

# SAM SCHEELE

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Specializes in robotics and machine learning, with a proven track record of building AI systems for challenging environments. Broad technical experience: LLMs/VLMs, computer vision, controls, DevOps/MLOps. Read my blog!


## SKILLS

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- **Programming Languages:** Python, Rust, C/C++, Javascript, Java, Julia, Zig
- **Robotics:** Dexterous manipulation, close-proximity human-robot collaboration, motion planning, controls (PID, LQR, MPC), perception, state estimation, deep RL for controls
- **Data Science & Machine Learning:** Pytorch, MLFlow, Huggingface, Pandas, scikit-learn, LLMs, RAG, Computer Vision, data processing/discovery, model deployment, knowledge graphs
- **DevOps & Version Control:** Git, Docker, CI/CD (GitHub Workflows), Agile
- **Research Skills:** Mathematical derivations, algorithm development, technical blogging, experimental design, data visualization, literature review, problem-solving, teaching and communication

## EXPERIENCE

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- **MIT Lincoln Laboratory** 



Feb. 2024 - Present  
Lexington, MA

Associate Member of Technical Staff

  - Conceived and pitched a new program combining RAG with LLM-based code generation for **drone-based disaster response** use cases within first ten weeks of employment, **receiving \$200k in initial funding**. Currently acting as **Principal Investigator** on the program, managing both technical and logistical aspects.
  - Demonstrated aptitude for transforming research into real-world impact by serving as primary technical contributor in three projects and reports **successfully deployed to FEMA, HHS, and USAF**.
  - **Boosted development speed by 25%** group-wide by spearheading effort to host internal code completion models.
  - **Modernized group workflows** by initiating DevOps and MLOps efforts, deploying first Grafana dashboards, first experiment tracker, first CI/CD pipeline, custom logging solutions, first model server, first ML observability platform, and many other services, deployed with Docker.
  - Trained and released open-source models and dataset for classification of aerial disaster imagery. Models reached **more than 5k downloads**.
  - Developed machine learning model to **predict earthquakes using ionospheric data with 87.7% accuracy**. Accelerated iteration time by **more than 100x** by implementing **multi-node distributed training** and improving data coherency to reduce frequency of disk accesses.
  - RAG projects: developed, deployed, and **iterated based on user interviews** for several projects utilizing Retrieval-Augmented Generation (RAG) and agentic RAG for sponsored and internal "blue sky" projects.
  - Served as Lead Instructor of MIT Beaver Works Summer Institute class in Remote Sensing for Disaster Relief, teaching elements of GIS analysis, remote sensing, machine learning, logistics, and more. **Led a team of two co-instructors and five TAs** to create course material and instruct a class of high school students.
  - Presented findings at conferences, including CVPR EarthVision, and directly to existing and prospective sponsors.
- **Internships**

Summer 2018, 2019

Intern

  - **The Aerospace Corporation** : Generated challenging synthetic datasets using Unreal Engine for training computer vision algorithms on RGB-D data.
  - **Georgia Tech Research Institute** : Implemented heterogenous compliance controller (position control targets in some axes, force targets in others) by independently deriving nonsingular compliant control code on 6dof robotic arm. Final product was able to faithfully recreate vector graphics by drawing them on a whiteboard.
- **(TA) Robotics and Perception Class, Georgia Institute of Technology**

Fall 2021  
Atlanta, GA

Head TA

  - Led a team of 10 TAs to teach the principles of robotics software to a class of 150 students at Georgia Tech.
  - Designed course content, coordinated TA efforts, and modified both internal and student-facing course policies to maximize course legibility and minimize administrative overhead.
  - Performed at the highest possible tier on all 12 student evaluation metrics on end-of-semester survey.

## EDUCATION

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- **Georgia Institute of Technology**

August 2021 - July 2023  
Atlanta, GA

MS Computer Science, specialization in Robotics and Computational Perception

  - GPA: 4.0/4.0 (Highest Honors)
  - Thesis: "Anticipatory and Reactive Motion Planning"

BS Computer Science, minor in Robotics

August 2017 - July 2021

  - GPA: 3.8/4.0 (Highest Honors)

## PROJECTS AND VOLUNTEER WORK

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- **Open Source Contributor: Helix Editor**

Spring 2023

Tools: Rust



- Contributed to code and documentation of Helix, a modal text editor and IDE used by tens of thousands of people. Learned the systems programming language Rust in order to make meaningful contributions.
- Extended editor functionality by adding feature to respect gitignore files, enabling greater project flexibility.
- Optimized performance by skipping rendering for graphemes not in editor viewport.

- **Prototyping Instructor, Georgia Tech Invention Studio**

2021-2023

Tools: waterjet, FDM and resin 3D printers, laser cutters, manual mill, wood shop, metal shop, electronics bench

- Assisted students and faculty on a volunteer basis with designing and building prototypes and proofs-of-concept at the Georgia Tech Invention Studio, the largest student-run prototyping facility in the US.
- Provided training on many of the tools available in the Studio with the goal of empowering users.

- **LLM Poker Tutor**

2025-Present

Tools: FastAPI



- Developed a browser-based web application to teach poker skills by integrating an LLM-based tutor into a virtual poker game. The tutor can give specific guidance based on the current hand and is guided by the results of a poker solver, so it can reliably find and explain the best play on each street

## PUBLICATIONS

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Abhinav Jain, Daphne Chen, Dhruva Bansal, **Sam Scheele**, Mayank Kishore, Hritik Sapra, David Kent, Harish Ravichandar, and Sonia Chernova (2020). *Anticipatory Human-Robot Collaboration via Multi-Objective Trajectory Optimization*. arXiv: [2006.03614](https://arxiv.org/abs/2006.03614) [cs.RO]. URL: <https://arxiv.org/abs/2006.03614>.

Jessica Reid, Jeffrey Liu, **Sam Scheele**, Bhavani Ananthabhotla, Matthew Weiss, and Dieter Schuldt (Dec. 2021). “QuakeCast: Forecasting Earthquakes from Preseismic Ionospheric Signals Using Machine Learning Refinements and Advances”. In: *AGU Fall Meeting Abstracts*. Vol. 2021, NH35D-0494, NH35D-0494.

**Sam Scheele** (2023). “Anticipatory and Reactive Motion Planning”. MS Thesis. Georgia Institute of Technology.

**Sam Scheele**, Pierce Howell, and Harish Ravichandar (2023). *Fast Anticipatory Motion Planning for Close-Proximity Human-Robot Interaction*. arXiv: [2305.11978](https://arxiv.org/abs/2305.11978) [cs.RO]. URL: <https://arxiv.org/abs/2305.11978>.


Emma McDaniel, **Sam Scheele**, and Jeff Liu (2024). *Zero-Shot Classification of Crisis Tweets Using Instruction-Finetuned Large Language Models*. arXiv: [2410.00182](https://arxiv.org/abs/2410.00182) [cs.CL]. URL: <https://arxiv.org/abs/2410.00182>.

**Sam Scheele**, Katherine Picchione, and Jeffrey Liu (2024). *LADI v2: Multi-label Dataset and Classifiers for Low-Altitude Disaster Imagery*. arXiv: [2406.02780](https://arxiv.org/abs/2406.02780) [cs.CV]. URL: <https://arxiv.org/abs/2406.02780>.

## ADDITIONAL INFORMATION

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**Languages:** Spanish (Conversational), Italian (Beginner)

**Interests:** Blog , mathematical puzzles, meditation, language learning, cooking