BRIAN CHEN

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EDUCATION

Columbia University, *New York City, NY* **Expected Graduation: May 2025**

- **Majors: Computer Science** (B.A.); **Physics** (B.A.); **GPA**: 3.9/4.0; **Dean's List**, all semesters
- **Relevant Coursework:** Machine Learning, Natural Language Processing, Unsupervised Learning, Deep Learning, Analysis of Algorithms, Data Structures, CS Theory, Linear Algebra, Statistics & Probability, Multivariable Calculus
- **Teaching:** TA for COMS4771: rigorous, graduate-level introduction to Machine Learning. Topics from statistical ML, unsupervised learning, dimension reduction, convex optimization, regression, etc. Previously TA for Multivariable Calculus, Mechanics, Electricity & Magnetism. Teaching effectiveness rated 4.67/5 from anonymous student reviewers.

WORK & RESEARCH EXPERIENCE

Oleria Security **May 2024 – August 2024**
ML Intern, AI/ML Team *Bellevue, WA*

- R&D, prompt engineering, and quality testing for AccessGPT, a novel natural language security-oriented GPT
- Improved accuracy of GPT output and named entity recognition by 300% via security-specific training, standardizing database schema for consistency across all use cases, creating guardrails to prevent exposure of sensitive data
- Implemented quality-of-service tests for continuous monitoring of AccessGPT performance, metrics visualized on Datadog
- Transitioned AccessGPT services to AWS scheduled tasks with Pulumi IAC to automate retraining, enabled monthly savings in AWS infrastructure and Docker costs
- Led department research on LLM debugging, tool usage, and API interaction capabilities via practical experimentation and literature review on API design, model selection, and prompting strategies
- Brought AccessGPT from a limited scope proof of concept to alpha release; demoed live at BlackHat security conference

Prof. Nakul Verma Research Lab **May 2024 – Present**
Theoretical ML Researcher *New York, NY*

- Developing a first-of-its-kind deep learning approach to locality-sensitive metric learning; preprint available on request
- Designing a loss function that incorporates t-SNE inspired divergences within a contrastive loss network to perform dimension reduction while simultaneously maintaining a parametric embedding function
- Independently performing literature review, algorithm design, and benchmarking

Lawrence Livermore National Laboratory **May 2023 – August 2023**
Research Intern, Materials Science Division *Livermore, CA*

- Data analysis, signal & image processing in Python and MATLAB to optimize laser drilling process; published in APL
- Developed 10x more efficient data processing codes to automate drill hole detection across thousands of image frames
- Designed custom regression algorithms and analysis of variance tests for hypothesis testing

Laboratory for Functional Optical Imaging, Columbia University **May 2022 – August 2022**
Research Intern *New York, NY*

- Software development to automate implementation of 30% faster cameras for light-sheet microscopy systems.
- Connected camera API with in-house image processing software for 2x more efficient data collection
- Improved optical alignment and microscope resolution via component design and 3D printing

SELECTED PUBLICATIONS & TECHNICAL WRITING

B. Chen, Y. Shen, A. Yang, and K. Zhang. *Distance Matrix Embeddability Constraints and a Gaussian Noise Corruption Reversal Algorithm.* COMS4774 Unsupervised Learning Final Project, 2024. [paper] [poster]

S. Gorgannejad, A. A. Martin, and **B. Chen** et. al. *In situ x-ray imaging to understand subsurface behavior during continuous wave laser drilling.* In *Applied Physics Letters*, 2024. doi.org/10.1063/5.0207380. [paper]

SKILLS

Coding languages: Java, Python, C++/C, Typescript, HTML/CSS, MATLAB, Visual Basic, Markdown, C#.
Tools/Frameworks: AWS, Anthropic Claude API, spaCy, Git and Github, Pulumi IAC, PyTorch, sklearn, Datadog, Docker, Google Cloud, OpenCV.
Languages: Fluent in English, Mandarin.