Troi Williams

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Education

University of South Florida (USF), Tampa Bay, USA.
Ph.D. in Computer Science and Engineering, Aug. 2015 — Dec. 2021.
Advisor: Dr. Yu Sun.
Thesis: *Learning State-Dependent Sensor Measurement Models To Improve Robot Localization Accuracy.*

Norfolk State University (NSU), Norfolk, USA.
M.S. in Computer Science, Jan. 2012 — Jul. 2014.
Advisor: Dr. Thorna Humphries.
Thesis: *Rule-Based Programming and the Future of Robotic Toys.*

University of the Virgin Islands (UVI), St. Thomas, USA.
B.S. in Computer Science, Aug. 2007 — May 2011.
Advisor: Dr. Marc Boumedine.

Employment

Post-Doctoral Researcher, Sept. 2021 — Present.
Robotics Algorithms & Autonomous Systems, University of Maryland at College Park, USA.
Supervisor: Pratap Tokekar

Graduate Intern, Jun. 2018 — Aug. 2018.
FLEX-IT and Artificial Intelligence Product Group (AIPG), Intel Corporation, Santa Clara, USA.

Graduate Research Assistant, Aug. 2015 — Dec. 2021.
Robot Perception and Action (RPAL) Lab, University of South Florida, Tampa Bay, USA.
Supervisor: Yu Sun

Graduate Intern, Jun. 2015 — Aug. 2015.
Chief Technology and Architecture Office (CTAO), Cisco Systems, Inc., San Jose, USA.

Instructor, Aug. 2014 — Dec. 2014.
Community Engagement and Lifelong Learning, University of the Virgin Islands, St. Thomas, USA.

Professional Tutor, Feb. 2014 — May 2015.
Center for Student Success, University of the Virgin Islands, St. Thomas, USA.

Graduate Research Assistant, Aug. 2012 — Dec. 2013.
Department of Computer Science, Norfolk State University, Norfolk, USA.
Supervisor: Thorna Humphries

Graduate Research Assistant, Jun. 2012 — Aug. 2012.
Information Assurance Research, Education, and Development Institute, Norfolk State University, Norfolk, USA.
Supervisor: Jonathan Graham

Intern, Aug. 2011 — Dec. 2011.
Project Morpheus Team, Engineering Directorate (EG), NASA-Johnson Space Center, Houston, USA.
Supervisor: Tim Crain

Undergraduate Intern, Jun. 2010 — Aug. 2010.
Multimodal Wearable Interfaces Branch, Human Effectiveness Directorate, Air Force Research Lab, Fairborn, USA.

Undergrad Research Assistant, Jun. 2009 — May 2010.
Department of Mathematics and Science, University of the Virgin Islands, St. Thomas, USA.
Supervisor: Marc Boumedine

Teaching

1. **Teaching Assistant**, Department of Computer Science and Engineering, University of South Florida.
   - CIS 6930: Neural Networks and Deep Learning (in-person course) Sp '18
   - CAP 4063: Web Applications Design (in-person course) Fa '17
   - CIS 4083: Cloud Computing for IT (hybrid course) Fa '17
2. **Instructor**, Department of Computer and Computational Sciences, University of the Virgin Islands.
   - CSC 117: Intro to Programming I Lab (in-person course) Fa '14, Sp '15
3. **Instructor**, Community Engagement and Lifelong Learning, University of the Virgin Islands.
   - SAT Preparatory Course (in-person course) Fa '14
   - ParaPro Preparatory Course (in-person course) Fa '14
4. **Teaching Assistant**, Department of Computer Science, Norfolk State University.
   - CSC 467: Advanced Computer Topics II (Robotics) (in-person course) Fa '13

Recognition

Awards

Best Poster Award, 2023 IEEE International Symposium on Multi-Robot & Multi-Agent Systems (MRS)	Dec. 2023
Winner, 2022 University of Maryland Postdoctoral Symposium Poster Presentation Competition	Sept. 2022
2021 Computing Innovation Fellow (CIFellow)	Sept. 2021
The Koerner Family Foundation Fellowship (Class 2021)	Jan. 2021
The 2020 CRA–Widening Participation's Graduate Cohort Workshop for URMD Scholarship	Mar. 2020
The 2019 Microsoft Research Dissertation Grant	Aug. 2019
The 2019 CRA's Graduate Cohort Workshop for URMD Scholarship	Mar. 2019
Tapia 2016 Scholarship	Sept. 2016
The Florida–Georgia LSAMP Bridge to the Doctorate Project NSF Fellowship	Aug. 2015
The Florida Education Fund's McKnight Doctoral Fellowship (*Started Aug. 2017*)	Aug. 2015
The National GEM Consortium Doctoral Fellowship	Aug. 2015
Alfred P. Sloan Foundation's Minority Ph.D. Program's Sloan Scholar	Aug. 2015
2nd Place, 2014 ARTSI Robotics Competition (Tapia Conference)	Feb. 2014
Tapia 2014 Scholarship	Feb. 2014
Winner, 2013 ARTSI Robotics Competition	Mar. 2013
NSU Computer Science Master's Research Assistantship Scholar	Jan. 2012
Thurgood Marshall College Fund Scholar	2010
UVI Honorary Top Computer Scientists Award	2010
Computer Science Poster Presentation Winner, The 2009 HBCU-UP National Conference	Oct. 2009
Historically Black Colleges and Universities-Undergraduate Program (HBCU-UP) Scholar	2009
Emerging Caribbean Scientist Scholar, Tutor, and Researcher Scholar	Aug. 2008

Publicity

Postdoc Troi Williams was interviewed by Alhurra News on robotics [link]	Oct. 2022
CI Fellow Working to Improve Robotic Sensing Capabilities [link], [link]	May 2022
CSE PhD Student Troi Williams Receives Koerner Family Foundation Research Award [link], [link]	Jan. 2021
UVI Cybersecurity Workshop Prepares Students to Become Cyber Defenders [link]	Jul. 2019
Troi Williams Awarded The 2019 Microsoft Research Dissertation Grant [link]	Jul. 2019
Recognition for Efforts and Dedication in Promoting and Aiding in Student Success [link]	Jan. 2015

UVI Green Ambassadors Attending Sustainable Technology Conference [link]	Nov. 2010
Young Minds Shine at UVI [link]	Mar. 2010
UVI Student Researchers Honored at National Conferences [link]	Jan. 2010

Funding

Internal (Current)

1. University of Maryland at College Park (*The Presidential Postdoctoral Fellowship Program; The PROMISE Academy Fellowship*). Awarded to Troi Williams. Duration: Apr. 2024 — Present.

External (Completed)

6. Computing Research Association. *Integrating State-Dependent Sensor Measurement Models and Risk-Aware Planning.* Awarded to Troi Williams. Total: $152,000. Duration: Sept. 2021–Apr. 2024.
5. Microsoft Research (*Dissertation Grant*). Total: $20,740. Duration: Aug. 2019–Jul. 2020.
4. The Koerner Family Foundation (*Fellowship*). Total: $10,000. Duration: Jan. 2021–Dec. 2021.
3. The Florida Education Fund (*Ph.D. Fellowship*). Provided financial support. Duration: Aug. 2017–Dec. 2021.
2. The Alfred P. Sloan Foundation (*Ph.D. Fellowship*). Provided financial support. Duration: Aug. 2015–Dec. 2021.
1. The National GEM Consortium (*Ph.D. Fellowship*). Total: $20,000. Duration: Aug. 2015–Jul. 2017.

Internal (Completed)

3. University of South Florida (*The Florida–Georgia Louis Stokes for Alliance Minority Participation Bridge to the Project NSF Ph.D. Fellowship*). Provided financial support. Duration: Aug. 2015–Dec. 2021.
2. Norfolk State University (*Computer Science Master's Research Assistantship*). Provided financial support. Duration: Jan. 2012–Dec. 2013.
1. University of the Virgin Islands (*The Emerging Caribbean Scientist Scholar, Tutor, and Researcher Scholarship*). Provided financial support. Duration: Aug. 2008–May 2011.

Publications, Patents, and Presentations

I denote the individuals that I mentored using the symbol ($^{\Theta}$).

Peer-Reviewed Journal Articles

1. Troi Williams and Yu Sun. "Leveraging Transfer Learning to Learn State-Dependent, Sensor Measurement Models for Localization." *IEEE Transactions on Robotics*, (*Under Review*).

Peer-Reviewed Conference Proceedings

5. Troi Williams, Kasra Torshizi$^{\Theta}$, and Pratap Tokekar. "Where to Localize?: A POMDP Approach." *IEEE International Conference on Robots and Systems (IROS)*, 2024 (*Under Review*).
4. Troi Williams, Po-Lun Chen$^{\Theta}$, Sparsh Bhogavilli$^{\Theta}$, Vaibhav Sanjay$^{\Theta}$, 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. [link]
3. Harnaik Dhami$^{\Theta}$, Kevin Yu, Troi Williams, Vineeth Vajipey$^{\Theta}$, and Pratap Tokekar. "GATSBI: An Online GTSP-Based Algorithm for Targeted Surface Bridge Inspection." *International Conference on Unmanned Aircraft Systems (ICUAS)*, 2023. [link]
2. Troi Williams and Yu Sun. "Learning State-Dependent Sensor Measurement Models with Limited Sensor Measurements." *IEEE International Conference on Robots and Systems (IROS)*, 2021. [link]

1. Troi Williams and Yu Sun. "Learning State-Dependent Sensor Measurement Models for Localization." *IEEE International Conference on Robots and Systems (IROS)*, 2019. [link]

Peer-Reviewed Workshops

1. Troi Williams and Yu Sun. "Learning State-Dependent Measurement Likelihood Models with Limited Sensor Data." *Robotics: Science and Systems (RSS) Pioneers workshop*, Jul. 2021.

Lightly Peer-Reviewed Presentations and Posters

13. Troi Williams and Pratap Tokekar. "When to Localize?: A POMDP Approach." *International Symposium on Multi-Robot & Multi-Agent Systems (MRS)*. Boston, MA USA, Dec. 2023. (**Won Best Poster Award**)

12. Troi Williams and Pratap Tokekar. "Dynamically Finding Optimal States to Minimize Localization Error with State-Dependent Noise." *Northeast Robotics Colloquium (NERC)*. Lowell, MA USA, Oct. 2022. (Published in 4)

11. Troi Williams and Pratap Tokekar. "Dynamically Finding Optimal States to Minimize Localization Error with State-Dependent Noise." *The University of Maryland's Postdoctoral Research Poster Symposium Competition*. College Park, MD USA, Sept. 2022. (**Won Best Poster Award**) (Published in 4)

10. Troi Williams and Yu Sun. "Learning State-Dependent, Sensor Measurement Models for Localization." *The 2020 CRA-WP's Graduate Cohort Workshop for URMD*. Austin, TX USA, Mar. 2020. (Published in 1)

9. Troi Williams. "Learning State-Dependent, Sensor Measurement Models for Localization." *The 2019 Microsoft Research Ph.D. Summit*. Seattle, WA USA, Oct. 2019. (Published in 1)

8. Troi Williams and Yu Sun. "Learning State-Dependent, Sensor Measurement Models for Localization." *The Robotics Symposium at the Georgia Institute of Technology*. Atlanta, GA USA, Oct. 2019. (Published in 1)

7. Troi Williams and Yu Sun. "Training an Unmanned Aerial System to Predict the Probability of Collisions." *The University of South Florida's 9th Annual Engineering Research Day*. Tampa, FL USA, Nov. 2016.

6. Troi Williams and Yu Sun. "Using Neural Networks for Autonomous Obstacle Avoidance in Outdoor Environments." *The National GEM Consortium's 2016 Technical Presentation Competition and Poster Session*. Miami, FL USA, Aug. 2016.

5. Troi Williams and Yu Sun. "Detecting Zika-Vector Habitats with Autonomous Unmanned Aerial Systems." *The U.S. Agency for International Development's Unmanned Aerial Vehicle Co-Creation Session for Combating Zika*. Washington, DC USA, Jul. 2016.

4. Troi Williams, Thorna Humphries, and David Touretzky. "Using Kodu to Program Autonomous Robots." *The 27th International Conference of the Florida Artificial Intelligence Research Society (FLAIRS-27)*. Pensacola, FL USA, May 2014. (*See* 1)

3. Troi Williams, Thorna Humphries, and David Touretzky. "Using Kodu to Program Autonomous Robots." *The Carnegie Mellon University's Robotics Institute Summer Symposium*. Pittsburgh, PA USA, Aug. 2013.

2. Troi Williams and Marc Boumedine. "Using Tabu Search to Solve the Airport Gate Assignment Problem." *Emerging Researcher's National Conference*. Washington, DC USA, Feb. 2011.

1. Troi Williams and Marc Boumedine. "Using Tabu Search to Solve the Airport Gate Assignment Problem." *The 2009 Historically Black Colleges and Universities - Undergraduate Program National Conference*. Washington, DC USA, Oct. 2009. (**Best Computer Science Poster**)

Theses & Dissertations

2. Troi Williams, *Learning State-Dependent Sensor Measurement Models to Improve Robot Localization Accuracy*. Ph.D. Dissertation, University of South Florida, 2021 [link].

1. Troi Williams, *Programming Idealized Robots in the Harsh Real World*. M.S. Thesis, Norfolk State University, 2014 [link].

Patents

1. Yu Sun and Troi Williams. "Learning State-Dependent Sensor Measurement Models for Localization." Patent No. 10,572,802. Awarded Feb. 2020.

White Papers and Unpublished Papers

2. Troi Williams. "A Qualitative Analysis of the CollECT, DELTA, and DRAGON Wireless Sensor Network Protocols." Cisco Systems, Inc., Aug. 2015.

1. David Touretzky, Troi Williams, and Thorna Humphries. "Rule-Based Programming and the Future of Robotic Toys." The Robotics Institute, Carnegie Mellon University, 2015. [link] (**Used in course 15-494/694 Cognitive Robotics at Carnegie Mellon University**, see [link])

Invited Activities

Talks

1. "Dynamically Finding Optimal States to Minimize Localization Error with State-Dependent Noise." *The Maryland Robotics Center Student Seminar*, College Park, Maryland USA. Sept. 30, 2022. [link]

2. "Dynamically Finding Optimal States to Minimize Localization Error with State-Dependent Noise." *The Maryland Robotics Center Research Symposium*, College Park, Maryland USA. May 31, 2022. [link]

3. "The Journey to Ph.D. by way of Robotics and the Importance of Internships." *The Florida Agricultural and Mechanical University's Frontiers of STEAM: Thought Leaders' Discussion Series*, (Virtual). Feb. 9, 2022. (**Broadening Participation**)

4. "Detecting Zika-Vector Habitats with Autonomous Unmanned Aerial Systems." *The U.S. Agency for International Development's Unmanned Aerial Vehicle Co-Creation Session for Combating Zika*, Washington, D.C. USA. Jul. 20, 2016. (*Unpublished Work*)

Broadening Participation

Prolonged Activities

The symbol (^Λ) denotes that the activity focused on individuals from underserved communities.

1. ^Λ**Doctoral Mentoring Program**, Feb. 2024 — May 2024.
   The UMD Graduate School, University of Maryland at College Park.

2. **Resource and Event Coordinator**, Aug. 2020 — May 2021.
   The FLIT-Path Program, University of South Florida (Virtual).

3. ^Λ**Student Mentor**, May 2019 — Aug. 2019.
   USF PURE Summer Program, University of South Florida.

4. ^Λ**Student Mentor**, May 2014 — Jul. 2014.
   Math Behind the Science (MBS) Program, University of the Virgin Islands.

5. ^Λ**Middle School Mentor**, May 2014 — Jul. 2014.
   Cyber Camp, University of the Virgin Islands.

6. ^Λ**Professional Tutor**, Feb. 2014 — May 2015.
   Center for Student Success, University of the Virgin Islands.

7. ^Λ**Undergraduate Student Mentor**, Aug. 2012 — Feb. 2014.
   Department of Computer Science, Norfolk State University.

8. ^Λ**Outreach Volunteer**, Feb. 2012 — Dec. 2013.
   STARS Outreach Program, Norfolk State University.

9. ^Λ**Student Mentor**, Jun. 2011 — Aug. 2011.
   Junior University Program, University of the Virgin Islands.

Single-Day Activities

The symbol ($^{\Lambda}$) denotes that I worked with or mentored individuals from underserved communities during the event.

1. $^{\Lambda}$**Panelist**, Feb. 2021.
   Meet & Greet–Celebration of Computer Science and Engineering Graduates, University of South Florida (Virtual).
2. $^{\Lambda}$**Panelist**, Feb. 2020.
   Black to Our Roots, University of South Florida.
3. $^{\Lambda}$**Coach**, Feb. 2015.
   1st Hackfest, University of the Virgin Islands.
4. $^{\Lambda}$**Norfolk State University Team Leader**, Feb. 2014.
   ARTSI Robotics Competition, Tapia Conference (Seattle, USA).
5. $^{\Lambda}$**Volunteer**, Jul. 2013.
   Riverquest Airboats Demonstration, Carnegie Mellon University (Pittsburgh, USA).
6. $^{\Lambda}$**Instructor**, Apr. 2013.
   Lego Mindstorms NXT Training, Norfolk State University.
7. $^{\Lambda}$**Norfolk State University Team Leader**, Mar. 2013.
   ARTSI Robotics Competition, Morgan State University.
8. $^{\Lambda}$**Robotics Demonstrator**, Mar. 2013.
   William H. Ruffner Academy Career Day (Norfolk, USA).
9. **Judge**, Feb. 2013.
   Virginia First's First Tech Challenge Competition, Norfolk State University.
10. **Instructor**, Nov. 2012.
    Information Assurance Club Steganography Demonstration, Norfolk State University.
11. $^{\Lambda}$**Volunteer**, Sept. 2012.
    Girls Scouts Day, Norfolk State University.
12. $^{\Lambda}$**Volunteer**, Nov. 2011.
    Family Space Day, The Lunar and Planetary Institute (Houston, USA).
13. **Volunteer**, Oct. 2011.
    Project Morpheus Showcase at the Houston Airshow, Johnson Space Center (Houston USA).

Individual Mentoring

I grouped the individuals into categories based on when I began mentoring/advising them. The symbol ($^{\Lambda}$) denotes individuals from underserved communities in Computer Science and Engineering.

- Undergraduate Students: Jean-Luc Hayes$^{\Lambda}$, Gregory Hinkson$^{\Lambda}$, Christopher Okonkwo$^{\Lambda}$, Eliakin del Rosario$^{\Lambda}$, Vaibhav Sanjay, Vineeth Vaipey.
- Graduate Students: Hailey Baez$^{\Lambda}$, Sparsh Bhogavilli, Po-Lun Chen, Harnaik Dhami, Mayank Sharma, Chak Lam Shek, Kasra Torshizi.

Collaborations

The following list specifies the individuals that I am working with or have worked with and their corresponding institutions at the time of the collaboration.

- University of Maryland: Sparsh Bhogavilli, Harnaik Dhami, Po-Lun Chen, Vaibhav Sanjay, Mayank Sharma, Chak Lam Shek, Pratap Tokekar, Kasra Torshizi, Vineeth Vajipey.
- University of South Florida: Yu Sun.
- Norfolk State University: Thorna Humphries.

- Carnegie Mellon University: David Touretzky.
- University of the Virgin Islands: Marc Boumedine.

Service

Department

ABET Material Collector, Aug. 2020 — Dec. 2020.
Department of Computer Science and Engineering, University of South Florida.

ABET Material Collector, Oct. 2017.
Department of Computer Science and Engineering, University of South Florida.

College/School

Seminar Host, May 2022.
Lockheed Martin Robotics Seminar Presentation: "Data-driven design of soft robotic sensors", University of Maryland.

USF College of Engineering Representative, Nov. 2017.
The 2017 Florida Automated Vehicle Summit (Tampa Bay, USA).

USF Graduate School Recruiter, Mar. 2017.
The National Society of Black Engineers' 43rd Annual Convention (Kansas City, USA).

Judge, Sept. 2014.
The 2014 Fall Research Symposium, University of the Virgin Islands.

University

Planning Committee, Jul. 2022 — Sept. 2022.
Postdoctoral Symposium, University of Maryland at College Park.

Panel Moderator and Judge, Apr. 2016.
The 2016 Undergraduate Research and Arts Colloquium, University of South Florida.

Organization and Profession

Program Committee, Nov. 2022 — Jun. 2023.
Pioneers Workshop, The Robotics: Science and Systems Conference.

Session Chair, Sept. 2021.
Range Sensing Session, The IEEE International Conference on Intelligent Robots and Systems.

Panelist, Feb. 2020.
Computer Science Session, The F.E.F. McKnight Mid-Year Research and Writing Conference.

Chair, Feb. 2017, Feb. 2016.
Computer Science Session, The F.E.F. McKnight Mid-Year Research and Writing Conference.

Review of Manuscripts

- ICRA - 2024, 2023, 2021
- IROS - 2024, 2022, 2020, 2019

Professional Affiliations

Black in Robotics	Sept. 2020 — Present
Institute of Electrical and Electronics Engineers (IEEE)	Jun. 2019 — Present
IEEE Robotics and Automation Society (RAS)	Jun. 2019 — Present
IEEE Computer Society	Jun. 2019 — Dec. 2021
Black in Artificial Intelligence (A.I.)	Mar. 2018 — Present
National Society of Black Engineers	Mar. 2017 — Mar. 2018

Advisor, UVI Computer Science and Engineering Club	Aug. 2014 — May 2015
Intel Artificial Intelligence Student Ambassador Program	Dec. 2016 — Dec. 2021
Association for Computing Machinery (ACM)	Sept. 2013 — Jun. 2019
Association for the Advancement of Artificial Intelligence (AAAI)	Sept. 2013 — Aug. 2015
Secretary, NSU Information Assurance Club	Apr. 2012 — Dec. 2013
Golden Key National Honor Society, UVI-St. Thomas Chapter	Jan. 2010 — Present
Public Relations Officer, UVI Green Ambassadors	Jan. 2010 — Jan. 2011

Certification and Knowledge

- Private Pilot License (since 2011): Airplane single-engine land, Airplane multi-engine land, Instrument-rated.
- Natural Languages (proficiency listed according to the ILR scale): English (native), German (elementary proficiency), Spanish (elementary proficiency).