David Porfirio

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Google Scholar

Research Interests

My goal is to make **programming socially interactive robots** easy and approachable for both professional and end-user human-robot interaction developers. To achieve my goal, I design a diverse set of **user interfaces for capturing developer intent**. Within these interfaces, some development techniques I use include **formal verification** to help developers incorporate robot social norms into their interaction programs, **program synthesis** to assist developers prototype interaction programs from scratch, and **program repair** to automatically fix inadequate interaction programs.

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., 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., 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

Postdoctoral Research Award — 2022-Present
NRC Research Associateship Programs

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

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

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

Referee Service
2022 ACM Conference On Computer-Supported Cooperative Work And Social Computing
2022 ACM/IEEE International Conference on Human-Robot Interaction (HRI)
2022 ACM Conference on Human Factors in Computing Systems (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 International Conference on Human-Robot Interaction Late Breaking Reports
2021 ACM/IEEE International Conference on Human-Robot Interaction PIONEERS Workshop
2020 ACM Transactions on Human-Robot Interaction (THRI)
2020 ACM/IEEE International Conference on Human-Robot Interaction Alt.HRI

Event Organization
2022 HRI Workshop—*Participatory Design and End-User Programming for Human-Robot Interaction*

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

Robot Platforms
Softbank Pepper, Softbank Nao, Temi, iRobot Create 2

Software
Illustrator, Premiere, Photoshop, Unity, Office