Matthew Carey

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Education

Tufts University Medford, Massachusetts
Bachelor of Science in Engineering Physics & Computer Science *Sept 2021 - May 2025*
Pre-medical Track

- **GPA:** 3.75
- **Honors:** Dean's List all semesters, Magna Cum Laude
- **Relevant Coursework:** Machine Learning, Algorithms, Machine Structure & Assembly Language Programming, Computational Systems Biology, Robotics & Mechatronics, Organic Chemistry, Genetics, Biochemistry, Biostatistics

Work Experience

- **Irradia Solutions:** Machine Learning Intern *May 2024 - September 2024*
  Summer Internship at MIT Nuclear Technology & Materials spin-out (in stealth)
  - Developed a machine learning model using historical PWR and CANDU data to optimize fuel loading and shuffling patterns for more efficient reactor burnup in a materials irradiation reactor.
  - Assisted in developing a prediction model to estimate changes in the physical and mechanical properties of materials over time under neutron irradiation, utilizing the KP, NRT, and ARC DPA models.

- **OPT Industries:** Engineering Intern / Weekend Operations Manager *June 2023 - October 2023*
  Summer Internship and continued employment at additive manufacturing startup
  - Expanded production capacity by assembling and preparing network connections for new printers.
  - Collaborated with the team of engineers to build new printers.
  - Recruited, trained, and managed a team of students to conduct weekend operations and engineering tasks.

- **Nolop Makerspace:** Staff Member *September 2023 - May 2025*
  Assisting in running the primary engineering makerspace on campus
  - Answered questions from students on CAD design, laser cutting, soldering, and other tools used for their projects.
  - Attained comprehensive familiarity with fabrication equipment of the makerspace through ongoing maintenance.
  - Taught workshops where students learned how to use the various tools of the makerspace.

Projects

- **OncoRx:** Machine learning model to predict response to oncological drugs based on genetic expression data. [Github Link] .
- **Bet Bot:** Machine learning model to predict the outcome of NBA games. [Github Link]
- **Chegg Bot:** Discord bot that visits URLs sent by users and returns an image of the page, avoiding paywalls. [Github Link]
- **Robotics, various:** Portfolio and code available through [Github Link].
- **Motorized Couch:** Motorized a sofa using the engine of a lawnmower.

Lab Experience

- **Kaplan Lab:** Assistant Researcher *January 2022 - May 2025*
  Researching the of use bioelectric networks to control morphological structure for regeneration and cancer treatment
  - Performed surgical procedures on mice, ensuring proper preparation for study.
  - Designed and implemented a procedure to study the impact of mechanical load on digit regeneration.
  - Work being applied to improve upon a wearable device to stimulate regeneration in an amputated digit.

- **Silklab:** Assistant Researcher *September 2021 - December 2021*
  Researching the applications of silk as a component in electronics
  - Conducted experiments to determine the electrical conductivity and mechanical strength of silk fibers, and analyzed the results to identify their potential as a component in transistors.
  - Work being applied in the development of new, high-performance, and sustainable electronics for various applications, including wearable technology and bio-compatible devices.

Skills

- **Programming Languages:** C, Python, C++, Java, Scheme, SML, JavaScript, x64 Assembly, LATEX, Bash, SQL
- **Languages:** English, Spanish
- **Software:** AWS, Git, Numpy, Tensorflow, Pytorch, Scikit-learn, Pandas, Solidworks, Docker, Matplotlib, Kicad, Excel
- **Databases:** PostgreSQL, MongoDB, Redis
- **Fabrication:** CNC Router, Laser Cutter, Welder, Solder

Activites

- **Track & Field:** Thrower on the Tufts Men's Track and Field team since 2021, competing at a divisional level.
- **Electric Racing Club:** Worked with a team of students to build an electric vehicle to compete against other teams.
- **Society of Physics Students:** Student run club promoting physics education and fostering a community of like-minded individuals at Tufts.