# Open Position:
# Ph.D. Student in Robotics/Control/ML

**About the SPARC Lab**: The SPARC (**S**afe + **P**erformant **A**utonomous **R**obotics & **C**ontrol) Lab at Tufts University is a research lab led by Professor Ryan K. Cosner that works at the intersection of robotics, control theory, and machine learning to develop safe and performant robot autonomy. The lab's vision is to develop safe, deployable, and trustworthy autonomy algorithms that enable robots to work capably and confidently alongside humans. Our research approach follows a theory-algorithm-application loop where we develop application-motivated theory and use that to design provably sound algorithms that we deploy on real-world systems. Please see our website at sites.tufts.edu/sparc/ to learn more about the lab.

**Position Description**: The lab is recruiting talented, passionate, and driven engineers to join our team as fully-funded Ph.D. students. We will be reviewing and admitting students in the 2025-2026 application cycle, for a start date in Fall 2026. Lab members will participate in the Tufts University Mechanical Engineering Ph.D. program or a related degree program and will perform academic research in collaboration with Prof. Cosner. Please see the SPARC Lab FAQ page for additional information about the lab including conference travel, advising style, publication venues, student expectations, etc.

- Start Date: September, 2026
- Expected Duration: 5 years
- Work type: full-time, flexible hours, in-person
- Location: Medford, Massachusetts
- Funding and benefits will be through RA or TAships in accordance with Tufts Graduate Assistants Collective Bargaining Agreement

**Research Directions**: Potential research directions include: aligning mathematical safety concepts with human preferences, developing methods to rapidly and automatically synthesize safety algorithms in novel environments, deriving practically useful safety guarantees using realistic uncertainty models, and studying the utility of combined first-principles and data-driven models to close the sim-to-real gap and enhance real-world deployment. Please see sites.tufts.edu/sparc/research/ for additional information and relevant publications from the lab on each of these research directions.

While these are potential directions, it is expected that research projects will evolve as we follow the path of scientific inquiry and adapt each project to best suit the student's individual interests. The unifying ideas across all projects will be that they (1) advance the state-of-the-art in safe robot autonomy and (2) involve a mixture of theoretical analysis, algorithm development, and hardware deployment.

**Research Equipment Resources**: A core mission of the SPARC Lab is the validation of our theoretical results on physical systems. We are committed to equipping the lab with a cutting-edge suite of robots, sensors, and computers. The planned equipment, subject to research priorities, includes a motion capture system, GPU cluster, quadrupedal robot, humanoid robot, manipulator robot, and quadrotor swarm. Additional/alternative equipment will be acquired to support student research directions as needed.

**Required Qualifications**:

- Bachelor's or Master's degree in Mechanical Engineering, Electrical Engineering, Computer Science, or a closely related field by Fall 2026.
- Demonstrated interest in robotics, machine learning, and/or control theory.
- Coursework in dynamics and control theory.
- Proficiency in a programming language (e.g., C++, Python, Matlab, Julia).
- Demonstrated experience with robotics hardware.
- Academic communication experience (a research publication is not required, but the applicant should be comfortable communicating technical ideas in a research context).
- Teamwork, independent research, and project management skills.

**Preferred Qualifications**:

- Experience using machine learning tools (e.g., PyTorch, TensorFlow, Weights and Biases).
- Coursework in probability, data science, probabilistic robotics, linear algebra, analysis, optimization, and nonlinear control.
- Record of academic research communication (e.g., research publication, conference talk, poster presentation).
- Robotics hardware design, construction, and system integration experience.
- Experience with robot sensing and perception methods.
- Experience with edge and embedded compute devices (e.g., NVIDIA Jetson, RaspberryPi, Teensy, Arduino).
- Experience with robot simulators (e.g., NVIDIA Isaac Sim, MuJoCo)
- Experience with other relevant software and computing tools such as ROS/ROS2, Linux, CVX, Git, Solidworks, Latex

**How to Apply**: Applicants should apply directly to the Tufts University Department of Mechanical Engineering Ph.D. Program.

- Program details and application instructions can be found at the Tufts ME PhD webpage. Please mention my name in your application.
- Please send an email to *ryan.cosner@tufts.edu* after you have submitted your application.
- ***Application deadline: ~~December 15, 2025~~ extended to January 15, 2025***
- If the application fee presents a financial hardship, please contact the Tufts Office of Graduate Admissions.

**Contact Information**:

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