BRANDON GONG

https://github.com/brandon-gong · (901) 414-6057 · brandon_gong@brown.edu

Education & Coursework

Brown University (2021 - 2025):

- Introduction to Software Engineering (CSCI0320): software development lifecycle, agile methodology, SCRUM, Git, profilers, debuggers, relational databases, concurrency techniques, testing, continuous integration, teamwork-based projects in Java. **Grade: in progress**
- Accelerated Introduction to Computer Science (CSCI0190): data structures, algorithms, computational complexity, functional programming, unit & integration testing. **Grade: A**
- Honors Linear Algebra (MATH0540): proof writing, vector spaces, linear transformations, inner products, solving linear systems, Hermitian, orthogonal matrices, dual spaces. **Grade: A**
- Honors Calculus (MATH0350): vector analysis, multiple integration, partial differentiation, line integrals, Green's theorem, Stokes' theorem, the divergence theorem, differential forms. **Grade: A**
- Honors Statistical Inference I (APMA1655): probability spaces, discrete and continuous random variables, methods for parameter estimation, confidence intervals, and hypothesis testing. **Grade: in progress**

Collierville High School (2017-2021):

- Class rank: 1 / 690
- GPA: 4.783 / 4
- SAT / ACT: 1560 / 36
- AP Chemistry, AP Physics: 5 / 5
- SAT II Microbiology: 800/800
- 2020 American Invitational Mathematics Examination: 6 (top 2.5% of national AMC participants)
- Java 8 Certified Associate (2017)
- 2021 Tennessee Science Bowl Champion (Specialized in biology)
- 2021 National Science Bowl: #26 / 796

Technical & Soft Skills

Languages: Python, Java, Frontend (HTML/CSS/JS), Rust, C++, Scheme, Pyret
Technologies: Linux (5+ years of using Linux on personal laptop), numpy/scipy/matplotlib, PyTorch, Tensorflow, React (web), React Native (iOS/Android development), Bootstrap, Git/GitHub, Firebase, OpenCV, Make, Maven, bash scripting, Express.js, Node.js

Soft Skills: Fast learner (of new languages, frameworks, concepts, etc), writing & documenting, mathematical problem-solving, teamwork/communication, adaptability, strong motivation to exceed expectations, organizational skills

Personal Projects

- **Neuroevolution-based Checkers Engine**
  Language: Rust, Python for data visualization
  Concepts: Machine learning, artificial neural networks, genetic algorithms, decision theory, parallel computing, data mining, data visualization
  Description: Evolving a population of neural networks from scratch to play checkers. Each generation has a large number of individuals, each of which has a unique genome encoding a different neural network structure. Strongest networks are more likely to pass genes on to the next generation. Large amounts of data is collected on self-play games (thousands of games played per generation), and analyzed using python scripts to monitor progress, optimize mutation rates / population sizes, and visualize self-play Elo over time.
- **CHS Math Bowl**
  Language: HTML, CSS, JavaScript
  Concepts: Non-relational databases, realtime data collection + monitoring, data mining, user authentication, frontend design
  Description: Tournament manager for Collierville High School's Math Bowl. Provided timers & scorekeeping app across multiple rooms; data from each room collected in real-time into a centralized database for automated team rank calculation and for displaying information to spectators in auditorium. Provides to admin team analytics on question difficulty, team performance, round progress.
- **web2anki**
  Language: Python
  Concepts: XML parsing, data scraping, cleaning/reformatting data from public resources
  Description: Smaller project built to aid in studying for science bowl. Transform HTML, CSV table data from online (i.e. Wikipedia, Quizlet flashcards) into Anki deck format for studying. Flexibly accommodate inconsistent data formats from public sources/websites, and enable Anki flashcards to be formatted in any format desired

Team Projects

- **Student Recommender System**
  Language: Java
  Concepts: K-nearest neighbors clustering, similarity search of text documents via Bloom Filter similarity metrics, CSV parsing, data aggregation from multiple sources (files, databases, APIs)

Description: Match compatible students to work on group projects together based on similar interests, years of experience, strengths and weaknesses, etc. Combine quantitative and qualitative data from multiple sources into unified KD tree data structure for k-nearest-neighbor recommendations. Resilient extraction of CSV data (with errors, inconsistencies, etc). Exposing a scriptable, extensible REPL interface to the user.

- **Brown Critical Review**
  Language: JavaScript, shell script, SQL, Embedded Javascript Template
  Concepts: Automated email system, relational MySQL database, data visualization with D3.js, REST API development with Express.js
  Description: Critical Review is Brown's version of Rate My Professor. Compile student reviews, create visualizations using D3.js to show time commitment, proportion of class in a certain grade, etc. Build RESTful API endpoints to handle account creation, password reset, course display, signin/authentication, adding new editions, viewing staff, etc. Write SQL scripts for database reformatting, data requests.

Work Experience

Programming lead, CHS FRC Robotics Team 5002 (2017-2019)

- Coordinated with build, media, and design teams to set and meet schedules for programming and testing, financial team for needed sensors & equipment
- Introduced Git / source control, modular programming; performed code review, trained new team members, worked with CAD team to run simulations / test code

Code Sensei, Code Ninjas Collierville (2020-2021)

- Designed (based on time constraints, budget) and led two camps teaching young kids (ages 5-13) block programming and introductory JavaScript