

## PROFILE

I am an undergrad in Computer Science at Caltech. I am interested in novel applications of computer science across all domains such as aerospace, communications, cybersecurity, and AI. Following my undergrad, I hope to become a PhD and pursue a career in academia.

## EDUCATION

- **Caltech** September 2022 - June 2026  
*B.S. in Computer Science* Pasadena CA, USA

## EXPERIENCE

- **Gharib Lab, Caltech** [🌐] November 2023 - Present  
*Undergraduate Researcher* Pasadena CA, USA
  - Created GPU-accelerated image processing software to analyze fluid flow 1000x faster than any commercially available software, 2 papers & 2 patents
  - Created software for low-latency vision language models
- **Information Processing Group, NASA Jet Propulsion Lab** [🌐] June 2023 - Present  
*Undergraduate Researcher* Pasadena CA, USA
  - Created a program to encode and decode laser signals as part of the Deep Space Optical Communications team which allows data to be downloaded 100x faster than radio
  - Program receives signals from the NASA Psyche spacecraft and from astronauts on the Orion spaceship
    - \* [NASA laser message beams video of a cat named Taters back to Earth, and it's a big deal - CNN](#)
  - Designed & created GPU-based optical communications receiver
    - \* Achieved world record for the highest link difficulty (bitrate · distance<sup>2</sup>) of any real-time communication system (75 Mbps @ 2.25 · 10<sup>8</sup> km), outperforming previous FPGA-based systems
- **NASA Advanced Supercomputer Center** [🌐] June 2024 - Present  
*Research Associate* Moffett Field CA, USA
  - Created an AI chatbot and search engine app that cites millions of scientific and business documents
  - [Deploying the app across NASA](#), currently beta testing at Ames Supercomputing Division
- **Caltech Infrared Processing and Analysis Center** [🌐] February 2024 - June 2025  
*Mission Operations and Ground Data Systems* Pasadena CA, USA
  - Wrote software for the Lunar Trailblazer spacecraft, launched February 2025
  - Mission control for Lunar Trailblazer on launch day, monitoring spacecraft telemetry
    - \* Rapidly wrote software to [decode anomalous telemetry the day after launch](#)
- **NVIDIA** [🌐] June 2025 - September 2025  
*Software Engineering Intern* Santa Clara CA, USA
  - Systems software for autonomous vehicles (Mercedes-Benz & Jaguar)
  - Improved camera and radar processing verification
- **Nelson Lab, Caltech** [🌐] September 2024 - Present  
*Undergraduate Researcher* Pasadena CA, USA
  - Designed software system for high-throughput electron diffraction data processing
- **Feinberg Lab, Yale** [🌐] May 2020 - June 2023  
*High School Intern* New Haven CT, USA
  - Created data analysis pipelines for the Feinberg Laboratory at Yale University for Bayesian analysis of the Social Valuation Task, neuroeconomic task to measure suicide ideation
  - Presented findings in a short talk/poster at national Technology in Psychiatry (TIPS) conference

## LEADERSHIP EXPERIENCE

- **Teaching Assistant, Caltech** September 2023 - June 2025  
*Head Teaching Assistant* Pasadena CA, USA
  - CS 171: *Computer Graphics Laboratory* TA Fall 2024, Head TA Fall 2025, 2026
  - CS 179: *GPU Programming* TA Fall 2024, Head TA Spring 2025, 2026
    - \* Created assignment where students program a large language model from scratch in CUDA
- **Caltech Undergraduate Computer Science Club** [🌐] September 2023 - August 2025  
*President* Pasadena CA, USA
  - Managed a club budget of ≈ \$24,000, organizing club events, and maintaining relations with external sponsors, including NVIDIA and Relativity Space, interested in giving and working with our club.
  - For instance, we worked on purchasing computer parts and getting free GPUs from NVIDIA, built a computer cluster from these parts, and now actively operate it for club members.

## PUBLICATIONS

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- S. Bollt, **S. Foxman**, M. Gharib. "RapidPIV: Full Flow-Field kHz PIV for Real-Time Display and Control". Submitted to *Measurement Science & Technology*, 2025. Preprint <https://www.arxiv.org/abs/2504.17987>.
- L. Coffin, A.J. Torres, S. Wallen, P. Calub, K. Gauld, I. Kwaterski, **S. Foxman**, H. Ramsperger, E. Xu, ..., K. Carpenter, S.J. Chung. "PILLARS: Plume-Deployed Inflatable for Launch and Landing Abrasive Regolith Shielding". *AIAA Aviation Forum and Ascend*, July 2025. <https://doi.org/10.2514/6.2025-4126>
- B. Ehlmann, ..., **S. Foxman**, ..., and the Lunar Trailblazer Team. "Lunar Trailblazer Spacecraft Tracking and Mission Recovery Attempt: Characterization of Status and Behavior of a Non-Cooperative Object in Cis-Lunar Space " Manuscript submitted, August 2025
- D. Eremin, K. Jha, D. Delgadillo, H. Zhang, **S. Foxman**, S. Johnson, N. Vlahakis, D. Cascio, V. Lavallo, J. Rodriguez, H. Nelson. "Spatially-Aware Diffraction Mapping Enables Fully Autonomous MicroED". In review at *Journal of the American Chemical Society (JACS)*, 2025
- B. Ehlmann, ..., **S. Foxman**, ..., and the Lunar Trailblazer Team. "The Lunar Trailblazer Mission: Science Motivation and Implementation of a Pioneering Small Satellite for Lunar Water and Lunar Geology in the NASA SIMPLEX program". Submitted to *Journal of Geophysical Research*, August 2025
- **S. Foxman**, D. Dalle. "NASA-GPT". Manuscript in preparation. September 2025
- **S. Foxman**, R. Rogalin. "GPU Receivers for Deep Space Optical Communications". Presenting at *SPIE Photonics West, Free-Space Laser Communications XXXVIII*, January 2026.

## INVENTIONS

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- S. Bollt, **S. Foxman**, M. Gharib. "Portable Real-Time Optical Flow-Field Sensor". U.S. Patent Application No. 63/715,303. November 2024
- **S. Foxman**, R. Rogalin. "GPU-Based Optical Communications Modem". Software available under license from Caltech/NASA Jet Propulsion Laboratory. June 2025
- **S. Foxman**, S. Bollt, M. Gharib. "Systems and Methods for Optical Flow Using GPU Tensor Processing Cores". U.S. Patent Application No. 63/823,578. June 2025

## SKILLS

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- **Programming Languages and Frameworks:** C++, Linux, Java, Python, Rust, CUDA, OpenGL, MATLAB, Jupyter, C, JavaScript, Full-Stack Development, Computer Networking, R, SQL, Bash
- **General:** Sysadmin, Cloud Servers, CAD, Embedded Systems, FPGA Software Programming, Robotics, 3D Printing, EEG Preprocessing Pipeline, HPC (High performance computing), Information Retrieval, AI, Wireless Communication