

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 <i>Supervised by Dr. Lydia E. Kavraki.</i>	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	
EDUCATION	Cornell University , Ithaca, NY <i>Ph.D. in Computer Science. Advisor: Hadas Kress-Gazit.</i>	August 2015 – December 2021
	Cornell University , Ithaca, NY <i>MS in Computer Science. Advisor: Ross A. Knepper.</i>	August 2015 – June 2019
	University of Virginia , Charlottesville, VA <i>BS (with high distinction) in Computer Science and Mathematics</i>	August 2012 – May 2015
AWARDS	Computing Innovation Postdoctoral Fellowship <i>Computing Research Association (CRA) and National Science Foundation (NSF). 29% acceptance rate</i>	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
	Rodman Scholar <i>University of Virginia School of Engineering</i>	January 2013
PREPRINTS UNDER REVIEW	Dean's List <i>University of Virginia</i>	2012–2015
	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.	

PEER-REVIEWED CONFERENCE PUBLICATIONS	<ol style="list-style-type: none"> 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. 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.
THESES	<ol style="list-style-type: none"> 1. <i>A novel perspective on efficient integrated task and motion planning via differentiable distance-based predicate representations</i>. Wil Thomason. PhD Thesis, Cornell University. 2021.
TECHNICAL REPORTS	<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>
GRANTS	<p>NSF CCF #1646417: “Coordinated Action Among Independent Mobile Cyber-Physical Systems”. Co-authored with Ross A. Knepper (PI), Greg Morrisett (co-PI), and Abhishek Anand. 2016–2022. Award amount: \$799,995.</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 (virtual due to COVID-19) 2020 Selective annual workshop in conjunction with the Robotics: Science and Systems conference. Designed</p>

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)

TEACHING EXPERIENCE

CS 4750 (*Foundations of Robotics*) *Cornell University, Fall 2016 & Fall 2017*
Graduate TA (course design, syllabus creation, course notes authoring, coding project design and implementation, grading, office hours, lecturing). Senior and graduate-level elective. Awarded “Outstanding Teaching Assistant”.

CS 1110 (*Introduction to Computing Using Python*) *Cornell University, Fall 2015*
Head graduate TA (coordinating staff, giving review lectures, supervising lab sessions, grading, office hours). Introductory undergraduate CS course. Awarded “Outstanding Teaching Assistant”.

ENG 1501 (*Introduction to Aerial Robotics*) *University of Virginia, Fall 2014*
Instructor of record. 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 (office hours, grading). Senior-level elective.

CS 4710 (*Artificial Intelligence*) *University of Virginia, Spring 2015*
Undergraduate TA (assignment design and implementation, office hours, grading). Senior-level elective.

CS 4414 (*Operating Systems*) *University of Virginia, Spring 2014*
Undergraduate TA (office hours, assignment design and implementation, grading). 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.

RESEARCH SUPERVISION

PhD Students: Clayton Ramsey, Evan Dramko, Yiyuan Lee

Undergraduate Students: Stefan Bukorovic, Sofia Paola Medina-Chica, Priya Srikumar, Vineet Parikh

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

Organizer: [IROS 2022 Workshop on Evaluating Motion Planning Performance](#).

Faculty Chair: [RSS Pioneers 2021](#) workshop.

Reviewer:

- | | |
|--------------------------|---------------------|
| • AURO (2018) | • RA-L (2021–2023) |
| • ICRA (2016, 2019–2023) | • RO-MAN (2016) |
| • IJCAI (2021) | • RSS (2019) |
| • IJRR (2022–2023) | • SIMPAR (2018) |
| • IROS (2019, 2021–2023) | • T-ASE (2020–2021) |
| • MRS (2019) | • WAFR (2018) |

Departmental Service:

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| • Student representative to Diversity and Inclusion Committee (2020–2021) | • Head Colloquium Czar (2016–2019) |
| • Ph.D. Student Admissions Reviewer (2019) | • Colloquium Czar (2016–2020) |
| | • Ph.D. Mentor Czar (2016–2018) |

Other Service:

- ACM@UVa Academic Chair (2014–2015)

PROFESSIONAL EXPERIENCE

Postdoctoral Research Fellow

[Kavraki Lab](#), Department of Computer Science, Rice University.

January 2022 – present

Graduate Research Assistant

[VRRG](#), Department of Computer Science, Cornell University.

January 2020 – December 2021

Graduate Research Assistant

Robotic Personal Assistants Lab, Department of Computer Science, Cornell University.

August 2015 – December 2019

Software Engineering Intern

Fluencia, Alexandria, VA. Worked on adding voice recognition for speech practice exercises.

May 2015 – August 2015

Undergraduate Research Assistant

Department of Computer Science, The University of Virginia. Work with Professor Westley Weimer on automatic software functionality transplantation.

August 2014 – July 2015

Software Development Engineer Intern

Accounts Client Team, Microsoft, Redmond, WA. Implemented cryptographic operations and network protocol for passwordless login feature in Microsoft Accounts Android app.

May 2014 – August 2014

Software Development Engineer Intern

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.

May 2013 – August 2013

Undergraduate Research Assistant

Department of Computer Science, The University of Virginia. Work with Professor Gabriel Robins on real-time localization of objects using passive RFID tags.

January 2013 – May 2014

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.