

Tarun Bandi

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EDUCATION

Carnegie Mellon University

Bachelor of Science in Computer Science and Mathematics

GPA: 3.95/4.00

Relevant Coursework: Theory of Computation, Data Structures and Algorithms, Constructive Logic, Functional Programming, Probability, Systems Programming, Parallel Algorithms

Pittsburgh, PA

May 2025

EXPERIENCE

Undergraduate Research Assistant

Carnegie Mellon University

May 2023 – Present

Pittsburgh, PA

- Worked on the design of a failure detection system for an artificial lung design project
- Designed a zero-shot reinforcement learning algorithm with **70%** accuracy that compares data and forecasts
- Wrote and deployed a Go application via AWS EC2 and Unix commands that publishes information to InfluxDB
- Deployed a Grafana Application via Docker to connect to InfluxDB and display the information.
- Resolved Merge conflicts, issued triage to the system during times of failure, and documented code thoroughly

Teaching Assistant for 15-251(Great ideas in theoretical Computer Science)

Carnegie Mellon University

December 2023 – Present

Pittsburgh, PA

- Teaching assistant for a class of **200+** students
- Leading recitations of **20+** students on paradigms in CS, such as P vs NP, Graph Theory, and the Halting problem
- Led biweekly office hours to address student questions and concerns related to course material or grading
- Served as a mentor to students, meeting with students one-on-one to discuss performance and concerns privately

PROJECTS

SQL Database | *C, SQL, GDB, Unit Testing*

- Designed and implemented a database system using C
- Built a system that transfers data between memory and disk efficiently, using **B-trees** and **buffer pools**.
- Created a tokenizer, parser, and code generator from text to bytecode
- Thoroughly tested code using testing frameworks, and python scripting.

Deep Learning for Poker | *NumPy, Keras, TensorFlow*

- Designed and implemented a Neural network to predict pre-flop Poker moves.
- Engineered inputs to the network to be pot size, and player actions.
- Trained network on a data-set of over **100,000** hands, resulting in an **80%** accuracy in picking the best move
- Addressed bias and variance trade-off, resulting in a **25%** improvement in prediction
- Ensured modularity of model to ease future expansion in adding flop and post-flop moves

Petmoo.com Full-stack Redesign | *React, CSS, MongoDB*

- Leveraged react, lazy loading, and asynchronous loading to achieve a **30%** optimization in load times
- Migrated database to MongoDB, achieving a **50%** reduction in database error
- Integrated Stripe API for payment processing, leading to a more streamlined transaction process
- Employed caching techniques to improve the speed of the search engine

Mathematical Modeling of Respiratory Infections | *Sci-Kit Learn, Pandas, Seaborn, Matplotlib*

- Analyzed data sets related to respiratory infections using bio-informatics to identify the impact on gene expression
- Identified relevant features to mathematically model gene expression
- Utilized sci-kit learn to perform k-nearest-neighbors clustering and used seaborn/matplotlib to visualize this
- Employed hypothesis testing and confidence interval validation to analyze statistical significance of observations

Automated Sudoku Solver | *Python, CMU-Graphics*

- Designed and implemented a Sudoku Game, featuring a backtracking solver.
- Incorporated an intuitive UI, with features such as hints, adding custom boards, real-time feedback
- Highlighted the ability to document code thoroughly, and bridge algorithmic complexity with user experience.

TECHNICAL SKILLS

Languages: Java, Python, C, C++, TypeScript, SQL, HTML, CSS

Frameworks: React, AWS (EC2, S3, Lambda), TensorFlow, Keras, PyTorch

Developer Tools: Docker, Kubernetes, Git

Libraries: pandas, NumPy, Matplotlib, Seaborn