NICK WALKER

Ph.D. Candidate in Computer Science

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INTERESTS

I am an expert in developing, formalizing and evaluating new interactions. My Ph.D. focuses on human-robot communication, with topics including service robots, teleoperation, and natural language interfaces. I expect to graduate March 2025.

EDUCATION

Ph.D. Computer Science *University of Washington, Seattle, WA* 2018—

- Advised by Maya Cakmak, GPA: 3.84/4.00
- Thesis: Making Robot Behaviors Automatically Transparent

M.S. Computer Science *University of Washington, Seattle, WA* 2018–20

B.S.A. Computer Science *The University of Texas, Austin, TX* 2014–18

- Research advisors Peter Stone, Matteo Leonetti, Jivko Sinapov, Justin Hart, GPA: 3.94/4.00
- Polymathic Scholar (Interdisciplinary Honors)

PUBLICATIONS

Conference

[c12] **"I Can Tell What I Am Doing: Toward Real-World Natural Language Grounding of Robot Experiences."** Z. Wang, B. Liang, V. Dhat, Z. Brumbaugh, N. Walker, R. Krishna, M. Cakmak. *Conf. Robot Learning*. Munich, Germany, Nov. 2024

[c11] **"Fast Explicit-Input Assistance for Teleoperation in Clutter."** N. Walker, X. Yang, A. Garg, M. Cakmak, D. Fox, C. Pérez-D'Arpino. *2024 IEEE/RSJ Int. Conf. Intelligent Robots Systems*. Abu Dhabi, UAE, Oct. 2024

[c10] **"Using 3D Mice to Control Robot Manipulators."** V. Dhat, N. Walker, M. Cakmak. *ACM/IEEE Int. Conf. Human-Robot Interaction*. Boulder, CO, USA, Mar. 2024

[c9] **"Not All Who Wander Are Lost: A Localization-Free System for In-the-Wild Mobile Robot Deployments."** A. Nanavati*, N. Walker*, L. Taber, C. Mavrogiannis, L. Takayama, M. Cakmak, S. Srinivasa. *Proc. 2022 ACM/IEEE Int. Conf. Human-Robot Interaction*. Sapporo, Hokkaido, Japan, Mar. 2022

[c8] **"Influencing Behavioral Attributions to Robot Motion During Task Execution."** N. Walker, C. Mavrogiannis, S. Srinivasa, M. Cakmak. *Conf. Robot Learning*. London, UK, Nov. 2021

[c7] **"Learning Backchanneling Behaviors for a Social Robot via Data Augmentation from Human-Human Conversations."** M. Murray, N. Walker, A. Nanavati, P. Alves-Oliveira, N. Filippov, A. Sauppe, B. Mutlu, M. Cakmak. *Conf. Robot Learning*. London, UK, Nov. 2021

[c6] **"Human Perceptions of a Curious Robot that Performs Off-Task Actions."** N. Walker, K. Weatherwax, J. Alchin, L. Takayama, M. Cakmak. *Proc. 2020 ACM/IEEE Int. Conf. Human-Robot Interaction*. Oxford, UK, Mar. 2020

[c5] **"Open-World Reasoning for Service Robots."** Y. Jiang*, N. Walker*, J. Hart, P. Stone. *Proc. 29th Int. Conf. Automated Planning Scheduling*. Berkeley, Jul. 2019

[c4] **"Improving Grounded Natural Language Understanding through Human-Robot Dialog."** J. Thomason, A. Padmakumar, J. Sinapov, N. Walker, Y. Jiang, H. Yedidsion, J. Hart, P. Stone, R. J. Mooney. *Int. Conf. Robotics Automation*. Montreal, May 2019

[c3] "PRISM: Pose Registration for Integrated Semantic Mapping." J. W. Hart, R. Shah, S. Kirmani, N. Walker, K. Baldauf, N. John, P. Stone. *2018 IEEE/RSJ Int. Conf. Intelligent Robots Systems*. Madrid, Spain, Oct. 2018

[c2] "Automatic Curriculum Graph Generation for Reinforcement Learning Agents." M. Svetlik, M. Leonetti, J. Sinapov, R. Shah, N. Walker, P. Stone. *Proc. Thirty-First AAAI Conf. Artificial Intelligence*. San Francisco, Feb. 2017

[c1] "Wearable ear EEG for brain interfacing." E. D. Schroeder, N. Walker, A. S. Danko. *Proc. of SPIE 10051, Neural Imaging Sensing*. San Francisco, Feb. 2017

Preprint

[p1] "An Architecture for Person-Following using Active Target Search." M. Kim, M. Arduengo, N. Walker, Y. Jiang, J. W. Hart, P. Stone, L. Sentis. *arXiv*:1809.08793, Sept. 2019

Journal

[j1] "Jointly Improving Parsing and Perception for Natural Language Commands through Human-Robot Dialog." J. Thomason, A. Padmakumar, J. Sinapov, N. Walker, Y. Jiang, H. Yedidsion, J. Hart, P. Stone, R. J. Mooney. *Journal of Artificial Intelligence Research*. Feb. 2020

Refereed Symposium, Workshop

[w7] "Can Large Language Models Help Developers with Robotic Finite State Machine Modification?." X. Gan*, Y. R. Song*, N. Walker, M. Cakmak. *LangRob Workshop at Conf. Robot Learning*. Munich, Germany, Nov. 2024

[w6] "Towards robustly picking unseen objects from densely packed shelves." M. Grotz, J. Lowry, S. Atar, Y. Li, P. Torrado, B. Yang, N. Walker, M. Murray, D. Fox, M. Cakmak, J. R. Smith. *Proc. RSS Workshop Perception Manipulation Challenges for Warehouse Automation*. Daegu, Republic of Korea, Jul. 2023

[w5] "Influencing Behavioral Attributions to Robot Motion During Task Execution." N. Walker, C. Mavrogiannis, S. Srinivasa, M. Cakmak. *Proc. 2021 ICRA Workshop Modern Approaches for Intrinsically-Motivated Intelligent Behavior*. Xi'an, China, Jun. 2021

[w4] "Desiderata for Planning Systems in General-Purpose Service Robots." N. Walker*, Y. Jiang*, M. Cakmak, P. Stone. *Proc. of 2019 ICAPS Workshop Planning Robotics*. Berkeley, Jul. 2019

[w3] "Neural Semantic Parsing with Anonymization for Command Understanding in General-Purpose Service Robots." N. Walker, Y.-T. Peng, M. Cakmak. *RoboCup 2019: Robot Soccer World Cup XXIII*. Sydney, Jul. 2019

[w2] "LAAIR: A Layered Architecture for Autonomous Interactive Robots." Y. Jiang*, N. Walker*, M. Kim, N. Brissonneau, D. S. Brown, J. W. Hart, S. Niekum, L. Sentis, P. Stone. *AAAI Fall Symp. Reasoning Learning in Real-World Systems for Long-Term Autonomy*. Arlington, Oct. 2018

[w1] "Interaction and Autonomy in RoboCup@Home and Building-Wide Intelligence." J. Hart, H. Yedidsion, Y. Jiang, N. Walker, R. Shah, J. Thomason, A. Padmakumar, R. Fernandez, J. Sinapov, R. Mooney, P. Stone. *AAAI Fall Symp. Artificial Intelligence Human-Robot Interaction*. Arlington, Oct. 2018

Periodical Feature

[f2] "A Guide to Transit-Oriented Running in Seattle." N. Walker. *The Urbanist*, Nov. 2023

[f1] "Wandering Robots in the Wild." N. Walker, A. Nanavati. *IEEE Spectrum*, Jul. 2022

RECOGNITION

Best Short Paper – *ACM/IEEE International Conference on Human-Robot Interaction* 2024
Graduate Research Fellowship – *National Science Foundation* 2020—
Computer Science & Engineering Research Fellowship – *Allen School, UW* 2018–19
Best Poster, with UT Austin Villa – *RoboCup@Home DSPL* 2018
Commencement Student Speaker – *College of Natural Sciences, UT* 2018
GRFP Honorable Mention – *National Science Foundation* 2018
Dean's Honored Graduate – *College of Natural Sciences, UT* 2018
Outstanding Undergraduate Researcher Award Honorable Mention – *Computing Research Association* 2018
TIDES Fellowship – *Texas Institute for Discovery Education in Science, UT* 2017
College of Natural Sciences Scholarship – *College of Natural Sciences, UT* 2014–18

RESEARCH EXPERIENCE

Graduate Research Assistant *University of Washington* 2018—
- Making robot behaviors automatically transparent
- Generating communicative actions during task execution
- Perceptions of intrinsically motivated robot behaviors

Research Intern *NVIDIA* 2022 Su.
- Designed and evaluated teleoperation assistance for manipulation in clutter

Research Engineer Intern *USAA* 2016 Su.
- Ear-worn brain-computer interface software and hardware for biometric authentication

Peer Mentor *University of Texas* 2016–18
- Long-term autonomy for service robots
- Mobile manipulation in homes and offices
- Grounded natural language understanding
- Automated curriculum learning for reinforcement learning agents

Research Engineer Intern *USAA* 2015 Su.
- Evaluation of automated speech transcription vendors

LEADERSHIP AND PROFESSIONAL SERVICE

Organizer – *Drumheller Marathon & Half Marathon* 2022—
Organizer – *Light Rail Relay* 2021—
Organizer – *Northwest Robotics Symposium* 2022
NSF GRFP Seminar Coordinator – *Allen School Graduate Student Committee, UW* 2020
Organizer – *Practical Service Robots Workshop, RSS* 2020
Organizer – *Imitation Learning Workshop, RSS* 2020
Technical Committee – *RoboCup@Home* 2019–20
Peer Mentor – *Allen School First Year Graduate Student Mentoring, UW* 2019–21
Reader – *Allen School Ph.D. Admissions Committee, UW* 2018

Reviewing

CHI	'25	IROS	'24, '21	TAFFC	'22, '21	Sci. Rob.	'21
HRI	'25, '24, '23, '22	T-RO	'24	RA-L	'21	TCDS	'20
CoRL	'24, '23, '22	THRI	'24, '23, '20	RSS	'21		
ICRA	'24, '23, '21, '19	IJSR	'23, '22	SSRR	'21		

TEACHING EXPERIENCE

Teaching Assistant *UW CSE 478 (Robotics)* 2021 Sp.

- Ported autonomous race-car assignments to Python 3, developed CI autograder, supported students

Teaching Assistant *UW CSE 481C (Robotics Capstone)* 2019 Wi.

- Developed assignments, supported undergraduates using the Kuri robot

SKILLS

Languages – *Python, C++, Javascript, Typescript, HTML, CSS, Answer Set Programming*
Frameworks & Tools – *PyTorch, Numpy, Scipy, OpenCV, Pandas, ROS 1 & 2, Docker, Isaac Sim, D3.js, three.js, p5.js*
User research – *Mixed methods, Study design, Hypothesis testing*
Digital media – *Premiere, Photoshop, Illustrator, InDesign, Lightroom*

PERSONAL

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