

Sam Williams

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Updated **January 2025**

EDUCATION

University of Southern California
Doctor of Philosophy in Computer Science
GPA: 4.0/4.0

Los Angeles, CA
Aug. 2022 - Current

University of Colorado Boulder
Bachelor of Science in Computer Science
GPA: 4.0/4.0

Boulder, CO
Aug. 2018 - May 2022
Summa cum laude, with Honors

Awards & Honors: Chancellor's Recognition Award, Mackison Writing Award, Wozniak Scholarship.

RESEARCH

University of Southern California
Graduate Research Assistant

Los Angeles, CA
Aug. 2022 - Current

- Advised by: Prof. Jyotirmoy Deshmukh.
 - Game-theoretic modeling of multi-agent autonomous systems.
 - Temporal logic based planning for multi-agent systems.

University of Colorado Boulder
Undergraduate Volunteer

Boulder, CO
Feb. 2021 - May 2022

- Volunteered with the ARPG research group.
 - Software improvements to an agile autonomous vehicle.

PROFESSIONAL EXPERIENCE

Scientific Software Developer Intern
Stellar Science

Albuquerque, NM
May 2021 - Aug. 2021

- Created code to compute intersections between simple geometric shapes for a satellite simulator.
- Added a GUI and visualization to compute and view resulting intersections in a user-friendly manner.

Scientific Software Developer Intern
Stellar Science

Albuquerque, NM
May 2020 - Aug. 2020

- Constructed a general-purpose C++ web framework used for multiple applications.
- Built an asynchronous, multithreaded, high performant HTTP/1.1 server in C++17 using Boost.Beast and Boost.Asio with careful consideration to the HTTP RFC specification to replace a deprecated library.

Undergraduate Software Developer Intern
Terumo BCT

Lakewood, CO
May 2019 - Aug. 2019

- Customized the operating systems for an i.MX8 board using Yocto and implemented a NFS boot environment complete with U-Boot scripts for developer integration.
- Investigated the feasibility of attaching an additional board without storage for video streaming.

TEACHING

University of Southern California

Teaching Assistant CSCI 513: Autonomous CPS.

Los Angeles, CA

Fall 2023

University of Colorado Boulder

Course Assistant CSCI 2820: Linear Algebra with CS Applications.

Course Assistant CSCI 3434: Theory of Computation.

Boulder, CO

Spring 2022

Fall 2021

JOURNAL PUBLICATIONS

- [1] **S. Williams** and J. Deshmukh, “Potential games on cubic splines for self-interested multi-agent motion planning,” *IEEE Control Systems Letters*, vol. 8, pp. 2487–2492, 2024, Conference Name: IEEE Control Systems Letters, ISSN: 2475-1456. DOI: [10.1109/LCSYS.2024.3491052](https://doi.org/10.1109/LCSYS.2024.3491052).

CONFERENCE PUBLICATIONS

- [2] **S. Williams** and J. Deshmukh, “Potential games on cubic splines for multi-agent motion planning of autonomous agents: Extended abstract,” in *Proceedings of the 23rd International Conference on Autonomous Agents and Multiagent Systems*, ser. AAMAS ’24, Auckland, NZ: International Foundation for Autonomous Agents and Multiagent Systems, May 6, 2024, pp. 2555–2557, ISBN: 9798400704864.
- [3] N. Hashemi, **S. Williams**, B. Hoxha, D. Prokhorov, G. Fainekos, and J. Deshmukh, “LB4tl: A smooth semantics for temporal logic to train neural feedback controllers,” in *The 8th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS)*, Boulder, CO, Jul. 2024.

ORAL PRESENTATIONS

- [4] **S. Williams** and J. Deshmukh, “Potential games on cubic splines for multi-agent motion planning,” INFORMS Optimization Society (IOS), Houston, TX, Mar. 2024.
- [5] A. Adimoolam, I. Saha, and T. Dang, “Safe self-triggered control based on precomputed reachability sequences,” in *Proceedings of the 26th ACM International Conference on Hybrid Systems: Computation and Control*, ser. HSCC ’23, New York, NY, USA: Association for Computing Machinery, May 9, 2023, pp. 1–12, ISBN: 9798400700330. DOI: [10.1145/3575870.3587124](https://doi.org/10.1145/3575870.3587124).

POSTER PRESENTATIONS

- [6] **S. Williams** and J. Deshmukh, “Infinite horizon control synthesis for linear temporal logic specifications,” USC Center for Autonomy and AI Workshop on AI Safety in the GenAI Era, Los Angeles, CA, Oct. 2024.
- [7] **S. Williams** and J. Deshmukh, “Potential games on cubic splines for multi-agent motion planning,” IEEE RAS Summer School on Multi-Robot Systems, Prague, CZ, Jul. 2024.
- [8] S. Paul, **S. Williams**, and J. Deshmukh, “Game theoretic methods for planning,” *USC Center for Autonomy and AI Workshop on AI-Driven Safe Autonomy*, Oct. 2023, Poster presentation.

SERVICE

Software Seminar Host <i>University of Southern California</i> <ul style="list-style-type: none">Organized and hosted a weekly seminar for PhD students to present their ongoing research on topics related to software engineering research.Typically attended by an audience of 20-30 graduate students and professors.	Los Angeles, CA Spring 2023 Fall 2023 Spring 2024
Refereed Papers (reviewer) Nonlinear Dynamics International Conference for Robotics and Automation (ICRA)	 2024 2024
Refereed Papers (subreviewer) Learning for Decision and Control (L4DC) Verification, Model Checking, and Abstract Interpretation (VMCAI) Hybrid Systems: Computation and Control (HSCC) American Control Conference (ACC) International Conference on Computer Aided Verification (CAV) IEEE Conference on Decision and Control (CDC)	 2025 2024, 2025 2024 2023 2023 2023