Stephen Josef Wissow

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Education

University of New Hampshire — Ph.D. in Computer Science, 2020–present
Research interests: heuristic search, planning under time pressure, autonomous systems.
Advisor: Prof. Wheeler Ruml.
Relevant coursework:
- Planning for Robots (Prof. Wheeler Ruml)
- Machine Learning (Prof. Marek Petrik)
- Algorithms (Prof. Laura Dietz)
- Mathematical Optimization (Prof. Marek Petrik)

University of New Hampshire — M.S. in Computer Science, 2020
Thesis: *Time Enough: Synchronization for Latency Measurement.* Advisor: Prof. Radim Bartoš.
Reed College — B.A. in English, 2008
Thesis: *Ethics, Anti-elegy, and Specular* Aversio*: Language and Image in Li-Young Lee.* Advisor: Prof. Ellen Stauder.
Relevant coursework:
- Algorithms and Data Structures (Prof. Jim Fix)

Conference Publications

Stephen Wissow, Fanhao Yu, and Wheeler Ruml, "Tunable Suboptimal Heuristic Search," *Proceedings of the Seventeenth International Symposium on Combinatorial Search (SoCS-24)*, 2024.

Symposium and Workshop Publications

Caleb Hill, Stephen Wissow, and Wheeler Ruml, "Comparing Planners: Beyond Coverage Tables," Proceedings of the ICAPS-24 Workshop on the International Planning Competition (WIPC-24), 2024.

Stephen Wissow and Masataro Asai, "Scale-Adaptive Balancing of Exploration and Exploitation in Classical Planning," *Proceedings of the ICAPS-23 Workshop on Heuristics and Search for Domain-Independent Planning (HSDIP-23)*, 2023.

Awards

ACM SIGUCCS Communication Award of Excellence (joint with Chris Atkins) — 2011
Reed College Commendation for Academic Excellence — 2003–2004 and 2006–2007

Research Experience

UNH AI Group, Durham, NH
Graduate Research Assistant — May 2023–present
Investigated various problem settings related to planning under time pressure, including contract search (minimize solution cost subject to absolute bound on planning time) and tunable suboptimal search (best cost-time trade-off). (Prof. Wheeler Ruml)

MIT-IBM Watson AI Lab, Cambridge, MA
Graduate Research Intern — May–August 2022
Developed distributional heuristic, demonstrated its effect on classical planning domains.

Implemented MCTS/THTS framework in Pyperplan, developed tools to run experiments on IBM's Cognitive Compute Cluster.

UNH Center for Coastal and Ocean Mapping, Durham, NH
Graduate Research Assistant September 2020–January 2022

Compared real-time and offline anytime motion planning for autonomous surface vessels, with deployment to Lake Huron for remote, over-the-horizon autonomous operations.

Projects

Tunable Suboptimal Heuristic Search October 2023–present

Proposed new suboptimal heuristic search algorithm that is robust to state spaces with dead-ends and returns lower cost solutions at a given CPU time than previous algorithms, including standard benchmark and state-of-the-art bounded suboptimal algorithms.

Developed multi-domain heuristic search code base in Rust.

Distributional Heuristics Summer 2022–present

Graduate research internship project at *MIT-IBM Watson AI Lab*: developed and implemented distributional heuristic using principled approach based on randomized tie-breaking in popular classical planning heuristics. (Dr. Masataro Asai)

Planning with a Known Deadline Fall 2021–Fall 2023

Class project for *Planning for Robots*: Comparing different heuristics and error models for use in a deadline-aware version of beam search. (Prof. Wheeler Ruml)

Motion Planning with Dynamic Obstacles Fall 2020–Fall 2021

Research project implementing offline anytime BIT* in Rust and integrating into a field-tested ROS-based autonomy stack for a surface vessel. (Prof. Wheeler Ruml)

Data-Driven Dynamics Model for a Boat Spring 2021

Class project for *Machine Learning*: Used k-nearest neighbors to learn a data-driven model from physics-based simulated data as proof-of-concept for use in model-predictive control. (Prof. Marek Petrik)

Teaching Experience

UNH Department of Computer Science, Durham, NH
Instructor of Record: Theory of Computation (CS 659) Spring 2022, Spring 2023

Taught junior-level theory course on formal proofs, set theory, formal languages and grammars, finite automata, diagonalization, pumping, and computability to class of 40 students.

Supervised a undergraduate and graduate student graders.

Graduate Teaching Assistant: Algorithms (CS 758/858) August–December 2022

Presented weekly recitation with worked examples of lecture material.

Helped students improve understanding during weekly office hours.

Graduate Teaching Assistant: Assembly Programming (CS 520) Fall 2019

Presented best practices and answered debugging questions in lab sessions. Guided students in problem formulation and problem solving during office hours.

Instructor of Record: Android Programming (CS 580) Spring 2019

Presented lectures, developed group activities, graded programming assignments and problem sets, and solicited mid-course feedback from students.

Grader: Object-Oriented Design and Development (CS 619) Spring 2019

Graduate Lab Assistant: Algorithms and Data Structures (CS 515) Fall 2018

Encouraged students' mastery of GDB, Valgrind, and debugging.

Professional Experience

DRÄGER, Andover, MA

Software Engineering Intern May–August 2019

Developed Python wrapper for C library to drive EKG simulator for use in automated testing of patient monitor products.

Service

UNH M.S. THESIS COMMITTEES

Lizhi Xu, "GNSS-based Accurate One-way Latency Characterization of Transcontinental and Transoceanic Internet Paths," 2023.

UNH STUDENT ORGANIZATIONS

Graduate Student Parent & Caregiver Support Group 2019–2020

Co-founded group and organized events to help graduate students balance family caregiving and academic responsibilities.

REED COLLEGE COMMITTEES

Campus Climate Committee 2011–2014

Served as staff and alumni representative to craft campus-wide climate survey, collaborating with students, faculty, administrators, and an outside consultant to design a comprehensive assessment to further the college's inclusivity goals.

Computing Policy Committee 2006–2008

As student representative, critiqued and revised draft campus-wide computing policies for submission to the college administration.

Technology Advisory Committee 2005

As student representative, helped plan implementation of campus-wide LDAP directory system.

Current Skills

Rust, Python, C++; Slurm, Git, (Neo)Vim, Tmux, Bash.

Citizenship

U.S.A.