Sadhana Kumar

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EDUCATION

Georgia Institute of Technology (*Georgia Tech)* | Atlanta, GA — Expected May 2026
B.S. Mechanical Engineering*, *Minor: Robotics — *Cumulative GPA: 3.77*
Stamps President's Scholar *(awarded to the top 1% of Georgia Tech applicants)*

CORE SKILLS

Technical Software – Siemens NX (incl. NX Open, PCB Exchange), SOLIDWORKS, Autodesk Inventor, Teamcenter
Fabrication – FDM/PLA 3D-Printing, Waterjet, Laser-cutter
Programming – MATLAB, Python, Java, C#, R, Swift, JavaScript, Arduino, ROS, data analysis, data visualization
Leadership – project management, agile methodologies, team building, fundraising

RESEARCH

Aerospace Robotics Laboratory at Georgia Tech | Atlanta, GA — 01/2025 – present
Advisor: Dr. Yashwanth Kumar Nakka
Funded by: Georgia Tech Undergraduate Research Opportunities Salary Award

Lunar Rover Platform for Multi-Agent Autonomy

- Designing electrical system, incl. power calculations, battery sizing, and detailed wiring/ communication diagrams
- Integrating electrical and mechanical systems by optimizing chassis layout for efficient connectivity, reducing space usage by 50% while meeting <$2k budget and 1-hour runtime targets on 12V system
- Leading team in developing and testing 2nd version of rover for simulated lunar terrain; poster accepted for presentation at Lunar Surface Innovation Consortium

Multimodal Rover

- Designing 8:1 dual-disk cycloidal actuator for legged robot pitch joint, optimizing motor selection and geometry for high torque density in 24V system

Georgia Tech Advanced Manufacturing Pilot Facility | Atlanta, GA — 01/2023 – present
Advisors: Dr. Aaron Stebner, Dr. Zachary Brunson
Funded by: Georgia Tech President's Undergraduate Research Award

Plastic Sealing for Density Measurement Automation of Additively Manufactured (AM) Parts

- Designing study on plastic sealing alternatives for density testing of AM parts aimed at reducing sealing time by >25 minutes per sample compared to traditional oil impregnation methods

Schlieren Fluid Flow Visualization System Development

- Implementing high-resolution schlieren gas flow visualization system within Optomec DED printer to analyze powder flow dynamics during metal 3D printing process

CONFERENCE AND POSTER PRESENTATIONS

S. Kumar, I. Chen, A. Gupta, C. Delgandio, Z. Brunson, A. Stebner. "Schlieren: Gas Flow Visualization". Presented at the Georgia Tech 4.0 Manufacturing Consortium, January 2025.

V. Griffo, **S. Kumar**, Y. Nakka. "GROVER: A Variable Height Grouser Wheel for Enhanced Terrain Adaptability". Poster presented at the Georgia Tech College of Sciences EXPLORE Open House & Stamps Scholars Summit, March 2025.

V. Griffo, **S. Kumar**, Y. Nakka. "GROVER: A Variable Height Grouser Wheel for Enhanced Terrain Adaptability". Talk given at the Georgia Tech Undergraduate Research Symposium, April 2025.

S. Kumar, V. Griffo, Y. Nakka. "NOVA: A Rover Platform for Navigation, Operations, and Validation of Autonomy Algorithms". Poster abstract accepted for the JHU APL Lunar Surface Innovation Consortium under NASA's Lunar Surface Innovation Initiative, November 2025.

INDUSTRY INTERNSHIPS

CAD Applications Engineering Intern – Apple | Cupertino, CA — 05 – 08/2024

- Led development of custom Siemens NX tool for large assembly cross-sectional image creation to improve FEA result interpretation for threaded fastener joins, reducing 2-day FEA process to under 1 hour
- Created classification library in NX and Teamcenter that enabled fastener searches by geometric attributes to improve screw fastener selection workflows and data collection for product design and FEA teams
- Wrote Confluence documentation with custom NX drawings for 20+ attributes of mechanical fastener library
- Tested PCB design rule checks and optimized MCAD-to-ECAD data exchange after completing training on PCB

Exchange and flexible PCB design in NX
- Helped develop iOS/visionOS app using augmented reality to visualize CAD assemblies during design reviews
- Delivered 1-hour presentations to 2 teams, 3 managers, and 2 senior managers on created mechanical fastener simulation workflow, covering FEA software basics, analysis procedures, and process improvements

Process Design and Development Intern – The Timken Company | North Canton, OH 05 – 08/2023
- Designed and modeled more efficient bearing assembly tooling system in NX, incorporating hand-crank powered lead screw table and mounting plates that reduced operator points of contact by 50%
- Wrote multilingual (Spanish and English) work instructions for bearing quality testing tooling, ensuring compliance with workplace standards and safety measures for smooth manufacturing integration
- Completed 4-day training program on bearing fundamentals, housings, and power transmission products

Software Engineering Intern – WP Engine | Austin, TX 06 – 08/2022
- Programmed 8 new icons into the Simple Social Icons plugin for WordPress and led its release to 200,000+ users by participating in code reviews and furthering coding knowledge through JavaScript courses
- Developed drag and drop WordPress theme generation UI using JS, HTML, and CSS with 5 other engineers, implementing solutions based on alpha launch participant feedback

TEACHING AND MENTORING

Grader, Undergraduate Heat Transfer (ME 3345) – Georgia Tech | Atlanta, GA 08/2025 – present
- Hold weekly office hours and answer heat transfer concept-related questions over email
- Grade homework for 60 students and provide detailed feedback on errors

Mentor – Clarkston High School VEX Robotics Team | Clarkston, GA 10/2024 – 05/2025
- Mentored newly established high school VEX robotics team, dedicating 2 hours per week to guide students in robot design and offering CAD and engineering design tips
- Provided feedback on prototyping and problem-solving strategies to enhance team's competitive readiness

LEADERSHIP AND EXTRACURRICULAR

Member – GT Mechanical Engineering Student Advisory Committee | Atlanta, GA 08/2024 – present
- Advising leadership of the undergraduate mechanical engineering program monthly on student success and implementation of the school's strategic plan
- Assisting with interviews and selection for the new mechanical engineering school chair
- Leading outreach efforts by presenting Georgia Tech's Mechanical Engineering program to prospective high school students, providing insights on academics, research, and student life

Volunteer Researcher – Robotarium at Georgia Tech | Atlanta, GA 01/2024 – 01/2025
- Compiled comprehensive guides in MATLAB and Python detailing the fundamentals of coding robots to execute designated paths and more complex simulation tasks
- Developed and executed solution to address critical issue of robots becoming immobilized in flooring of simulator bed during charging, ensuring uninterrupted operation and completion of tasks

Proposal Writing and Evaluation Experience – NASA, Arizona State University | Virtual 06 – 08/2024
- Proposed robotic arm for lunar sample collection that was designed to fit around astronaut's center of mass in space and support various end effectors for different sample collection procedures, reducing fatigue and muscle strain by eliminating bending motions
- Led review panel with 10 students of other proposals, evaluating 4 projects using NASA's New Technology Report and proposal evaluation systems

Mission Concept Academy – NASA, Arizona State University | Virtual 09 – 12/2023
- Led GNC system design as team member in simulated orbiter mission aimed at exploring Enceladus for potential signs of life
- Implemented NASA's project workflow by organizing and facilitating key project reviews, including Mission Concept Review, System Requirements Review, Mission Design Review, and Preliminary Design Review

RoboWrestling Mechanical Subteam Member – RoboJackets | Atlanta, GA 08/2022 – 05/2023
- Designed robots for robot sumo using CAD, considering design specifications, materials, and ease of manufacturing with the intention of competing in international robotics competitions; participated in concentric design reviews and identify areas for optimization
- Manufactured robots using mills, lathes, waterjets, and 3D printers in collaboration with electrical & software teams

PROFESSIONAL AFFILIATIONS

American Society of Mechanical Engineers 08/2022 – present
Society of Women Engineers 08/2022 – present
American Institute of Aeronautics and Astronautics 09/2023 – present