

Wil Thomason

CONTACT INFORMATION	Rice University Department of Computer Science DH 3053, 6100 Main Street Houston, TX 77005	wbthomason@rice.edu https://wbthomason.github.io
CURRENT POSITION	Postdoctoral Research Fellow , Rice University, Houston, TX	Since January 2022
RESEARCH INTERESTS	Robot autonomy: integrated task and motion planning, neuro-symbolic planning, planning under uncertainty, hardware accelerated planning, motion planning, ML for planning	
AWARDS	Computing Innovation Postdoctoral Fellowship <i>Computing Research Association (CRA) and National Science Foundation (NSF).</i> 29% acceptance rate	August 2021
	RSS Pioneers <i>Robotics: Science and Systems. 33.7% acceptance rate</i>	April, 2020
	Outstanding Teaching Assistant Award <i>Cornell University Department of Computer Science</i>	May 2017
	NDSEG Fellow <i>American Society for Engineering Education</i>	April 2017
	NSF GRFP Fellow <i>The National Science Foundation</i>	March 2017
	Outstanding Teaching Assistant Award <i>Cornell University Department of Computer Science</i>	May 2016
	NSF GRFP Honorable Mention <i>The National Science Foundation</i>	March 2016
	Louis T. Rader Outstanding Education Undergraduate Student <i>University of Virginia Department of Computer Science</i>	May 2015
PEER-REVIEWED CONFERENCE PUBLICATIONS	<ol style="list-style-type: none">7. <i>Motions in Microseconds via Vectorized Sampling-Based Planning</i>. Wil Thomason*, Zachary Kingston*, and Lydia E. Kavraki. ICRA 2024, under review. * signifies equal contribution.6. <i>Stochastic Implicit Neural Signed Distance Functions for Safe Motion Planning under Sensing Uncertainty</i>. Carlos Quintero-Peña, Wil Thomason, Zachary Kingston, and Lydia E. Kavraki. ICRA 2024, under review.5. <i>Accelerating Long-Horizon Planning with Affordance-Directed Dynamic Grounding of Abstract Skills</i>. Khen Elimelech, Zachary Kingston, Wil Thomason, Moshe Y. Vardi, and Lydia E. Kavraki. ICRA 2024, under review.4. <i>Object Reconfiguration with Simulation-Derived Feasible Actions</i>. Yiyuan Lee, Wil Thomason, Zachary Kingston, and Lydia E. Kavraki. ICRA 2023.3. <i>A Unified Sampling-Based Approach to Integrated Task and Motion Planning</i>. Wil Thomason and Ross Knepper. ISRR 2019.2. <i>Social Momentum: A Framework for Legible Navigation in Dynamic Multi-Agent Environments</i>. Christoforos Mavrogiannis, Wil Thomason, Ross Knepper. HRI 2018.1. <i>Zero-Shot Learning for Unfamiliar Gesture Recognition</i>. Wil Thomason and Ross Knepper. ISER 2016.	
JOURNAL PUBLICATIONS	<ol style="list-style-type: none">4. <i>Counterexample-Guided Repair for Symbolic-Geometric Action Abstractions</i>. Wil Thomason and Hadas Kress-Gazit. T-RO 2023.3. <i>Task and Motion Informed Trees (TMIT*)</i>: Almost-Surely Asymptotically Optimal Integrated Task and Motion Planning. Wil Thomason, Marlin P. Strub, Jonathan D. Gammell. IEEE RA-L 2022, also presented at IROS 2022.	

	<ol style="list-style-type: none"> 2. <i>Social Momentum: Design and Evaluation of a Framework for Socially Competent Robot Navigation</i>. Christoforos Mavrogiannis, Patrícia Alves-Oliveira, Wil Thomason, Ross A. Knepper. T-HRI 2021. 1. <i>An Accurate Real-Time RFID-Based Location System</i>. Kirti Chawla, Christopher McFarland, Gabriel Robins, Wil Thomason. International Journal of Radio Frequency Identification Technology and Applications. July 2016, authors listed in alphabetical order.
PREPRINTS	<ol style="list-style-type: none"> 1. <i>Ensuring Progress for Multiple Mobile Robots via Space Partitioning, Motion Rules, and Adaptively Centralized Conflict Resolution</i>. Claire Liang*, Wil Thomason*, Andy Elliot Ricci, and Soham Sankaran. arXiv 2021.
WORKSHOP PRESENTATIONS	<p>“Robust, Efficient, and Flexible Robot Planning.” July 11, 2020. <i>RSS Pioneers 2020</i></p> <p>“A Flexible Sampling-Based Approach to Task and Motion Planning.” June 23, 2019. <i>RSS 2019 Workshop on Robust Task and Motion Planning</i></p> <p>“Which comes first, the task plan or the motion plan?.” June 30, 2018. <i>RSS 2018 Workshop on Exhibition and Benchmarking of Task and Motion Planners</i>. Joint with Ross A. Knepper.</p> <p>“Exploiting Heterogeneity in Robot Teams Through a Formalism of Capabilities.” July 15, 2017. <i>RSS 2018 Workshop on Heterogeneity and Diversity for Resilience in Multi-Robot Systems</i></p> <p>“Toward Contextual Grounding of Unfamiliar Gestures for Human-Robot Interaction.” May 30, 2017. <i>FG 2017: First International Workshop on Adaptive Shot Learning for Gesture Understanding and Production</i></p> <p>“Recognizing Unfamiliar Gestures for Human-Robot Interaction through Zero-Shot Learning.” June 19th, 2016. <i>2nd Workshop on Model Learning for Human-Robot Communication, RSS 2016</i></p>
INVITED TALKS AND CONSORTIA	<p>Interactive Robot Perception and Learning Lab 2023 Invited to present my work on vector-accelerated motion planning in the Interactive Robot Perception and Learning Lab.</p> <p>Search Based Planning Lab 2020 Invited to present my work on integrated task and motion planning and automatic abstraction repair in the Search Based Planning Lab.</p> <p>RSS Pioneers Workshop (<i>virtual due to COVID-19</i>) 2020 Selective annual workshop in conjunction with the Robotics: Science and Systems conference. Designed to “bring together a cohort of the world’s top early career researchers to foster creativity and collaborations surrounding challenges in all areas of robotics.” (33.7% acceptance rate)</p>
EDUCATION	<p>Cornell University, Ithaca, NY August 2015 – December 2021 <i>Ph.D. in Computer Science</i>. Advisor: Hadas Kress-Gazit.</p> <p>Cornell University, Ithaca, NY August 2015 – June 2019 <i>MS in Computer Science</i>. Advisor: Ross A. Knepper.</p> <p>University of Virginia, Charlottesville, VA August 2012 – May 2015 <i>BS (with high distinction) in Computer Science and Mathematics</i></p>
TEACHING EXPERIENCE	<p>CS 4750 (<i>Foundations of Robotics</i>) <i>Cornell University</i>, Fall 2016 & Fall 2017 Graduate TA (syllabus creation, coding project creation and implementation, grading, office hours, occasional lecturing). Senior and graduate-level elective.</p> <p>CS 1110 (<i>Introduction to Computing Using Python</i>) <i>Cornell University</i>, Fall 2015 Head graduate TA (coordinating staff, giving review lectures, supervising lab sessions, grading, office hours). Introductory undergraduate CS course.</p> <p>ENG 1501 (<i>Introduction to Aerial Robotics</i>) <i>University of Virginia</i>, Fall 2014</p>

Instructor. Designed and taught 1-credit special-topics undergraduate elective introducing core topics in robotics. Students built and programmed their own quadrotor robots and learned about basic kinematics, control, and perception.

CS 4610 (*Programming Languages*) *University of Virginia*, Spring 2015
Undergraduate TA. Senior-level elective.

CS 4710 (*Artificial Intelligence*) *University of Virginia*, Spring 2015
Undergraduate TA. Senior-level elective.

CS 4414 (*Operating Systems*) *University of Virginia*, Spring 2014
Undergraduate TA (office hours, assignment creation). Senior-level core course.

CS 2150 (*Program and Data Representation*) *University of Virginia*, (Fall 2013 – Spring 2015).
Undergraduate TA (office hours, lab supervision, grading). Sophomore-level core course.

OUTREACH
Reviewer for Black in AI: Reviewed abstracts for BAI workshop. 2017–2021
Mentor for Black in AI: Advised mentee on Ph.D. application process. 2019–2020
Expanding Your Horizons: Workshop Organizer/Leader. Spring 2016, 2017, 2018
UVa HS Programming Contest: Organizer/volunteer. Spring 2014, 2015
UVa CS Education Week Ran intro CS workshop. Winter 2014, 2015

SERVICE AND ORGANIZATIONAL WORK
Co-Organizer: [IROS 2022 Workshop on Evaluating Motion Planning Performance](#).
Faculty chair: [RSS Pioneers 2021](#) workshop.
Reviewer: IJRR, T-RO, ICRA, IROS, RSS, WAFR, MRS, RO-MAN, RA-L, IJCAI, AURO, T-ASE, and SIMPAR.
Departmental Service: Student representative to Diversity and Inclusion Committee (2020–2021), Colloquium Czar (2016–2020), Administrative Colloquium Czar (2016–2019), Ph.D. Mentor Czar (2016–2018).

PROFESSIONAL EXPERIENCE
Postdoctoral Research Fellow *January 2022 – present*
[Kavraki Lab](#), Department of Computer Science, Rice University.
Graduate Research Assistant *January 2020 – December 2021*
[VRRG](#), Department of Computer Science, Cornell University.
Graduate Research Assistant *August 2015 – December 2019*
Robotic Personal Assistants Lab, Department of Computer Science, Cornell University.
Software Engineering Intern *May 2015 – August 2015*
Fluencia, Alexandria, VA. Worked on adding voice recognition for speech practice exercises.
Undergraduate Research Assistant *August 2014 – July 2015*
Department of Computer Science, The University of Virginia. Work with Professor Westley Weimer on automatic software functionality transplantation.
Software Development Engineer Intern *May 2014 – August 2014*
Accounts Client Team, Microsoft, Redmond, WA. Implemented cryptographic operations and network protocol for passwordless login feature in Microsoft Accounts Android app.
Software Development Engineer Intern *May 2013 – August 2013*
Xbox LIVE Cloud Security Team, Microsoft, Redmond, WA. Designed and implemented a service for real-time logging and auditing of security records in Xbox LIVE. Initiated and completed a rewrite of an internal library to improve performance and provide a better API.
Undergraduate Research Assistant *January 2013 – May 2014*
Department of Computer Science, The University of Virginia. Work with Professor Gabriel Robins on real-time localization of objects using passive RFID tags.

TECHNICAL SKILLS
Programming Languages: Python, C++, Julia, Rust, Lua, C, Bash, etc.
Technologies: Linux, ROS, OMPL, Jax, PyTorch, Git, CUDA, SIMD programming, numerical optimization, etc.