU HCII)

## Research Grants & Gifts

2023 – 2024 **Low-cost trial prosthetic feet for at home testing**  
Funding body: Pennsylvania Infrastructure Technology Alliance  
Investigators: PI: Alexandra Ion, Co-PI: Douglas Weber, Industry partner: Humotech  
Amount: \$81,358

2022 – 2023 **Self-reconfigurable haptic actuation for multi-modal metaverse**  
Funding body: Accenture Technology Labs  
Investigators: PIs: Alexandra Ion, David Lindlbauer, Nik Martelaro  
Amount: \$110,000

2021 – 2022      **Custom & Lightweight Prosthetics Using Metamaterials**  
Funding body: CMU CIT IS4 Moonshot  
Investigators: Alexandra Ion, Kaushik Dayal  
Amount: \$85,122

### **FELLOWSHIPS & AWARDS FOR MY ADVISEES**

2023 – 2024      **Machine Learning Driven Metamaterial Design for Customizable Prosthetic Sockets with Real-Time High-Fidelity Sensors**  
CMLH Fellowship in Digital Health Innovation  
for Hatice Gokcen Guner

## **Invited Exhibitions**

### **METAMATERIAL DEVICES**

**Ars Electronica Center**, Linz, Austria. 2019 – 2021.  
BMBF (**German federal ministry for education and research**) InnoTruck (travelling exhibition). 2017 – 2020.  
UNIVERSUM Mexico City, “3D, printing the world”. September 2019 – February 2020.  
Espacio Fundación Telefónica Chile, Santiago, “3D, printing the world”. March 2019 – July 2019.  
Espacio Fundación Telefónica Argentina, Buenos Aires, “3D, printing the world”. July 2018 – October 2018.  
Espacio Fundación Telefónica Peru, Lima, “3D, printing the world”. December 2017 – April 2018.  
Espacio Fundación Telefónica Spain, Madrid, “3D, printing the world”. June – September 2017.  
CeBit 2017. Futurium booth (Berlin-based museum for ideas of the future). March 20 – 24, 2017.

### **AD INFINITUM** (<http://a-parasite.org/>)

Przemiany Festival, Copernicus Science Center Warsaw. September 13-16, 2018.  
World Economic Forum, San Francisco. December 2017 – May 2018.  
**Ars Electronica Festival**, Linz, Austria. 7-11 September 2017.  
Science Gallery Dublin, Ireland, “Humans need not apply”. February – May 2017.  
Natural History Museum Bern, Switzerland. September 9, 2016.

## **Selected Press**

IEEE Spectrum. Mechanical Metamaterials and other 3D Printing Tech from CHI 2017. 2017.  
3ders.org. Researchers use 3D printing to make 'digital mechanical metamaterials' that function like machines. 2017.  
think3D. 'Digital Mechanical Metamaterials' made by the Researchers. 2017.  
digital trends. This 3D printed door latch can be unlocked with a PIN code, yet doesn't require electricity. 2017.  
fast company. These Metamaterials Act Like Machines. 2016.  
gizmodo. This Simple 3D-Printed Door Handle Works Without Any Moving Parts. 2016.

creative applications. Metamaterial Mechanisms – 3D Grids with Mechanical Properties. 2016.  
Make:. “Metamaterials” Allow You to 3D Print Simple Machines. 2016.  
dezeen. Metamaterials Make it Possible to Create Mechanisms from a Single Piece of Plastic. 2016.  
digital trends. 3D-printed Metamaterial ‘Machines’ are Greater than the Sum of their Parts. 2016.