

♣ The complete list of sections below are available on my LinkedIn ([link](#)) or full CV ([link](#)).

## OVERVIEW

Experienced patented engineer with a strong background in AI, robotics, and aviation. Explored robotics topics in perception uncertainty, autonomy, localization, mapping, deep learning (DL), sensor modeling, optimization, planning, decision-making, and reinforcement learning (RL). Developed and patented frameworks for perception uncertainty that enhance the safety and reliability of robots (like cars, drones, and humanoids). Eager to leverage expertise to drive innovation and have a real-world impact.

**\*\*U.S. Citizen and eligible for clearances.\*\***

## SELECTED SKILLS, LICENSES, & CERTIFICATIONS♣

|                                 |  |
|---------------------------------|--|
| <b>Technologies &amp; Tools</b> | Machine Learning (PyTorch, scikit-learn), Generative AI (LLMs, LVMs), Computer Vision (OpenCV, CNNs), Git, ROS, ArUco, AprilTag, Simulators (Gazebo, Unity3D, Unreal Engine), FMEA |
| <b>Programming</b>              | Python, C/C++, Multi-threading, Cython, C#, MATLAB, SQL, Bash, Java, LaTeX, JavaScript, HTML, CSS, PHP   |
| <b>Robots and Devices</b>       | DJI Inspire/Matrice, Turtlebot, VOXL m500, GPS, Intel RealSense, LiDAR, Vicon MCS, MAVROS, Intel Neural Stick, PX4, Crazyflie, Arduino   |
| <b>Licenses</b>                 | Private Pilot License w/ Instrument and Multi-Engine ratings + Complex Endorsement   |
| <b>Operating Systems</b>        | Linux, Mac OS, Windows, VirtualBox, VMWare, Docker   |
| <b>Communication</b>            | English (native), Spanish & German (elementary level), Mentoring, Grant Writing, Project Management  |

## SELECTED EXPERIENCE♣

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|--|--|-----------------------|
| <i>University of Maryland</i> (College Park, MD)   | <b>Postdoctoral Research Fellow and Instructor</b> | Dec. 2021 — Present   |
| <ul style="list-style-type: none"><li>Driving an independent line of research exploring various topics—several topics are mentioned in the “Overview” section above.</li><li>Designing novel AI frameworks for robot perception (including misclassifications with YOLO (Python)) using Generative AI, simulated data, and real data. Deploying solutions on drones and ground vehicles in simulation and the real world.</li><li>Managed 6+ cross-functional student teams to publish at premier robotics conferences and authored grant proposals for Samsung, Amazon, and NSF.</li><li>Instructed “CMSC 426: Computer Vision” in Summer 2025.</li></ul> |  |                       |
| <i>University of South Florida</i> (Tampa, FL)   | <b>Doctoral Research and Teaching Assistant</b>    | Jan. 2016 — Dec. 2021 |
| <ul style="list-style-type: none"><li>Developed and patented a novel perception uncertainty framework for camera and LiDAR sensors.</li><li>Engineered sensor models using simulated and real data for localization and deployed models to aerial and ground robots.</li><li>Mentored 5+ students, supervised a student deploying the YOLO object detector for a robotics company, assisted in teaching, led various community outreach activities, and authored grants for Ford Foundation, Amazon, Microsoft, FDACS, and USAID.</li></ul>  |  |                       |
| <i>Intel Corporation</i> (Santa Clara, CA)   | <b>Software Development Intern</b>                 | Jun. 2018 — Aug. 2018 |
| <ul style="list-style-type: none"><li>Worked within Intel FLEX-IT and AIPG to develop a pre-silicon simulator.</li><li>Contributed to nGraph, an open-source C++ deep learning compiler designed to optimize the computation of neural networks.</li><li>Implemented optimized computational operations and ensured execution correctness for deep learning models in simulations.</li></ul>   |  |                       |
| <i>Cisco</i> (Santa Jose, CA)  | <b>Software Development Intern</b>                 | Jun. 2015 — Aug. 2015 |
| <ul style="list-style-type: none"><li>Analyzed intelligent wireless sensor network protocols for event detection and aggregation in conversation parks.</li><li>Produced a technical white paper that qualitatively evaluated each protocol’s effectiveness and robustness under realistic cases.</li></ul>  |  |                       |
| <i>Norfolk State University</i> (Norfolk, VA)  | <b>Graduate Research and Teaching Assistant</b>    | Aug. 2012 — Dec. 2013 |
| <ul style="list-style-type: none"><li>Created Tekkodu (<a href="#">link</a>), a programming framework enabling intuitive control of autonomous robotic manipulators.</li><li>Reverse engineered and formalized how Microsoft Kodu Game Lab works—one of the first works to do so.</li><li>Bridged the behavioral gap between a simulated Kodu character and a physical robot using innovative strategies written in C++.</li></ul>   |  |                       |
| <i>NASA-Johnson Space Center</i> (Houston, TX)   | <b>Software Development Intern</b>                 | Aug. 2011 — Dec. 2011 |
| <ul style="list-style-type: none"><li>Enhanced Project Morpheus’ Predictor Guidance software package with legacy NASA (C++) code and authored a best-practices guide to streamline team onboarding.</li><li>Streamlined the analyses for a new rocket engine within the propulsion group.</li><li>Presented products to the Morpheus team, EG6’s branch chief, and EG’s deputy and division chiefs.</li></ul>  |  |                       |
| <i>Air Force Research Laboratory</i> (Fairborn, OH)  | <b>Software Development Intern</b>                 | Aug. 2011 — Dec. 2011 |
| <ul style="list-style-type: none"><li>Developed an advanced point-to-point navigation tool (C#) that leveraged GPS and head tracking sensors to simulate real-world soldier training scenarios.</li><li>Supported the development of a real-time multi-user combat simulation environment.</li></ul>   |  |                       |

## EDUCATION

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|---|-----------------------|
| Doctorate of Philosophy (Ph.D.) in Computer Science and Engineering, <i>University of South Florida</i> | Aug. 2015 — Dec. 2021 |
| Master of Science (M.Sc.) in Computer Science, <i>Norfolk State University</i>                          | Jan. 2012 — Jun. 2014 |
| Bachelor of Science (B.Sc.) in Computer Science, <i>University of the Virgin Islands</i>                | Aug. 2007 — May 2011  |

## SELECTED PUBLICATIONS

1. **Troi Williams**. “The SET Perceptual Factors Framework: Towards Assured Perception for Autonomous Systems.” *Workshop on Public Trust in Autonomous Systems—The 2025 IEEE International Conference on Robotics & Automation*, 2025. ([Paper link](#))  
Topics: Perception Uncertainty, AI, Simulation, Sensor Modeling & Optimization. **Position Paper in Robotics**.
2. Chak Lam Shek, Kasra Torshizi, **Troi Williams**, and Pratap Tokekar. “When to Localize? A Risk-Constrained Reinforcement Learning Approach.” *American Control Conference (ACC)*, 2025. ([Paper link](#))  
Topics: Localization, Planning, Decision-Making, Reinforcement Learning.
3. **Troi Williams**, Kasra Torshizi, and Pratap Tokekar. “When to Localize?: A POMDP Approach.” *IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR)*, 2024. ([Paper link](#))  
Topics: Localization, Planning, Decision-Making. **Best Poster at 2023 MRS**.
4. **Troi Williams**, Po-Lun Chen, Sparsh Bhogavilli, Vaibhav Sanjay, and Pratap Tokekar. “Where Am I Now? Dynamically Finding Optimal Sensor States to Minimize Localization Uncertainty for a Perception-Denied Rover.” *International Symposium on Multi-Robot & Multi-Agent Systems (MRS)*, 2023. ([Paper link](#))  
Topics: Perception Uncertainty, Target Localization, Planning, Sensor Modeling & Optimization, Multi-Agent Systems.
5. Harnaik Dhami, Kevin Yu, **Troi Williams**, Vineeth Vajipey, and Pratap Tokekar. “GATSBI: An Online GTSP-Based Algorithm for Targeted Surface Bridge Inspection.” *International Conference on Unmanned Aircraft Systems (ICUAS)*, 2023. ([Paper link](#))  
Topics: Localization, Planning, Deep Learning, Mapping, Sensor Optimization, Sensor Fusion.
6. **Troi Williams** and Yu Sun. “Learning State-Dependent Sensor Measurement Models with Limited Sensor Measurements.” *IEEE International Conference on Robots and Systems (IROS)*, 2021. ([Paper link](#))  
Topics: Perception Uncertainty, Localization, Transfer Learning, Sensor Modeling. **2021 RSS Pioneers Award**.
7. **Troi Williams** and Yu Sun. “Learning State-Dependent Sensor Measurement Models for Localization.” *IEEE International Conference on Robots and Systems (IROS)*, 2019. ([Paper link](#))  
Topics: Perception Uncertainty, Localization, Deep Learning, Sensor Modeling. **Patented**.

## SELECTED AWARDS & PATENTS

|  |                              |
|--|------------------------------|
| The Presidential Postdoctoral Fellowship, <i>University of Maryland</i>  | Apr. 2024 — Present          |
| The PROMISE Academy Fellowship, <i>University of Maryland</i>  | Apr. 2024 — May 2025         |
| CRA Computing Innovation Fellowship (CIFellow), <i>University of Maryland</i>                                    | Sept. 2021 — Apr. 2024       |
| RSS Pioneer Award, <i>Robotics: Science and Systems Conference</i>   | Jul. 2021                    |
| Learning State-Dependent Sensor Measurement Models for Localization, <i>U.S. Patent</i> ( <a href="#">link</a> ) | Feb. 2020                    |
| Dissertation Grant, <i>Microsoft Research</i>  | Aug. 2019 — Jul. 2020        |
| Invitation to the 2nd Round—Combating Zika and Future Threats Grand Challenge, <i>USAID</i>                      | Jul. 2016                    |
| Ph.D. Fellowships, <i>Florida Education Fund • Alfred P. Sloan Foundation • National GEM Consortium</i>          | During Aug. 2015 — Dec. 2021 |
| 2nd Place, <i>2014 ARTSI Robotics Competition (Tapia Conference)</i>   | Feb. 2014                    |
| Winner, <i>2013 ARTSI Robotics Competition</i>   | Mar. 2013                    |
| Honorary Top Computer Scientists Award, <i>University of the Virgin Islands</i>                                  | 2010                         |

## SELECTED LEADERSHIP ACTIVITIES

|   |                        |
|---|------------------------|
| Reviewer, <i>IEEE (ICRA, IROS, SSRR, Transactions-ASE) • IFRR (ISER, ISRR) • ACM (SAC)</i>              | 2019–2025              |
| IRMAS Track Program Committee, <i>The 40th ACM/SIGAPP Symposium on Applied Computing</i>                | Oct. 2024 — Apr. 2025  |
| Doctoral Mentoring Program, <i>University of Maryland</i>   | Feb. 2024 — May 2024   |
| Pioneers Workshop Program Committee, <i>The Robotics: Science and Systems Conference</i>                | Nov. 2022 — Jun. 2023  |
| Postdoctoral Symposium Planning Committee, <i>University of Maryland</i>                                | Jul. 2022 — Sept. 2022 |
| Range Sensing Session Chair, <i>The IEEE International Conference on Intelligent Robots and Systems</i> | Sept. 2021             |
| Resource and Event Coordinator, <i>University of South Florida</i>                                      | Aug. 2020 — May 2021   |
| USF College of Engineering Representative, <i>The 2017 Florida Automated Vehicle Summit</i>             | Nov. 2017              |
| USF Graduate School Recruiter, <i>The National Society of Black Engineers’ 43rd Annual Convention</i>   | Nov. 2017              |
| Undergraduate Student Mentor, <i>Norfolk State University</i>   | Aug. 2012 — Feb. 2014  |

## SELECTED PROFESSIONAL ORGANIZATIONS

|   |                       |
|---|-----------------------|
| Black in Robotics   | Sept. 2020 — Present  |
| Institute of Electrical and Electronics Engineers (IEEE) • IEEE Robotics and Automation Society (RAS) | Jun. 2019 — Present   |
| Black in Artificial Intelligence  | Jun. 2019 — Present   |
| National Society of Black Engineers   | Mar. 2017 — Mar. 2018 |