David Porfirio

NRC Postdoctoral Research Associate
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RESEARCH INTERESTS

My research lies at the intersection of **robot application development** and **human-robot interaction**. To this end, I design and evaluate novel technologies that empower users to create personalized robot applications.

EDUCATION

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

WORK & RESEARCH EXPERIENCE

NRC RAP Postdoctoral Fellow — 2022-Present
United States Naval Research Laboratory
Advisor: Dr. Laura Hiatt

Doctoral Research — 2016-2022
UW–Madison Computer Sciences Department
Committee: Drs. Bilge Mutlu, Aws Albarghouthi, Maya Cakmak, and 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

Porfirio, D., Roberts, M., & Hiatt, L. (2024, March). Goal-Oriented End-User Development of Robots. In 2024 18th ACM/IEEE International Conference on Human-Robot Interaction (HRI). (in press) ACM/IEEE. — 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

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) (in press).

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) (in press).

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) (in press). ACM/IEEE.

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) (in press).

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

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

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

Referee Service

2024 ACM International Conference on Autonomous Agents and Multiagent Systems (AAMAS)
2024 IEEE International Conference on Robotics and Automation (ICRA)
2024 ACM Conference on Human Factors in Computing Systems Full Papers (CHI)
2024 ACM/IEEE HRI PIONEERS Workshop
2023 ACM International Conference on Human-Agent Interaction (HAI) Full Papers
2023 ACM/IEEE HRI Full Papers
2023 ACM/IEEE HRI Late-Breaking Reports (LBR)
2023 ACM/IEEE HRI PIONEERS Workshop
2022 ACM Conference On Computer-Supported Cooperative Work And Social Computing (CSCW)
2022 ACM/IEEE HRI Full Papers
2022 ACM CHI Full Papers (CHI)
2021 ACM Symposium on User Interface Software and Technology (UIST)
2021 AAAI Artificial Intelligence for Human-Robot Interaction (AI-HRI) Fall Symposium Series
2021 ACM/IEEE HRI LBR
2021 ACM/IEEE HRI PIONEERS Workshop
2020 ACM Transactions on Human-Robot Interaction (THRI)
2020 ACM/IEEE HRI Alt.HRI

TECHNICAL SKILLS

Programming
Python, Golang, Java, Javascript, HTML, CSS, C#, C

Tools, Libraries, and Frameworks
ROS, Z3 Theorem Prover, PRISM Model Checker, NuSMV Model Checker, LaTeX, Git, OpenCV, D3.js, Matplotlib
fast-downward/PDDL

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

Software
Illustrator, Premiere, Photoshop, Unity Editor, Office