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
- **MCAT:** 517 (top 5 percentile)
- **Honors:** Magna Cum Laude, Dean's List all semesters
- **Relevant Coursework:** Machine Learning, Algorithms, Machine Structure & Assembly Language Programming, Computational Systems Biology, Robotics & Mechatronics, Organic Chemistry, Genetics, Biochemistry, Biostatistics

Work Experience

Research Experience

- **NYU Langone Health:** Research Assistant *August 2025 - Present*
  Developing improved methods for mass spectrometry database matching
  - Developed and optimized peak-matching algorithm to enable scalable spectral database searches.
  - Building an ML model to normalize spectra across collision energies for improved cross-instrument compatibility.
  - Supporting a forthcoming publication on enhanced similarity scoring for database matching.
- **Tufts Nanofabrication Lab:** Lab Assistant *May 2025 - August 2025*
  Supported lab setup, equipment installation, and documentation during facility relocation
  - Helped plan and set up the nanofabrication lab, including equipment installation and coordination with service engineers.
  - Wrote standard operating procedures for lab instruments to support safe and consistent operation.
- **Kaplan Lab:** Undergraduate Research Assistant *January 2022 - May 2025*
  Researching the use of 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.

Clinical Experience

- **Boston Sports Medicine & Research Institute:** Clinical Research Assistant *September 2025 - Present*
  Researching patient outcomes for novel ACL revision techniques
  - Conducted structured telephone interviews with post-operative patients to assess surgical outcomes and quality of life.
  - Documented patient responses, ensuring data accuracy and completeness for analysis.
- **RWJ Barnabas Hospital:** Medical Scribe – Per Diem *June 2025 - Present*
  Documented patient visits and supported physicians in a high-volume emergency room setting
  - Streamlined EMR documentation to help providers manage high patient volumes efficiently.
  - Gained hands-on exposure to a wide range of acute medical conditions and emergency protocols.
  - Ensured accurate and HIPAA-compliant charts under time-sensitive emergency care conditions.

Engineering Experience

- **Nolop Makerspace:** Staff Member *September 2023 – May 2025*
  Provided administrative and operational support for the primary engineering makerspace on campus
  - Provided technical guidance on fabrication equipment including CNC routers, laser cutters, and 3D printers.
  - Trained students on safe equipment operation and troubleshooting across various manufacturing processes.
  - Maintained equipment readiness and coordinated workshop sessions on fabrication techniques.
- **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.

Projects

- **BrainFM:** Transformer-based foundation model to predict perturbations from multi-neuron electrophysiological recordings.[Github Link]
- **OncoRx:** Machine learning model to predict cell response to oncological drugs based on genetic expression data. [Github Link] .
- **Bet Bot:** Machine learning model to predict NBA outcomes, achieving 70% accuracy in 2020s seasons.[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].

Skills

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

Activites

- **Varsity Track & Field:** Thrower on the Tufts Varsity 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:** Club promoting physics education and community among physics students at Tufts.