Atul Phadke

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Co-op availability*: Jan - June 2026*

Education

Northeastern University – Khoury College of Computer Sciences *Expected May 2028 | Boston, MA*

Candidate for *Bachelor of Science in Computer Science & Behavioral Neuroscience;* GPA: 3.75/4.0

Coursework: Fundamentals of Computer Science, Discrete Structures, Programming in C++, Program Design and Implementation, Organic Chemistry, General Biology II

Skills

Languages: Python, C/C++, JavaScript, SQL, Swift, MATLAB

Web: Flask, Node.js/Express, REST, Auth, AWS ElasticBeanstalk, ElectronJS, Wix Velo, HTML/CSS

Data/ML: PyTorch, TensorFlow, scikit-learn, numpy, pandas, cython

Tools: Git, Git Bash, LaTeX, MongoDB

Wet Lab: PCR, qPCR, bacteria culturing

Experience

Mass General Hospital – *Gene and Cell Therapy Institute* *May 2024 – Aug 2025 | Boston, MA*

Software Engineer Intern

- Engineered CAP-GENIE analysis suite across CLI, web, and desktop platforms using Python, C++, Electron, JavaScript, Flask, and AWS (EC2, S3, CloudWatch), implementing Cython-optimized sequence parsing, multithreaded C++ modules with OpenMP capable of processing over 2M reads/sec, reducing runtime by 40%.
- Developed an AI/ML protein motif analysis system using PyTorch and Scikit-learn, integrating ESM2/ProtBERT embeddings, HDBSCAN/UMAP clustering, and Random Forest models, achieving 95% accurate retrieval of functionally relevant motifs.

Northeastern University – *Center for Translational Neuroimaging* *Feb 2021 – Mar 2024 | Boston, MA*

Software Engineer Intern

- Led development of end-to-end neuroimaging pipelines for DTI, fMRI, and QUTE-CE analysis using Python, C++, Bash, and MATLAB, improving processing throughput and read accuracy of the flagship by 92%.
- Co-created CTNI cloud-based web application with Flask and AWS, supporting visualization, preprocessing, image analysis, and postprocessing workflows, reducing processing time by 35%.
- Implemented a novel AI-driven method for Blood-Brain Barrier permeability quantification using QUTE-CE MRI, integrating C++ and Python for image reconstruction and segmentation.

Projects

Admission Forge – *Developer* *May 2024 – July 2024*

- Built web platform to host admissions data for 50+ universities using ML-based data collection with Python's BeautifulSoup, integrating APIs within the Wix framework to support interactive querying.

Internship Select – *Developer* *Nov 2024 – Dec 2024*

- Constructed an AI-powered internship and job aggregation platform for college students in tech, scraping and indexing 500+ active postings using Python and Flask with asynchronous pipelines for scalable data ingestion.
- Optimized API performance with caching and efficient query handling, achieving <200ms average response time for user requests across 500+ internship listings.

Manuscripts in Preparation

1. CAP-GENIE: An open-source tool for analyzing sequencing data from AAV vector selections and screens. *Atul Phadke, Killian S. Hanlon, Casey A. Maguire*
2. A blood-brain barrier-penetrating AAV evolved in non-human primates transduces perfused human brain lobectomies. *Adam V. Crain, Atul Phadke, Killian S. Hanlon, Pedro Cruz, Kristopher T. Kahle, R. Marc Richardson, et al.*