Sam Williams

Website: https://sjwil.github.io/personal-site/   Updated **May 2025**
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EDUCATION

University of Southern California   Los Angeles, CA
Doctor of Philosophy in Computer Science   **Aug. 2022 - Current**
GPA: 4.0/4.0

University of Colorado Boulder   Boulder, CO
Bachelor of Science in Computer Science   **Aug. 2018 - May 2022**
GPA: 4.0/4.0   *Summa cum laude, with Honors*

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

RESEARCH

University of Southern California   Los Angeles, CA
Graduate Research Assistant   **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   Boulder, CO
Undergraduate Volunteer   **Feb. 2021 - May 2022**
- Volunteered with the ARPG research group.
  - Software improvements to an agile autonomous vehicle.

PROFESSIONAL EXPERIENCE

Scientific Software Developer Intern   Albuquerque, NM
Stellar Science   **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   Albuquerque, NM
Stellar Science   **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   Lakewood, CO
Terumo BCT   **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   Los Angeles, CA
  Teaching Assistant CSCI 513: Autonomous CPS.   **Fall 2023**

University of Colorado Boulder   Boulder, CO
  Course Assistant CSCI 2820: Linear Algebra with CS Applications.   **Spring 2022**
  Course Assistant CSCI 3434: Theory of Computation.   **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.

Conference Publications

[2] **S. Williams** and J. Deshmukh, "Automatic synthesis of smooth infinite horizon paths satisfying linear temporal logic specifications," presented at the 37th International Conference on Computer Aided Verification, Zagreb, HR: Springer Nature Switzerland (to appear).

[3] **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.

[4] 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

[5] **S. Williams** and J. Deshmukh, "Potential games on cubic splines for self-interested multi-agent motion planning.," 2025 American Control Conference (ACC), Denver, CO, Jul. 2025.

[6] **S. Williams** and J. Deshmukh, "Potential games on cubic splines for multi-agent motion planning.," INFORMS Optimization Socity (IOS), Houston, TX, Mar. 2024.

[7] 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.

Poster Presentations

[8] **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.

[9] **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.

[10] 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 — Los Angeles, CA
University of Southern California — **Spring 2023**, **Fall 2023**, **Spring 2024**
- 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.

Refereed Papers (reviewer)

Nonlinear Dynamics	2024
International Conference for Robotics and Automation (ICRA)	2024

Refereed Papers (subreviewer)

International Conference on Embedded Software (EMSOFT)	2025
Learning for Decicion and Control (L4DC)	2025
Verification, Model Checking, and Abstract Interpretation (VMCAI)	2024, 2025
Hybrid Systems: Computation and Control (HSCC)	2024
American Control Conference (ACC)	2023
International Conference on Computer Aided Verification (CAV)	2023
IEEE Conference on Decision and Control (CDC)	2023