Priyankari Perali

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EDUCATION

Texas A&M University, College Station, Texas
Master of Science, Computer Science May 2025
Thesis: Unprompted Touch by a Victim with a Search and Rescue Robot
Advised by: Robin Murphy, Ph.D

The Ohio State University, Columbus, Ohio
Bachelor of Science, Computer Science and Engineering (Artificial Intelligence) May 2022
Humanitarian Engineering Scholar

PUBLICATIONS

1. **Priyankari Perali***, Thomas Manzini*, Robin Murphy, and David Merrick. Challenges and Research Directions from the Operational Use of a Machine Learning Damage Assessment System via Small Uncrewed Aerial Systems at Hurricanes Debby and Helene. In 2025 International Conference on Robot & Human Interactive Communication. 2025 (*equal contribution)(*To Appear*)
2. **Priyankari Perali***, Thomas Manzini*, Raisa Karnik, Mihir Godbole, Hasnat Abdullah, and Robin Murphy. Non-Uniform Spatial Alignment Errors in sUAS Imagery From Wide-Area Disasters. In 2025 International Conference on Robot & Human Interactive Communication. 2025 (*equal contribution)(*To Appear*)
3. Thomas Manzini, **Priyankari Perali**, Jayesh Tripathi, and Robin Murphy. Now you see it, Now you don't: Damage Label Agreement in Drone & Satellite Post-Disaster Imagery. In Proceedings of the 2025 ACM Conference on Fairness, Accountability, and Transparency (pp. 1998-2008)
4. Thomas Manzini**, Priyankari Perali**, Raisa Karnik, and Robin Murphy. Crasar-u-droids: A large scale benchmark dataset for building alignment and damage assessment in georectified suas imagery, 2025. Scientific Reports (*Under Review*)
5. **Priyankari Perali** and Robin Murphy, Unprompted Touch with Touch Surface Characteristics: A Survey. 2024. ACM Transactions on Human-Robot Interaction (THRI) (*Under Review*)
6. Thomas Manzini, **Priyankari Perali**, and Robin R Murphy. Three challenges in utilizing machine learning to predict human behavior from observational data. In Companion of the 2024 ACM/IEEE International Conference on Human-Robot Interaction, pages 737–739, 2024
7. **Priyankari Perali***, Lance G Fletcher*, Andrew Beathard, and Jason M O'Kane. A visibility-based escort problem. In 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pages 4804–4811. IEEE, 2023. (*equal contribution)

RESEARCH & WORK EXPERIENCE

U.S. DEVCOM Army Research Laboratory, Aberdeen Proving Ground, MD June 2025 – Present
Research Intern for the Resource Constraint Adaptive Computing (RCAC) Group

- Developing data fusion models for perception and language models on-device for UGVs in constrained and complex environments
- Optimized VLMs and LLMs with quantization techniques (e.g., AWQ), enabling inference on-device deployments within field deployments
- Achieved 50% reduction in GPU memory usage, expanding deployment options to lower-cost devices
- Evaluated performance trade-offs using ROS Bag data from field testing; visualized results with RVIZ

Texas A&M University, College Station, TX January 2023 – June 2025
Graduate Research Assistant for the Humanitarian Robotics and Artificial Intelligence Laboratory (HRAIL)

- Curated CRASAR-U-DRIODS, the largest dataset of drone orthomosaic disaster imagery for building damage and road damage assessments, and spatial alignment
- Extended dataset with satellite and crewed aerial imagery for multimodal model training; released open-source via Hugging Face
- Evaluated distribution differences across image sources to improve transparency and fairness in ML models
- Developed 3+ PyTorch Benchmark models (CNNs, Transformers, etc.), achieving 150% relative improvement over baseline models
- Reduced model inference times to 5 minutes, aiding emergency decision-making

- Deployed developed damage assessment models for disaster response operations for 2 disasters with PEMA and the Florida State Emergency Response Team
- Defined ML objectives with a 6-person multidisciplinary team for predicting human error in high-risk environments
- Built data pipelines and ML models predicting human behavior in procedural tasks, improving predictions by 2x over baseline models
- Led human subject studies to evaluate 4 robot designs via a within-subject study consisting of 34 participants
- Conducted qualitative and quantitative analysis from video coded and questionnaire responses to determine statistical significance and participant affective impressions
- Organized STEM outreach, introducing 270+ students to machine learning and computer vision for disaster response

Cardinal Health, Columbus, OH May 2021 – August 2021
Information Technology Intern for the Digital Solutions Team

- Centralized Cardinal Health's external and internal data sources with Google Cloud Platform, minimizing data retrieval time
- Built AtScale-based data visualizations and integrated data pipelines, enabling supply chain optimization and machine learning initiatives

Huntington National Bank, Columbus, OH June 2020 – August 2020
Programmer Intern

- Resolved 10+ software vulnerabilities using Veracode, strengthening internal loan application security
- Migrated internal SharePoint site, increasing resource accessibility for 8+ employees
- Redesigned internal Huntington employee resources, easing navigation for 100+ employees

Northwoods, Dublin, OH January 2018 – May 2018
Student Intern

- Implemented and contributed testing code to test Northwood web and mobile services of social services

SKILLS

- **Programming Languages:** Python, C++, Java, C, HTML, JavaScript, R
- **Frameworks & Libraries:** PyTorch, TensorFlow, ROS, ROS 2.0, CUDA
- **Cloud & Platforms:** Google Cloud Platform (GCP), AtScale

TALKS & PRESENTATIONS

Computer Vision/Machine Learning and Human-Robot Interaction for Disaster Response June 2025
U.S. DEVCOM Army Research Laboratory, Aberdeen Proving Ground

Using AI to Assess Hurricane Damage November 2024
Weather Geeks Podcast

CRASAR: A Large Scale Benchmark Dataset for Building Alignment and Damage Assessment in Georectified sUAS Imagery September 2024
Military Operations Research Society (MORS)

CRASAR: A Large Scale Benchmark Dataset for Building Alignment and Damage Assessment in Georectified sUAS Imagery August 2024
MIT Lincoln Laboratory

Unprompted Touch Interaction between a Victim and Search and Rescue Robot in a Disaster April 2024
Texas Regional Robotics Symposium (TEROS)

Three Challenges in Utilizing Machine Learning to Predict Human Behavior from Observational Data March 2024
Companion of the 2024 ACM/IEEE International Conference on Human-Robot Interaction

SERVICE, LEADERSHIP & TEACHING

Website Co-Chair, Society of Women Engineers August 2021 – May 2022
The Ohio State University

Peer Mentor, Humanitarian Engineering Scholars Program August 2021 – May 2022
The Ohio State University

Teaching Assistant for Intro to C++ Programming January 2020 – January 2022
The Ohio State University

Professional Development Co-Chair, Humanitarian Engineering Scholars Program August 2019 – May 2020
The Ohio State University

REVIEWS

IEEE/RSJ International Conference on Intelligent Robots and Systems 2024
ACM/IEEE International Conference on Human-Robot Interaction 2024

AWARDS

First Place, First-Year Engineering Design Showcase Track Competition May 2019