

Tarun Vinodkumar

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EDUCATION

Georgia Institute of Technology | Atlanta, GA

May 2026

Candidate for Bachelor of Science in Mechanical Engineering

GPA: 4.00

- Concentration in Automation and Robotic Systems

SKILLS

Software: SolidWorks, Inventor, Fusion 360, VS Code, Microsoft Access, Microsoft Excel, Minitab
Machinery: 3D Printer, Laser Cutter, Solder, Band Saw, Handheld Power Tools
Programming: MATLAB, C, Arduino, Python, Java, SQL
Communication: Design proposals, Presentations (large and small audiences), Formal papers
Spoken Languages: English, Tamil, Telugu, Spanish

PUBLICATIONS

Journal Publications

- Hong, C. P., **Vinodkumar, T.**, Nieves-Vazquez, H. A., & Ueda, J. (2024). Sensor-Embedded Tissue Phantom for Magnetic Resonance Elastography Mechanical Failure Testing. *Journal of Medical Devices*, 18(4), 041003. <https://doi.org/10.1115/1.4066226>

SELECTED PRESENTATIONS

- **Vinodkumar, T.**, Hong, C., Nieves-Vazquez, H., Ueda, J. "Sensorized Tissue Phantom for Magnetic Resonance Elastography Benchtop Mechanical Failure Detection", **2024 Undergraduate Research Symposium**; April 2024
- Hong, C., **Vinodkumar, T.**, Nieves-Vazquez, H., Ueda, J. "Sensorized Tissue Phantom for Magnetic Resonance Elastography Benchtop Mechanical Failure Classification", **2024 Shriners Children's State of the Science Conference**; February 2024
- Hong, C., **Vinodkumar, T.**, Nieves-Vazquez, H., Ueda, J. "Sensorized Tissue Phantom for Magnetic Resonance Elastography Benchtop Experimentation", **2023 Georgia Undergraduate Research Conference**; November 2023

HONORS AND AWARDS

- Georgia Tech Organization of the Year - MedTech Hack April 2025
- President's Undergraduate Research Award (\$3000 total) Jan 2024, Jan 2025
- Georgia Tech Faculty Honors 2022-2025
- Fulbright Canada-MITACS Globalink Research Internship (Declined Offer) Nov 2024
- Georgia Tech President's Undergraduate Research Travel Award Oct 2023
- National Merit Scholarship Finalist Feb 2022
- Scouting America (formerly Boy Scouts of America) Eagle Scout Aug 2019

RESEARCH EXPERIENCE

Researcher | **Biorobotics and Human Modeling Lab** | Atlanta, GA

Mar 2023 – Present

Principal Investigator: Dr. Jun Ueda

- Designed a laparoscopic instrument with integrated imaging and conducting multi-objective optimization and constraint studies, leading to invention disclosure -- journal paper in preparation for submission to ASME Journal of Medical Devices
- Engineered a sensorized tissue phantom and testbed setup for accurately measuring and characterizing different magnetic resonance elastography (MRE) actuators, promoting overall MRE advancement
- Designed a 15-part assembly of a 2-degree-of-freedom MRI-compatible robot in SolidWorks for MRE procedures, enhancing the angle of actuation from 90 to 180 degrees

INDUSTRY EXPERIENCE

Robotic Instrumentation R&D Intern | Medtronic | North Haven, CT Jun 2025 – Aug 2025

- Conducted mechanical testing on cable and pulley systems to assess durability and inform design for reliability
- Contributed to two invention disclosures through concept development and prototype testing
- Authored a technical abstract on pulley design for the MDT Science & Technology Conference
- Supported development of an automated visual inspection system to identify post-assembly cable damage

Manufacturing Automation Intern | Medtronic | Minneapolis, MN Jun 2024 – Aug 2024

- Compiled requirements, developed tests, and conducted VOC interviews for automation project equipment, ensuring quality and business needs
- Contributed to new standards for equipment documentation and enabled timeline for over \$1.5M in programmatic savings
- Prototyped a medical adhesive dispense station and designed/fabricated adapters and holders for lab and manufacturing feasibility

Data Analyst Intern | ConocoPhillips | Houston, TX Jul 2023 – Aug 2023

- Investigated 1000+ failing records with the GEP team to streamline data preparation
- Solved data transfer issues in Snowflake, GEP, and SAP to ensure reliability for reporting
- Ran 170 daily automated tests of data warehouses
- Developed 20 automated SQL tests with 130+ steps in Microsoft Access

LEADERSHIP

Project Manager | Medical Robotics Club | Atlanta, GA Sep 2022 – Present

- Lead a team of 30+ engineers to design medical devices aimed at assisting third-party organizations
- Designing an MRI-compatible multiprocedural robotic platform in collaboration with the BM2 lab, Georgia Tech
- Designed a soft robotics platform for supporting and constraining patient's head during procedures
- Developed a light attachment for an ultrasound scalar using Fusion 360 and 3D printing

Vice Director | GT MedTech Hackathon | Atlanta, GA Jul 2023 – May 2025

- Organized an annual medical devices hackathon for 150+ participants to create real-world healthcare solutions
- Led a team of 20+ students to manage training sessions, industry events, and build weekend logistics
- Delivered training sessions on Arduino, sensors, soldering, SolidWorks, and 3D printing

Team Lead | Grand Challenges LLC | Atlanta, GA Aug 2022 – May 2023

- Developed a prototype that reduced heat loss in old apartment buildings by 49.8 percent
- Conducted experiments measuring the thermal properties of our idea in a sample environment
- Led a team of four: facilitated discussions, balanced workloads, and led meetings
- Arranged interviews with 15+ stakeholders including building owners, architects, professors