NATHANIEL J. HANSON, Ph.D.

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EDUCATION

Northeastern University *August 2020 - December 2023*
Ph.D. Computer Engineering (Robotics)
Research Advisors: Dr. Taşkın Padır; Dr. Kris Dorsey
Research Interests: Multi-sensor fusion, material recognition, active property learning, hyperspectral imaging, unstructured environment perception, robotics.
Dissertation: Material Informed Robotics – Spectral Perception for Object Identification and Parameter Inference

Boston University *June 2019 - August 2020*
M.S. Computer Science
Focus: Big data analysis and machine learning methods for disaster relief and public health.

University of Notre Dame *August 2015 - May 2019*
B.S. Computer Engineering, Minor Theology

Shandong University *May 2017 - August 2017*
Certificate Mandarin Chinese (DoD Project Global Officer)

WORK EXPERIENCE

MIT Lincoln Laboratory June 2019 - Present
Technical Research Staff, Human Resilience Systems

Northeastern University August 2020 - December 2024
Postdoctoral Research Associate (Part-Time) & Graduate Research Assistant

Cubert Hyperspectral GmbH January 2023 - Present
Consulting Software Developer

DeLive Aerial Systems January 2018 - March 2020
Chief Technical Officer & Technical Advisor

Software Engineering and Requirements Center August 2018 - May 2019
Undergraduate Research Assistant

IronNet CyberSecurity June 2018 - May 2019
Cyber Operations Center/Data Science Intern

PUBLICATIONS & PRESENTATIONS

Journal Publications

J1. Laudenslager, Alexis; **Hanson, Nathaniel**, Coad, Margaret. *Limitations of IMU-Based Shape Estimation for Navigating Confined Spaces with Soft Robots.* In preparation, 2025.

J2. McFarland, Ciera; Alvarez Valdivia, Antonio; **Hanson, Nathaniel**; Coad, Margaret. *On Steerability Factors for Growing Vine Robots.* In preparation, 2025.

J3. Alvarez Valdivia, Antonio; Reeve, Robert; McFarland, Ciera; Dhawan, Ankush; Coad, Margaret; **Hanson, Nathaniel**. *An Improved Low Friction Body and Camera Mount for Soft Growing Robots.* In preparation, 2025.

J4. Alvarez, Antonio; McFarland, Ciera; Dhawan, Ankush; Coad, Margaret; **Hanson, Nathaniel**; *A Soft, Open-Source Growing Robot for Urban Search and Rescue.* In preparation, 2025.

J5. **Hanson, Nathaniel**; Stubbins, Aron; Imbiriba, Tales. *Future Directions for Hyperspectral Detection of Micro and Macro Plastics in the Riverine.* In preparation, 2025.

J6. **Hanson, Nathaniel***; Allison, Austin*; DiMarzio, Charles; Padır, Taşkın; Dorsey, Kristen. *Multi-Functional Soft Gripper System for Simultaneous Curvature and Near Infrared Sensing.* Under Review, 2025.

J7. **Hanson, Nathaniel**; Pyatski, Benjamin; Hibbard, Samuel; Lvov, Gary; DiMarzio, Charles; Dorsey, Kristen; Padır, Taşkın. *Field Calibration of Hyperspectral Cameras for Autonomous Terrain Inference.* Under Review, 2025.

J8. **Hanson, Nathaniel***; Mensah, Immanuel Ampomah*; Roberts, Sonia*; Healey, Jessica; Wu, Celina; Dorsey, Kristen. *Controlling the Fold: Proprioceptive Feedback in a Soft Origami Robot.* Frontiers in Robotics and AI. Frontiers Media SA, 2024.

J9. Julien, Scott; **Hanson, Nathaniel**; Lynch, Joseph; Nourian-Avaal, Ahmad; Roberts, Kirstyn; Padır, Taşkın; Özdemir, Ozan; Müftü, Sinan. *In Situ Monitoring of Deposit Shape Buildup during Cold Spraying.* Journal of Thermal Spray Technology. Springer, 2024. *Selected by Editors for inclusion in July/August 2025 edition of International Thermal Spray and Surface Engineering Magazine (iTSSe)*

J10. **Hanson, Nathaniel**; Lvov, Gary; Padır, Taşkın. *Occluded Object Detection and Exposure in Cluttered Environments with Automated Hyperspectral Anomaly Detection.* Frontiers in Robotics and AI. Frontiers Media SA, 2022.

Conference Publications

C1. Wolak, Mateusz; **Hanson, Nathaniel**. *Hype2Go: Ego-Centric Hyperspectral Imaging for Self-Supervised Traversability Estimation.* In preparation, 2025.

C2. Frost, Constantine; Council, Chad; Coad, Margaret; **Hanson, Nathaniel**. *RubbleSim: A Photorealistic Structure Collapse Simulator for Confined Space Mapping.* Under Review, 2025.

C3. Tukpah, James; **Hanson, Nathaniel**; Padır, Taşkın. *Sub-Canopy Fuel Load Mapping Using Multi-modal Ground Vehicles for Wildfire Risk Assessment.* Under Review, 2025.

C4. McFarland, Ciera; Taher, Sarah; **Hanson, Nathaniel**; Coad, Margaret. *Improving Vine Robot Teleoperation via Gravity-Aligned Camera Reorientation.* Under review, 2025.

C5. Leblebicioglu, Damla; Mensah, Immanuel Ampomah; Allen, Joseph; Vadivel, Ahilesh; **Hanson, Nathaniel**; Dorsey, Kristen. *Capacitive Sensor Design for Soft Robots and Smart Garments.*, International Conference on Solid State Sensors and Actuators (TRANSDUCERS). IEEE, 2025.

C6. Suresh, Smruti; Carvajal, Michael; **Hanson, Nathaniel**; Holand, Ethan; Hibbard, Samuel; Padır, Taşkın. *Use-Inspired Mobile Robot to Improve Safety of Building Retrofit Workforce in Constrained Spaces.* IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR). IEEE, 2024.

C7. **Hanson, Nathaniel**; Prajapati, Sarvesh*; Tukpah, James; Mewada, Yash; Padır, Taşkın. *Forest Biomass Mapping with Terrestrial Hyperspectral Imaging for Wildfire Risk Monitoring.* IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR). IEEE, 2024.

C8. McFarland, Ciera; Dhawan, Ankush; Kumari, Riya; Council, Chad; Coad, Margaret*; **Hanson, Nathaniel***. *Opportunities and Challenges for Field Portable Vine Robots in Urban Search and Rescue.* IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR). IEEE, 2024.

C9. **Hanson, Nathaniel**; Manke, Phillip; Berkholz, Simon; Mühlbauer, Maximilian; Heine, Rene; Brandes, Arnd. *Cuvis.Ai: An Open-Source, Intuitive Software Ecosystem for Hyperspectral Image Classification.* 2024 14th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS). IEEE, 2024.

C10. **Hanson, Nathaniel***; **Lvov, Gary***, Rautela, Vedant; Hibbard, Samuel; Holand, Ethan; DiMarzio, Charles; Padır, Taşkın. *PROSPECT: Precision Robot Spectroscopy Exploration and Characterization Tool.* IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). IEEE, 2024.

C11. Allison, Austin*; **Hanson, Nathaniel***; Wicke, Sebastian; Padır, Taşkın. *HASHI: Highly Adaptable Seafood Handling Instrument for Manipulation in Industrial Settings.* IEEE International Conference on Robotics and Automation (ICRA). IEEE, 2024.

C12. Holand, Ethan; Homer, Jarrod; Khandeker, Musheeera Khandeker; Muhlon, Ethan; Patel, Maulik; Storrer, Alex; Vainqueur, Ben-oni; **Hanson, Nathaniel**; Padır, Taşkın. *Battery-Swapping Multi-Agent System for Sustained Operation of Large Planetary Fleets.* 2024 IEEE Aerospace Conference, IEEE, 2024.

C13. **Hanson, Nathaniel**; Pyatski, Benjamin; Hibbard, Samuel; DiMarzio, Charles; Padır, Taşkın. *Hyper-Drive: Visible-Short Wave Infrared Hyperspectral Imaging Data Sets for Robots in Unstructured Environments.* 2023 13th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS). IEEE, 2023.

C14. **Hanson, Nathaniel***; Demirkaya, Ahmet*; Erdoğmuş, Deniz; Padır, Taşkın; Imbiriba, Tales. *A Vision for Cleaner Rivers: Harnessing Snapshot Hyperspectral Imaging to Detect Macro-Plastic Litter.* 2023 13th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS). IEEE, 2023.

C15. Lvov, Gary; Zolotas, Mark; **Hanson, Nathaniel**; Allison, Austin; Hubbard, Xavier; Carvajal, Michael; Padır, Taşkın. *Mobile MoCap: Retroreflector Localization On-The-Go.* IEEE International Conference on Automation Science and Engineering (CASE). IEEE, 2023.

C16. **Hanson, Nathaniel***; Lewis, Wesley*; Puthuveetil, Kavya*; Furline, Donelle; Padmanabha, Akhil; Padır, Taşkın; Erickson, Zackory. *SLURP! Spectroscopy of Liquids Using Robot Pre-Touch Sensing.* IEEE International Conference on Robotics and Automation (ICRA). IEEE, 2023.

C17. **Hanson, Nathaniel**; Shaham, Michael; Erdogmus, Deniz; Padır, Taşkın. *Vast: Visual and spectral terrain classification in unstructured multi-class environments.* 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). IEEE, 2022.

C18. **Hanson, Nathaniel**; Kelestemur, Tarik; Berman, Joseph; Ritzenhoff, Dominik; Padır, Taşkın. *Hyperbot – A Benchmarking Testbed for Acquisition of Robot-Centric Hyperspectral Scene and In-Hand Object Data.* 2022 12th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS). IEEE, 2022.

C19. **Hanson, Nathaniel**; Hochsztein, Hillel; Vaidya, Akshay; Willick, Joel; Dorsey, Kristen; Padır, Taşkın. *In-Hand Object Recognition with Innervated Fiber Optic Spectroscopy for Soft Grippers.* 5th International Conference on Soft Robotics (RoboSoft). IEEE, 2022.

Archive and Preprints

Witt, Mark; **Hanson, Nathaniel**; Taurianen, Andrew. *Enhancing Remotely Piloted Aircraft Endurance: AI-Driven Fuel Planning Optimization. DTIC*, 2025.

Hanson, Nathaniel; Keleştemur, Tarık; Erdoğmuş, Deniz; Padır, Taşkın. *Pregrasp Object Material Classification by a Novel Gripper Design with Integrated Spectroscopy. arXiv*, 2021.

Mensah, Immanuel Ampomah; Healey, Jessica; Wu, Celina; Lacunza, Andrea; **Hanson, Nathaniel**; Dorsey, Kristen. *Hold 'em and Fold 'em: Towards Human-scale, Feedback-Controlled Soft Origami Robots. arXiv*, 2023.

Poster Presentations

Hanson, Nathaniel; Wolak, Mateusz; Richardson, Jonathan; Jafari, Chakameh. *Advancing Accurate Burn Depth Assessment at Injury Onset: An AI-enabled Multimodal Optical Imaging Platform in the Visible and Beyond.* Military Health System Research Symposium; August 2025; Kissimmee, FL

Hanson, Nathaniel; Allison, Austin; Daly, Natalie; DiMarzio, Charles; Padır, Taşkın; Kristen Dorsey. *SCANS: Simultaneous Curvature and Near Infrared Spectroscopy for Soft Grippers.* New England Manipulation Symposium; May 2024; Boston, MA

Hanson, Nathaniel *Let There Be Light! Spectroscopic Sensing in Robotics for Enhanced Mobility and Reasoning.* Society of Catholic Scientists Conference 2024; May 2024; Mundelein, IL

Hanson, Nathaniel*; Roberts, Sonia*; Mensah, Immanuel Ampomah*; Wu, Celine; Healey, Jessica; Dorsey, Kristen. *Controlling the Fold: Proprioceptive Feedback in a Soft Origami Robot.* Late Breaking Results at 7th International Conference on Soft Robotics (RoboSoft); April 2024; San Diego, CA

Hanson, Nathaniel; Allison, Austin; Daly, Natalie; DiMarzio, Charles; Padır, Taşkın; Kristen Dorsey. *SCANS: Simultaneous Curvature and Near Infrared Spectroscopy for Soft Grippers.* Multimodal Soft Robots for Multifunctional Manipulation, Locomotion, and Human-Machine Interaction at 7th International Conference on Soft Robotics (RoboSoft); April 2024; San Diego, CA

Hanson, Nathaniel; De La Garza, Oscar; Padır, Taşkın. *See the Difference: Non-Contact Terrain Property Estimation via Hyperspectral Imaging for Off-Road Mobile Robots.* Northeast Robotics Colloquium (NERC); November 2023; New Haven, CT

Hanson, Nathaniel; Pyatski, Benjamin; Hibbard, Samuel; DiMarzio, Charles; Padır, Taşkın. *HyperDrive: Visible-Short Wave Infrared Hyperspectral Imaging Data Sets for Robots in Unstructured Environments.* Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS); November 2023; Athens, GR.

Hanson, Nathaniel*; Demirkaya, Ahmet*; Erdoğmuş, Deniz; Padır, Taşkın; Imbiriba, Tales. *A Vision for Cleaner Rivers: Harnessing Snapshot Hyperspectral Imaging to Detect Macro-Plastic Litter.* Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS); November 2023; Athens, GR.

Hanson, Nathaniel; Allison, Austin; Dorsey, Kristen; Padır, Taşkın. *Spec-Tact-ular Fabric Perception: Multi-Stage, Multi-Modal Sensing.* IEEE International Conference on Robotics and Automation (ICRA); May 2023; London, UK

Hanson, Nathaniel; Padır, Taşkın. *SLURP! Spectroscopy of Liquids Using Robot Pre-Touch Sen-*

sing. Northeastern University PhD Expo; March 2023; Boston, MA

Hibbard, Samuel; **Hanson, Nathaniel**; Padır, Taşkın. *Conical Compliant Rolling Contact Mechanism for Precision Robotic Wrists.* Northeast Robotics Colloquium (NERC); October 2022; Lowell, MA

Hanson, Nathaniel; Padır, Taşkın. *Pregrasp Object Material Classification by a Novel Gripper Designs with Integrated Spectroscopy - A Precursor to Materially Aware Robotics.* Northeastern University PhD Expo; March 2022; Boston, MA

Hanson, Nathaniel; Julien, Scott; Ozdemir, Ozan; Muftu, Sinan; Padır, Taşkın. *In Situ Characterization of Fundamental Building Blocks for Cold Spray Additive Manufacturing.* Cold Spray Action Team; June 2021; Leominster, MA

CONFERENCE AND WORKSHOP PRESENTATIONS

Promises and Futures for Robotics in Disaster Response and Public Safety. Advanced Technology for Public Safety Workshop, 2024.

Vast: Visual and Spectral Terrain Classification in Unstructured Multi-Class Environments. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022.

Hyperbot – A Benchmarking Testbed for Acquisition of Robot-Centric Hyperspectral Scene and In-Hand Object Data. 12th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS), 2022.

INVITED SEMINARS & COLLOQUIA

Towards Robots that Sense and Act in Unstructured Environments. MIT Horizon, 2025.

See, Sense, Save – Enhancing Perception for Autonomous Systems to Make a Difference. Catholic University of America College of Engineering Seminar Series, 2024.

See, Sense, Save – Enhancing Perception for Autonomous Systems to Make a Difference. University of Notre Dame Robotics and Control Systems Seminar, 2024.

Robots as Agents of Social Good and Partners for Disaster Response – Remote Sensing for Disaster Response Course. MIT LL Beaver Works Summer Institute Seminar, 2024.

Robots as Agents of Social Good and Partners for Disaster Response. MIT LL Beaver Works Summer Institute Seminar – Autonomous Aerial Vehicle Racing Course, 2024.

SLURP! Spectroscopy of Liquids Using Robot Pre-Touch Sensing. Northeastern University Institute for Experiential Robotics Seminar, 2023.

Material Informed Robotics - How Sensing the Stuff Around Us Makes Robots Smarter. University of Notre Dame Computer Science and Engineering Faculty Seminar, 2023.

TEACHING EXPERIENCE

Massachusetts Institute of Technology January 2020 - February 2024

Autonomous Unmanned Aerial Vehicle Racing (Lead Instructor - Beaver Works Summer Institute)

NEET Autonomous Machines 16.84 (Lead Course Engineer)

Learning Machines Executive Education Program (Teaching Staff)

Air Force AI Accelerator Know Apply Lead Cohort at Scale (AI Expert)

University of Notre Dame August 2018 - May 2019

Database Systems CSE 30246 (Teaching Assistant)

Software Development for Unmanned Aerial Systems CSE 40773 (Teaching Assistant)

FUNDING - $667,500 TOTAL / $517,500 DIRECT

Hanson, Nathaniel (PI, MIT LL); Coad, Margaret (Co-PI, University of Notre Dame); *ROOTED: Robotic Observation and Operation in Tight and Enclosed Domains*. Congressional Apportioned Autonomous Systems Line Funding; *Final Submission*.

Hanson, Nathaniel (PI, MIT LL); *Field Studies for Vine Robots in Urban Search & Rescue*. MIT LL Technology Office; Apr 2025 - Oct 2025; Awarded Mar 2025; Budget $65,000.

Hanson, Nathaniel (PI, MIT LL); *Hype2Go: Robot Cost Maps from Hyperspectral Imaging*; May 2025 - Oct 2025; Awarded Apr 2025; Budget $100,000.

Jafari, Chakameh (PI, MIT-LL); **Hanson, Nathaniel (Co-PI, MIT LL)**; *AI-informed Low-SWaP Multimodal Imaging for Burn Classification*; Oct 2024 - Sept 2025; Awarded Sept 2024; Budget $200,000.

Hanson, Nathaniel (PI, MIT LL); Coad, Margaret (Co-PI, University of Notre Dame); *Vine Robots for Collapsed Structure Mapping*; MIT LL Advanced Concepts Committee; $300,000, Apr 2024 - Apr 2025; Awarded Mar 2024; MIT LL Budget $150,000.

Hanson, Nathaniel; Kousens, Zachary; *DeLive: Drones for Aerial Medicine Delivery*; Notre Dame Idea Center Seed Funding; Aug 2018 - May 2019; Awarded Aug 2018; Budget $2,500.

AWARDS & SCHOLARSHIPS

2025 Domer Dozen Selectee - Honored by the Notre Dame Alumni Association for being a force for good in the world and having made significant contributions in faith, service, learning, or work.

Runner-Up, 2023 Soft Robotics Toolkit Competition

Outstanding Graduate Student Award - Recognized amongst the entire graduate student body at Northeastern for the integration of experiential research into doctoral education.

2023 Huntington 100 Member - Selected as 1 of 100 most influential students at Northeastern University for achievements commensurate with the university's mission, ideals, values, and academics.

Northeastern University PhD Network Travel Grant

National Hurricane Conference Outstanding Achievement Award - Selected for developing a state-of-the-art tool to enable emergency managers to develop simulated tropical cyclone scenarios to test a range of response and recovery situations.

Department of Energy E-Robot Finalist - Developed a holistic robotic solution to support home crawlspace retrofit. Included in top 10/67 submissions.

MIT Team Award (2025) - For mentorship to the Intern Innovation Idea Challenge (i3C)

MIT Team Award (2021) - For rapid curriculum redevelopment efforts in support of the Beaver Works Summer Institute

MIT Team Award (2020) - For outstanding service to MIT LL COVID-19 relief efforts and the Privacy Award Contact Tracing (PACT) project

ACC InVenture Prize Finalist - Startup DeLive recognized as one of the top three startups among schools in the Atlantic Coast Conference through televised competition

McCloskey Prize Finalist - Selected from +130 startup companies in the South Bend/Notre Dame community as a top 7 team for our combination of technical development, business plan, and overall ideation

Project Global Officer Awardee - Selected to receive intensive foreign language training at internationally regarded universities in the United States and abroad

University of Notre Dame Engineering Scholars Program - 1/19 students selected for advanced interdisciplinary studies in the College of Engineering's class of 2019

University of Notre Dame Provost's Scholarship (2015-2019; 8 semesters)

University of Notre Dame University Scholarship (2015-2019; 8 semesters)

QuestBridge College Prep Scholar

PATENTS

Systems and Methods for Calibrating Sensors Under Varying Environmental Conditions. U.S. Patent Application, 19/205,139, filed May 13, 2024. Patent pending.

System and Method for Determining One of More Properties of an Object. U.S. Patent Application, 18/990,171, filed Dec 20, 2024. Patent pending.

System and Method for Manipulating Deformable Objects. U.S. Patent Application, 18/933,478, filed Oct 31, 2024. Patent pending.

Systems and Methods for Robotic Grippers With Fiber Optic Spectroscopy. U.S. Patent Application, 18/165,707, filed Feb 7, 2023. Patent pending.

SERVICE TO THE DISCIPLINE

Conference Reviewer: IEEE International Conference on Soft Robotics; IEEE International Conference on Robotics and Automation (ICRA); IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS); IEEE Conference on Automation Science and Engineering; International Symposium on Experimental Robotics (ISER); IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR)

Conference Editor: (Associate Editor) IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR)

Journal Reviewer: IEEE Transactions on Robotics; IEEE Robotics and Automation Letters; Applied Intelligence; IEEE Transactions on Automation Science and Engineering; MIT Science Policy Review; Frontiers in Robotics and AI; Journal of Field Robotics

Grant Reviewer: Advanced Research Projects Agency for Health (ARPA-H)

Judge: Verizon Disaster Resilience Prize, MIT Solve

Organizer: IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR) - (2024 & 2025); Soft Robots for Humanitarian Assistance, Reconnaissance, Disasters, Exploration, and Recovery (HARDER) @ RoboSoft 2025.

SERVICE TO THE INSTITUTION

Thesis Committee: Prajapati, Sarvesh; Risk-Aware Planner for Robots Incorporating Perceptual-Aware Spectral Analysis, Northeastern University Master's of Science in Robotics, 2024.

Student Panelist: Faculty Search Committee, Northeastern University

Student Panelist: Institute Lab Manager Search Committee, Northeastern University

Mentor: Intern Innovative Idea Challenge (I3C), MIT LL; Department of the Air Force - MIT AI Accelerator (DAF-MIT AIA) Phantom Fellowship Program

Panelist: College of Engineering First-Year Alumni Panel, University of Notre Dame

PROFESSIONAL MEMBERSHIPS

Member, IEEE

Member, Robotics and Automation Society

Member, Society of Catholic Scientists

Member, Order of the Engineer

CONTINUING EDUCATION & CERTIFICATIONS

The Inclusive STEM Teaching Project. edX, 2024.

Mathematics of Big Data & Machine Learning, MIT IAP, 2025.

ACADEMIC MENTORING

Alvarez Valdivia, Antonio; Graduate - Purdue/MIT LL; Field Studies for Vine Robots in Urban Search & Rescue. Summer 2025.

Taurianen, Andrew; Postgraduate - USAF/MIT LL; UAS Energy Optimization. Spring 2025.

Witt, Mark; Postgraduate - USAF/MIT LL; UAS Energy Optimization. Winter 2025.

Georgiou, Charis; Undergraduate - MIT/MIT LL; Conformal Prediction for Optimization Informed Keypoint Placement. Fall 2024.

Fears, Ayron; Graduate - Howard/MIT LL; SLAM algorithm development for confined, unstructured spaces. Summer 2024.
Initial Placement: Research Fellow at US Army DevCom

Dhawan, Ankush; Graduate - Stanford/MIT LL; Multi-modal sensor head design for vine robots operating in collapsed structures. Summer 2024.
Initial Placement: PhD Student in Electrical Engineering at Stanford University

Byrne, Lisa; Undergraduate - Northeastern; Autonomous aquatic vehicle with hyperspectral imaging for invasive species identification and mapping. Fall 2023.
Initial Placement: Software Development Engineer at Amazon Robotics

Daly, Natalie; Graduate - Northeastern; Software infrastructure for soft finger actuation and curvature measurement. Fall 2023.

Mensah, Immanuel Ampomah; Graduate - Northeastern; Design of multi-chamber Kresling structure for underwater locomotion. Summer/Fall 2023.
Initial Placement: PhD Student in Robotics at Cornell University

Lewis, Wesley; Undergraduate - University of Virginia; Machine learning for interrogation of liquids in concealed containers with spectroscopy. Summer 2022; Summer 2023.
Initial Placement: Computer Scientist at Marine Corps Systems Command

Holand, Ethan; Undergraduate - Northeastern; Design of sensors for surface analysis using robot manipulators and reflectance spectroscopy. Spring 2023.
Initial Placement: Master of Science in Robotics at Carnegie Mellon

Hibbard, Samuel; Undergraduate - Northeastern; Design of optical housings for outdoor hyperspectral sensing. Spring 2023.
Initial Placement: Master of Science in Mechanical Engineering at Northeastern University

Rautela, Vedant; Undergraduate - Northeastern; Semantic segmentation of hyperspectral data captured from a moving vehicle in urban and suburban environments. Spring 2023.
Initial Placement: Software Engineer at KoBold Metals

Pyatski, Benjamin; Undergraduate Co-Op - Northeastern; System architectures and drivers for real-time snapshot hyperspectral data analysis from a moving vehicle. Spring 2023.

Igbinedion, Ifueko Nosakhare; Graduate - MIT/MIT LL; Teaching assistant for Autonomous Air Vehicle Racing with Beaver Works Summer Institute (BWSI). Summer 2022.

Schofield, Matthew; Graduate - MIT/MIT LL; Teaching assistant for Autonomous Air Vehicle Racing with Beaver Works Summer Institute (BWSI). Summer 2022.
Initial Placement: Officer in United States Air Force

Abdulhai, Rumaisa; Undergraduate - MIT/MIT LL; Teaching assistant for Autonomous Air Vehicle Racing with Beaver Works Summer Institute (BWSI). Summer 2022.

Furline Jr., Donelle; Undergraduate - Northeastern; Ground truth motion capture system for soft robotic grippers. Summer 2022.

Lvov, Gary; Undergraduate - Northeastern; Automated hyperspectral anomaly detection in cluttered environments; Infrared Marker Tag Detection. Summer 2022; Spring - Summer 2023.
Initial Placement: PhD Student at Brown University

Healey, Jessica; Undergraduate Co-Op - Northeastern; Design and construction of a biodegradable waste collection robot constructed from cork. Spring 2022.
Initial Placement: PhD Student at University of California, San Diego

Berman, Joseph; Undergraduate - Northeastern; Hardware interface and control of a linear rail actuator for a robot manipulator. Spring 2022.
Initial Placement: Master of Science in Computer Engineering at Northeastern University

Ritzenhoff, Dominik; Undergraduate - Northeastern; Fundamentals of manipulation and point cloud processing. Spring 2022.
Initial Placement: Masters Student at Technical University of Munich

North, Christian; Undergraduate - Middlesex CC/MIT LL; Teaching assistant for Autonomous Air Vehicle Racing with Beaver Works Summer Institute (BWSI). Summer 2021.

Joyce, Kiernan; Graduate - WPI/MIT LL; Teaching assistant for Autonomous Air Vehicle Racing with Beaver Works Summer Institute (BWSI). Summer 2021.
Initial Placement: Systems Engineer at Raytheon

Giacalone, Giovanni; Undergraduate - WPI/MIT LL; Teaching assistant for Autonomous Air Vehicle Racing with Beaver Works Summer Institute (BWSI). Summer 2021.

TECHNICAL SKILLS

Computer Languages	C/C++, MATLAB, Python, Java, Scala, JavaScript
Software & Tools	ROS, ArcGIS, ENVI, Gazebo, Jupyter Notebook, LaTeX
Skills	System Design, Sensor Integration, Computer Vision

RELEVANT COURSEWORK

Core Courses
Mobile Robotics
Field Robotics
Hyperspectral Imaging
Robotic Science & Systems
Robotics, Sensing, & Navigation
Software Development for Unmanned Aerial Systems

Other Courses
Machine Learning
Remote Sensing
Reinforcement Learning
Analysis of Algorithms
Artificial Intelligence
Software Engineering

MEDIA COVERAGE & APPEARANCES

"A Hose-shaped Robot that Searches through Rubble, Using Air Pressure to Move in Any Direction", XTech, https://xtech.nikkei.com/atcl/nxt/mag/rob/18/00006/00173/

"How can first responders safely save people trapped under rubble? This vine-like robot may be the answer", CNN, https://www.cnn.com/2025/04/04/science/video/vine-robot-mit-notre-dame-digvid

"A flexible robot can help emergency responders search through rubble", MIT News, https://news.mit.edu/2025/sprout-flexible-robot-help-emergency-responders-search-rubble-0402

"A New Flexible Robot Helps Emergency Responders Search Through Rubble", MIT Lincoln Laboratory, https://www.ll.mit.edu/news/new-flexible-robot-helps-emergency-responders-search-through-rubble

"Vine Robots for Collapsed Structure Mapping", MIT Lincoln Laboratory, https://www.ll.mit.edu/r-d/projects/vine-robots-collapsed-structure-mapping

"Lincoln Laboratory Stories: Nathaniel Hanson", MIT Lincoln Laboratory, https://www.ll.mit.edu/about/laboratory-stories/nathaniel-hanson

"Tech-savvy Catholics embrace Carlo Acutis: "Saintliness is possible in this modern era"", Catholic News Agency, https://www.catholicnewsagency.com/news/257930/tech-savvy-catholics-embrace-carlo-acutis-saintliness-is-possible-in-this-modern-era

"United States Air Force and Space Force members visit MIT for immersive learning experience", MIT Open Learning, https://openlearning.mit.edu/news/united-states-air-force-and-space-force-members-visit-mit-immersive-learning-experience

"An invasive plant is strangling Connecticut's waters, so these students developed a robotic boat to help fix it", Northeastern Global News, https://news.northeastern.edu/2023/12/14/hydrilla-plant-invasive-connecticut/

"DAF-AI Accelerator hosts Learning Machines Course with MIT Media Lab", DAF AI Accelerator News, https://www.aiaccelerator.af.mil/News/News-Article-View/Article/3249881/daf-ai-accelerator-hosts-learning-machines-course-with-mit-media-lab/

"Video Friday: Robot Friends", IEEE Spectrum, https://spectrum.ieee.org/video-friday-robot-friends

"NU Team PARIS Wins in Phase 1 of American-Made E-ROBOT Prize", Northeastern College of Engineering News, https://coe.northeastern.edu/news/nu-team-paris-wins-in-phase-1-of-american-made-e-robot-prize/

"Behind the Scenes of Contact Tracing Study", TEDx MIT, https://youtu.be/wz6tedCAEkc

"Defibrillators by Drone", University of Notre Dame News, https://engineering.nd.edu/news/defibrillators-by-drone/

"Prospective Student Startup Aims to Save Lives by Delivering Defibrillators by Drone", https://ideacenter.nd.edu/news-events/news/prospective-student-startup-aims-to-save-lives-by-delivering-defibrillators-by-drone/

COMMUNITY SERVICE

Volunteer, St. Mary of the Assumption Catholic Parish, Brookline, Massachusetts

Volunteer, Kids Day, MIT Lincoln Laboratory

Mentor, ESTEEM Master's Degree Program, University of Notre Dame

Musician, Band of the Fighting Irish, University of Notre Dame

REFERENCES

Dr. Kristen Dorsey
Associate Professor
Department of Electrical and Computer Engineering
Northeastern University
k.dorsey@northeastern.edu

Dr. Taşkın Padır
Amazon Scholar/Professor
Institute for Experiential Robotics
Northeastern University
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