# David Porfirio

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Google Scholar

## Research Interests

My research focuses on human-robot interaction, specifically **human-robot task communication**. To this end, I design and evaluate novel technologies that empower users to create personalized robot applications.

## Education

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| PhD | University of Wisconsin–Madison (UW–Madison), Madison, WI, USA<br>Computer Sciences | 2018-2022 |
| MSc | UW–Madison, Madison, WI, USA<br>Computer Sciences | 2016-2018 |
| BS | University of Arizona (UA), Tucson, AZ, USA<br>Double degree (hon) in computer science and physiology<br>Minor in mathematics<br>Summa cum laude | 2011-2016 |

## Work & Research Experience

**Computer Scientist** 2024-Present
Adaptive Systems Section
Navy Center for Applied Research in Artificial Intelligence
United States Naval Research Laboratory

**NRC RAP Postdoctoral Fellow** 2022-2024
Adaptive Systems Section
Navy Center for Applied Research in Artificial Intelligence
United States Naval Research Laboratory
Advisor: Dr. Laura Hiatt

**Doctoral Research** 2016-2022
People and Robots Laboratory
UW–Madison Computer Sciences Department
Advisors: Drs. Bilge Mutlu & Aws Albarghouthi
Committee: Drs. Bilge Mutlu, Aws Albarghouthi, Maya Cakmak, & Kevin Ponto

**Research Intern** Summer 2021
Nokia Bell Labs, New Providence, NJ, USA (Virtual)
Mentors: Drs. Martin Carroll, Kedar Namjoshi, Itai Segall

**Undergraduate Senior Thesis** 2015-2016
UA Department of Computer Science
Advisor: Dr. John Kececioglu

**Undergraduate Research** 2013-2014
UA Department of Computer Science
Advisors: Drs. E. Fiona Bailey and Joanna Masel

## Refereed Full Papers

Stegner, L., Hwang, Y., **Porfirio, D.**, & Mutlu, B. (2024, July). Understanding On-the-Fly End-User Robot Programming. In Proceedings of the 2024 ACM Designing Interactive Systems Conference (pp. 2468-2480). — Acceptance rate: 25%

**Porfirio, D.**, Roberts, M., & Hiatt, L. (2024, March). Goal-Oriented End-User Programming of Robots. In Proceedings of the 2024 ACM/IEEE International Conference on Human-Robot Interaction (pp. 582-591). — Acceptance rate: 25%

**Porfirio, D.**, Roberts, M., & Hiatt, L. (2023, August). Guidelines for a Human-Robot Interaction Specification Language. In 2023 IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN) IEEE.

**Porfirio, D.**, Stegner, L., Cakmak, M., Sauppé, A., Albarghouthi, A., & Mutlu, B. (2023, March). Sketching Robot Programs On the Fly. In 2023 18th ACM/IEEE International Conference on Human-Robot Interaction (HRI). ACM/IEEE. — Acceptance rate: 25%

**Porfirio, D.**, Stegner, L., Cakmak, M., Sauppé, A., Albarghouthi, A., & Mutlu, B. (2021, May). Figaro: A Tabletop Authoring Environment for Human-Robot Interaction. In Proceedings of the 2021 Conference on Human Factors in Computing Systems (CHI) (pp. 1-15). — Acceptance rate: 26%

**Porfirio, D.**, Sauppé, A., Albarghouthi, A., & Mutlu, B. (2020, April). Transforming robot programs based on social context. In Proceedings of the 2020 conference on human factors in computing systems (CHI) (pp. 1-12). — Acceptance rate: 24%

**Porfirio, D.**, Fisher, E., Sauppé, A., Albarghouthi, A., & Mutlu, B. (2019, October). Bodystorming human-robot interactions. In Proceedings of the 32nd Annual ACM Symposium on User Interface Software and Technology (UIST) (pp. 479-491). ACM. — Acceptance rate: 24%

**Porfirio, D.**, Sauppé, A., Albarghouthi, A., & Mutlu, B. (2018, October). Authoring and verifying human-robot interactions. In The 31st Annual ACM Symposium on User Interface Software and Technology (UIST) (pp. 75-86). ACM. **Best Paper Award** — Acceptance rate: 21%

Xiong, K., McEntee, J. P., **Porfirio, D. J.**, & Masel, J. (2017). Drift barriers to quality control when genes are expressed at different levels. Genetics, 205(1), 397-407. — Impact factor: 3.564

Shumway, K. R., **Porfirio, D. J.**, & Bailey, E. F. (2015). Phonation-related rate coding and recruitment in the genioglossus muscle. Experimental brain research, 233(7), 2133-2140. — Impact factor: 2.395

## Refereed Short Papers

**Porfirio, D.**, Roberts, M., & Hiatt, L. M. (2025, March). An Interaction Specification Language for Robot Application Development. In 2025 ACM/IEEE International Conference on Human-Robot Interaction (HRI) (in press). — Acceptance rate: 54.5%

Praveena, P., Schoen, A., Gleicher, M., **Porfirio, D.**, & Mutlu, B. (2023, October). Petri Nets for the Iterative Development of Interactive Robotic Systems. In 2023 AAAI Fall Symposium Series on *Unifying Representations for Robot Application Development* (UR-RAD).

Stegner, L., **Porfirio, D.**, Roberts, M., & Hiatt, L. (2023, October). Considerations for End-User Development in the Caregiving Domain. In 2023 AAAI Fall Symposium Series on *Unifying Representations for Robot Application Development* (UR-RAD).

**Porfirio, D.**, Roberts, M., & Hiatt, L. (2023, March). On a Standardized Logical Representation for Human-Robot Interaction. In 2023 AAAI Spring Symposium, *HRI in Academia and Industry: Bridging the Gap*

**Porfirio, D.**, Sauppé, A., Cakmak, M., Albarghouthi, A., & Mutlu, B. (2023, March). Crowdsourcing Task Traces for Service Robotics. In 2023 18th ACM/IEEE International Conference on Human-Robot Interaction (HRI).

**Porfirio, D.**, Cakmak, M., Sauppé, A., Albarghouthi, A., & Mutlu, B. (2021, May). Interaction Templates: A Data-Driven Approach for Authoring Robot Programs. In 2021 12th Annual Workshop on Evaluation and Usability of Programming Languages and Tools (PLATEAU).

**Porfirio, D.**, Sauppé, A., Albarghouthi, A., & Mutlu, B. (2019, March). Computational Tools for Human-Robot Interaction Design. In 2019 14th ACM/IEEE International Conference on Human-Robot Interaction (HRI) (pp. 733-735). IEEE. Acceptance rate: 31%

## Fellowships, Honors, and Awards

**Jerome and Isabella Karles Fellowship** 2024-2025
U.S. Naval Research Laboratory

**Best Paper Nominee** 2023
2023 AAAI Spring Symposium, *HRI in Academia and Industry: Bridging the Gap*

**Postdoctoral Research Award** 2022-Present
NRC Research Associateship Programs

**Robotics Perception and Learning Summer School, KTH Royal Institute of Technology** 2021
Invited to attend

**Microsoft Dissertation Grant** 2021
Awarded $21,148 for dissertation research

**Cisco Graduate Student Fellowship** 2021
Selected by the UW–Madison Computer Sciences Department

**Heidelberg Laureate Forum** 2019
Invited to attend as a young researcher

**Best Paper Award** 2018
UIST '18

**NSF Graduate Research Fellowship** 2017-2022

**Advanced Opportunity Fellowship** 2016, 2020
Selected by the UW–Madison Computer Sciences Department

**Excellence in Undergraduate Research Award** 2016
Selected by the UA Department of Computer Science

**Galileo Circle Scholar** 2015
Selected by the UA Department of Computer Science

**National Hispanic Scholar** 2011
Selected by the National Hispanic Recognition Program

**Dean's List with Distinction** 2011-2016
Awarded during six semesters at UA

## Teaching Experience

**Guest Lecturer** Fall 2024
CMSC 722, *AI Planning*, University of Maryland, College Park

**Grandparents University Instructor** Summers 2018-2019
Co-organized social robotics lecture and lab sessions for children and their grandparents.

**Teaching Assistant, UA** Summer 2015
CSC 352, *Systems Programming and Unix*
Duties: holding office hours and grading programming assignments

**Section Leader, UA** Fall 2014 - Spring 2015
CSC 245, *Introduction to Discrete Structures*
CSC 227, *Program Design and Development*
Duties: teaching lab sessions, holding office hours, and grading assignments

## Academic Services

**Event Organization**
2025 Program committee (PC) member for the ACM/IEEE International Conference on Human-Robot Interaction (HRI)
2024 AAAI Fall Symposium Series—*Unifying Representations for Robot Application Development*
2024 Program committee (PC) member for HRI
2024 HRI Workshop—*End-User Development for Human-Robot Interaction*
2023 AAAI FSS—*Unifying Representations for Robot Application Development*
2022 HRI Workshop—*Participatory Design and End-User Programming for Human-Robot Interaction*

**Referee Service**
HRI (incl. alt.HRI)—*2020*, *2022*, *2023*
HRI (LBR & Pioneers)—*2021*, *2023*, *2024*, *2025*
CHI—*2022*, *2024*, *2025*
THRI—*2020*, *2024*
Int. J. Soc. Robot.—*2022*, *2024*
AAMAS—*2024*, *2025*
CogSci—*2024*
ICRA—*2024*, *2025*
UIST—*2021*
AAAI FSS, AI-HRI—*2022*
TAHRI—*2024*
CSCW—*2022*
HAI—*2023*

**Ph.D. Committee Member for the Following Students**
Saad Elbeleidy (2024)—*Colorado School of Mines*

## Technical Skills

**Programming Languages**
Python, Golang, Java, Javascript, HTML, CSS, C#, C, PDDL, GDScript

**Game Engines**
Unity Editor, Godot

**Tools, Libraries, and Frameworks**
ROS (1 and 2), Unified Planning, Z3 Theorem Prover, PRISM Model Checker, NuSMV Model Checker, LaTeX, Git, OpenCV, D3.js, Matplotlib

**Robot Platforms**
Hello-Robot Stretch 2, Softbank Pepper, Softbank Nao, Temi, iRobot Create 2

**Design**
Illustrator, Premiere, Photoshop, Affinity Designer