# Nathan DeVrio

*Human-Computer Interaction Ph.D. Student,*
*Carnegie Mellon University*

*407 S Craig St*
*Pittsburgh, PA 15213*
*(571)-499-3442*
*ndevrio@cmu.edu*
*www.nriopelle.me*

## Research Interests

I research the next generation of interactive hardware technologies to address limitations in performance, capability, and usability. New devices should not just fix the shortcomings reported by users of current ones but also enable previously impossible and delightful forms of interaction.

**Technical Areas:** Human-Computer Interaction, Sensors, Activity Recognition, AR/VR, Ubiquitous Computing

## Education

*2020 - Present*
*Pittsburgh, PA*
**Carnegie Mellon University**,
*Human-Computer Interaction Institute*,
Ph.D. in Human-Computer Interaction.

*2016 - 2020*
*Ann Arbor, MI*
**University of Michigan**,
Bachelors of Science in Engineering in Computer Engineering,
GPA: 3.94/4.00.

## Professional Experience

*2020 - Present*
*Pittsburgh, PA*
**Future Interfaces Group**, *Carnegie Mellon University*, Ph.D. Student,
Advisor: Chris Harrison
Creating novel sensing devices for aiding in interaction tasks. The technical areas that I specialize in include sensor hardware design, embedded programming, and machine learning for sensor data.

*2018 - 2020*
*Ann Arbor, MI*
**Interactive Sensing and Computing Lab**, *University of Michigan*, Undergraduate Researcher,
Advisor: Alanson Sample
Designed a wrist-worn device to detect different ways a user interacts with objects or surfaces and determine their activity by measuring properties of the body and the environment.

*Summer 2019*
*Redmond, WA*
**Microsoft Corporation**, *Azure Storage Media and Edge*, SWE Intern,
Mentor: Aniket Malatpure
Developed a root-cause analysis pipeline for Azure Stack. Published a research paper describing the how the dependency graph algorithm I wrote could be applied to any private cloud system.

*Summer 2018*
*Bellevue, WA*
**Microsoft Corporation**, *Azure Storage Media and Edge*, SWE Intern,
Mentors: Aniket Malatpure, Suman Nath
Integrated an instrumentation tool prototyped by Microsoft Research for discovering hard-to-find fault injection and thread-safety bugs earlier in development into product code for Azure Stack.

*2017 - 2018*
*Ann Arbor, MI*
**Robert Dick Group**, *University of Michigan*, Undergraduate Researcher,
Advisor: Robert Dick
Developed an embedded sensing and actuation device for aiding anesthesiologists in improving the accuracy and efficiency of epidural procedures by identifying when the needle is approaching bone.

*Summer 2017*
*Bedford, MA*
**The MITRE Corporation**, *Electronic System Dev*, Embedded Software Intern,
Mentors: Rachel Bainbridge, Chris Niessen
Researched electromagnetic fault injection attacks on cryptographic algorithms implemented on FPGAs. Led a team in an intern embedded security capture the flag competition and placed in the top 5 teams.

*2016 - 2017* **Lab11**, *University of Michigan*, Undergraduate Researcher,
*Ann Arbor, MI* Advisors: Prabal Dutta, Branden Ghena
Resolved errors in the preexisting implementation of a Bluetooth low-energy embedded audio sensor. Redesigned the device after performing power analytics to bring the project to an operational state.

*Summer 2015* **U.S. Naval Research Laboratory**, *Laboratory for Autonomous Systems Research*, Robotics Intern,
*Washington, D.C.* Mentor: Donald Sofge
Used bat-like echolocation delivered via an FPGA sensor platform to identify different terrains an autonomous robot encountered. Published a research paper on my approach and experimental results.

## Publications

### Conference Papers

C.05 **N. DeVrio**, C. Harrison, DiscoBand: Multiview Depth-Sensing Smartwatch Strap for Hand, Body, and Environment Tracking. *In Proceedings of the ACM Symposium on User Interface Software and Technology* (**UIST 2022**).

C.04 K. Ahuja, V. Shen, C. Fang, **N. Riopelle**, A. Kong, C. Harrison, ControllerPose: Inside-Out Body Capture with VR Controller Cameras. *In Proceedings of the International Conference on Human Factors in Computing*, **(CHI 2022)**

C.03 V. Varga, G. Vakulya, B. Buergisser, **N. Riopelle**, F. Zund, R. Sumner, T. Gross, A. Sample, Real-Time Interaction Capture through Physical Contact for Mixed Reality. *In Proceedings of the International Conference on Tangible, Embedded and Embodied Interaction*, **(TEI 2021)**

C.02 **N. Riopelle**, A. Malatpure, S. Ashtekar, V. Raman, Dependency Graph-based Failure Analysis for Private Clouds. *In Proceedings of the International Symposium on Software Reliability Engineering*, **(ISSRE 2019)**

C.01 **N. Riopelle**, P. Caspers, D. Sofge, Terrain Classification for Autonomous Vehicles Using Bat-Inspired Echolocation. *In Proceedings of the International Joint Conference on Neural Networks*, **(IJCCN 2018)**

### Posters

P.01 **N. Riopelle**, A. Sample, ActiMate: A Wrist-Based, Heterogeneous Sensor Platform for Recognizing User Activities and Routines. *University of Michigan Engineering Research Symposium*, Nov 8, 2019

## Awards

2021 **NSF GRFP Honorable Mention**.
2020 **UM EECS Department Outstanding Research Award**.
2019 **UM EECS Department Outstanding Achievement Award**.
2019 **UM EECS Scholar Award**.
2019 **UM Henry Ford II Prize Nominee (from Computer Engineering)**.
2018, 2019 **UM James B. Angell Scholar**.
2017 **UM William J. Branstrom Freshman Prize**.
2016 - 2020 **UM Dean's List**.
2016 - 2020 **UM University Honors**.

## Invited Talks & Panels

2022 **Alumni Panel Member**, *Connect with Michigan ECE*.

## Service

2021, 2022 **Student Volunteer**, *Carnegie Mellon Graduate Application Support Program*.
2022 - Present **Paper Reviewer**, *CHI Conference*.
2022 **Student Volunteer**, *CHI Conference*.

## Teaching Experience & Mentorship

2022 **05-435/865 Applied Fabrication for HCI**, *Teaching Assistant*.

2020 **EECS 598-015 Engineering Interactive Systems**, *Instructional Aide*.

.

2022 **Mentored Vimal Mollyn**, *Master's student*.