# Anand Advani

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## Education

**Brown University**, Providence, RI – Applied Math–Computer Science Sc.B. *Graduating May 2026*

- Relevant Coursework: Deep Learning, Statistical Learning Theory, Computational Probability and Statistics, Algorithms

**Thomas Jefferson High School for Science and Technology**, Alexandria, VA *August 2018 - June 2022*

- GPA: 4.53/4.0, SAT: 1590/1600

## Skills

**Natural languages -** English (native), Classical Latin (fluent), Spanish (reading), Russian, Japanese (beginner)
**Programming languages -** Python (most), C/C++, MATLAB, R, OCaml, Java, HTML/CSS, Go, Lean, JavaScript, Julia (least)
**AI and web technologies** - AWS (EC2/S3), PostgreSQL, Flask, Bootstrap, React.JS, Node.JS, Langchain + OpenAI APIs, pytorch, tensorflow

## Work Experience

**Brown University Data Science Institute,** Head Undergraduate Teaching Assistant *September 2023 - Present*

- For Computational Probability and Statistics, a class in Markov Chain Monte Carlo methods, importance sampling, Gibbs sampling, and generative modeling, organized office hours, grading, administration of a >150-person class

**Docunexus (LLM startup)**, Technical Intern *June 2023 - August 2023*

- Automated workflows to create more cohesive LLM-based applications, using langchain

**VocaliD (artificial voice startup)**, Speech Processing Intern *June 2021 - August 2021*

- Helped improve speech synthesis model by making it more "conversational" using Python for language modeling and web scraping. Researched phonetic processes that occur in rapid speech

**Bauhealth (health tech startup),** Natural Language Processing Intern *June 2021 - August 2021*

- Devised a named-entity recognition model using spaCy for ICU notes (a system that finds and classifies the contexts of general search terms from a database of physicians' notes). Research project with national COVID-19 data set.

## Research Projects

**Autodifferentiation versus Finite Difference Approximations for Machine Learning** *February 2025 - August 2025*

- Experimented using physics-informed neural networks (PINNs), finite difference schemes, and various hybrid methods to approximate solutions to partial differential equations, and analyzed convergence properties of each method
- Presented a poster at the Brown Applied Math Directed Reading Program Poster Session

**Simulation Environment for a Brain-Computer Interface** *June 2024 - Present*

- Research assistant in the BrainGate collaboration, the oldest and largest human brain-computer interface clinical trial
- Improved methods using time series neural data for control of a computer cursor by a patient with tetraplegia (paralysis) via an intracortical brain-computer interface. Used Kalman filter variants and variational autoencoders
- Constructed a simulation cursor-control system using eyetracking from a laptop webcam with OpenCV
- Presented a poster at the Brown Undergraduate Teaching and Research Award Symposium

**"ChatGPT Did Not Write This Title": Detecting LLM Outputs** *April 2023 - May 2023*

- Project detecting whether academic text was authored by a human or by an LLM
- Achieved 70%+ accuracy with fine-tuned HuggingFace transformers (DistilBert) in TensorFlow

**"Terry, Go To Jupiter": Speech Recognition Control of a Planetarium** *September 2021 - May 2022*

- Developed speech recognition system for SkySkan planetaria using Kaldi
- Poster presentation and conference-wide demo at the 2022 Middle Atlantic Planetarium Society Conference

## Leadership and Volunteering

**AI and Robotics Ethics Society @ Brown, Co-President** *September 2025 - Present*

- Managed a 300-person club with 30+ regular attendees, organizing panels, meetings, socials, and other events
- In collaboration with faculty at the University of Bonn, led a 9-person research group in a mechanistic interpretability project about multilingual LLMs

**Society for Industrial and Applied Mathematics, Brown University Chapter,** Treasurer *September 2023 - May 2024*

- Oversaw budget of >$1500 over 9 events and event series serving 75+ distinct attendees
- Organized events such as an interdepartmental Trivia Night and graduate student talks

**Connecting Communities to Technology (501(c)(3) Nonprofit)**, Director of Python *April 2020 - August 2021*

- Organized team of four teachers and designed curricula from scratch for three levels of Python programming classes
- Taught all three courses for free to students from 5 countries online during COVID