Brandon Gong

brandon.gong@brandongong.org · (901) 414-6057 · www.brandongong.org

Education

School: Collierville High School, Collierville, TN
Class Rank: 1/~700
Weighted, UW GPA: 4.7381, 4.0
ACT: 36 (all subscores)
SAT: 1560 (760 Reading, 800 Math)
Relevant Coursework: AP Computer Science A (exam-only, 9th grade, scored 5); AP Calculus BC (10th grade, scored 5), Dual Enrollment Calculus III; Dual Enrollment Introduction to Differential Equations; Dual Enrollment Linear Algebra and Introduction to Proof.

Activities

Lead Programmer (2018-2020) – FRC Team 5002, VEX Team 87528A. 15 hr/wk, 25 wk/yr.
During first year of robotics (2017), assisted then-lead programmer with translating entire codebase to Python for improved unit testing, rapid prototyping, and ease of access. As lead programmer, continued with Python & introduced ideas of modularity (mix-and-match code for different subsystems) and encouraged extensive use of state machines. Trained new team members, teaching basic Python, how to test code, and source control with Git, forking, and pull requests. First lead programmer to get vision processing working on coprocessor as well as implement socket-based comms between Arduino & main computer for LED strip light control. Coordinated with build/media/CAD teams on sensor placement and mechanism design. Assigned tasks to team members (~5 members) based on ability, set deadlines for completion and testing.

Vice President (2019-2020) – CHS Coding Club. 2 hr/wk, 30 wk/yr.
In order to make club open to even those new to coding, divided club into two groups (beginner and intermediate). Taught intermediate group (grades 9-12, ~10 students) introductory JavaScript and basic algorithms using p5.js. Created presentations to keep club members updated, teach basic concepts and jargon, and show what's possible with code. Made weekly plans with President. Coordinated prizes & gifts to incentivize learning and friendly competition. Managed budget (fund collection, purchase of snacks and t-shirts).

Robotics Mentor (2017-2019) – FTC Team 10034. 10 hr/wk, 10 wk/yr.
Introduced middle school robotics students to code (block first, then Java). Gave advice to build team on feasibility of designs as well as needed sensor. Taught programming students how to wire up motors and sensor components. Fixed errors that were blocking progress, helped code and go over difficult mechanisms (e.g. mecanum drive train).

Code Sensei (2020) – Code Ninjas Collierville. 12 hr/wk, 25 wk/yr.
Paid work – helped elementary-middle school kids (age 5-12) learn how to code through developing games with JavaScript. Interacted with the students to keep them excited about coming in and learning code. Designed and executed two summer camps (robotics: 2 sessions, drone programming: 3 sessions), ~15-20 young students per camp, according to COVID safety protocols. As head instructor of these two camps, coordinated with two assistant Senseis to ensure all kids were engaged in a safe and socially distant manner. Graded and provided constructive feedback for student work. Sanitized desks and laptops.

Technology Lead (2017-2020) – CHS Math Team. 3 hr/wk, 36 wk/yr.
Designed & developed tournament management software for CHS Math Bowl (~4000 LOC). Included real-time database, user authentication, score validation. Trained ~20

volunteers on how to use the software. Tutored math students one-on-one (Calculus AB & BC and lower, ~1 hr/wk). Placed top 10 in the state for TMTA advanced topics; at Mu Alpha Theta National Convention, placed 31st Mu BC Calculus & 26th Mu Applications. Prepared for the first time for AMC math contest in 11th grade; scored 91.5 on 2020 AMC A, 90.0 on 2020 AMC B. Scored 6 on 2020 AIME I.

Captain (2019-2020) – CHS Physics Olympiad. 4 hr/wk, 16 wk/yr.

Co-founder of club, scheduled and led weekly study sessions with club members and physics teacher. Went over solutions with members, created study materials (flashcards, formula sheets) to prepare from. Collected fees to pay for exam, registered Collierville High School with USAPhO, and ordered exams.

Personal Blog (2020) – brandongong.org/thinking. 3 hr/wk, 5 wk/yr.

Starting during COVID-19 quarantine in the summer of 2020 because I wanted to share interesting math/computer science tidbits I find online with others, particularly those that fascinate me but aren't covered in school (e.g. Hilbert curves, Feynman integration). Use it also as an ability to strengthen my understanding in the material and develop my skills. Also write about other things that I am passionate about (e.g. piano). Temporarily on hold while I write college essays.

Other Activities/Recognitions

Java 8 OCA Certification (9th grade, 97%)
Germantown Youth Symphony Orchestra (2018-2020, 3rd chair violin)
CHS Varsity Tennis Squad (2017-2020, 3rd seed)
Member of National Honor Society, Science National Honor Society, Rho Kappa
Collierville Environmental Commission – Environmental Excellence Award winner (2020)
National Merit Semifinalist

Selected Works

CHS Math Bowl

Tournament manager software written for CHS Math Bowl. Automatically assigned matches to rooms each round, provided scoreboard and timer display for each room, updated scores on auditorium projector live. Could handle disputes & disqualifications. Performed rank calculation based on two-pass sorting algorithm (total matches won then total points).

CRIS

iOS & Android app for making composting more accessible. Used Google Cloud APIs to analyze images of food scraps as well as a fuzzy, typo- and synonym-aware search algorithm to provide custom advice on composting particular food scraps. Also provided a feed of curated environmental-friendliness articles. Developed with CHS Upcycle Club.

Web2Anki

Python script to convert Quizlet decks + Wikipedia tables to Anki flashcard decks, developed out of necessity for a tool like this while studying for Science Bowl. With Wikipedia tables, supported flexible layout (picking columns, putting data from multiple columns on same card face, etc.).

processing-sketches

My personal hobby! I highly enjoy making generative art whenever I have an hour or two to spare. Written in Java Processing, my sketches explore randomness, order, procedural generation, geometry, and colors.

More of my work can be found on GitHub (github.com/brandon-gong).