ARMAAN GOMES

Student, Roboticist, Martial Artist,
Friend, Teacher, Developer, Researcher
Scientist, Engineer, Writer

PERSONAL PROFILE

I'm Armaan, a high school student interested in CS, EE , and Robotics. I enjoy solving problems and using computers to automate tasks for me. My favorite application of CS is soft computing—finding approximate answers to complex problems through heuristics and evolutionary algorithms. Also signal processing is amazing!

CONTACT ME

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EDUCATION

Homestead High School ------------------------------------- 2021 - Present

President of Cybersecurity Club, Programming Club. Science Bowl VP,President. Robotics Officer. Also, peer tutor and green and white award recipient. Coursework includes: AP CS A , AP Physics 1, AP Calculus BC, American Literature Honors, AP US History, AP Physics C Mechanics.

SAT: 1590 Math: 800 Reading/Writing: 790

BWSI: BASICs of ASICS, MIT Lincoln Labs--------------------- 2024 - 2024

Learned to design ASICs (chips) and worked with 6 friends to design SuperMic, an 8-channel variable delay-and sum beamformer. Additionally I designed and tapedout 7 other ASICs on my own.

RESEARCH

Metaheuristic Firebreak Optimization ----------------------- 2022 - 2023

Shocked by the devastation of the 2020 California Wildfire season, I worked with my colleague Samuel Yuan to optimize firebreaks through metaheuristic techniques. We summarized our work in the project Leveraging Genetic Algorithms and Mathematical Wildfire Propagation Models to Determine Optimal Firebreak Placement. Our project won first place at both Synopsys Championship and CSEF, as well as multiple sponsored awards such as the Math Teacher's Achievement Award for Computational Systems and Analysis and the IBM Award.

clEar: Beamforming Glasses-based Hearing Aids----------- 2023 - Present

After dealing with hearing loss within my family, I decided to search for ways to improve hearing aids. Hearing aids lack directionality, making it very difficult for those with hearing loss to understand speech in noisy rooms. clEar is a new type of hearing aid that uses an array of microphones to isolate speakers in noise environment and an algorithm I made to maintain the user's situational awareness. I presented my work at the regional, state , and international science fair, and earned 3rd in my category internationally among other awards. More information relating to my work can be found here. I plan to publish a paper on my work and apply for a provisional patent

18-Channel High Speed Potentiostat------------------------ 2024 - Present

Working with the UC Berkley Nanotechnology Lab, I have been building an 18-channel potentiostat for high throughput blood testing and chemical analysis. The sensing side depends on microfluidic cartridges and CNTs. I am focusing on overcoming hardware speed and data transfer challenges with new hardware.

FRC Team 670 Pit Boss and Tech Lead ----------------------- 2021 - 2024

I joined Team 670 as a freshman in 2021 and have been growing with the team since. Over my time with the team, I worked on multiple subsystems and control algorithms(including that of the robotic arm), taught new members, implemented advanced telemetry and driver information systems, and became the largest contributor to MustangLib(our homegrown library) science its inception. My work accelerated debugging and help lead to our first regional win in history and other awards including the Judges Award and Innovation in Control Award

Inobis Academy COO & CTO -------------------------------- 2022 - Present

I co-founded Inobis Academy, a 501(c)(3) non-profit, with the aim of offering quality tutoring to all students at no cost. Over our lifetime we have had over 4000 session attendances and have impacted many countries. I tutor CS and Math for Inobis Academy, and work as a web developer and systems supervisor. 200+ hours volunteered.

PROJECTS

Open Source Ugly Ducky------------------------------------- 2023 - Present

Utilizing the Onboard grant from Hack Club, I designed a custom PCB teaching tool for Cybersecurity Club to show the capabilities of a USB Rubber Ducky and the defenses against it in a cheap package that prevents the Ugly Ducky from being used as a real-world attack vector.

Helix Hacks --- 2022

I hosted and ran Helix Hacks III, a global hackathon, with over 60 participants from across the globe with ~2.4k of prizes sponsored by industry leading companies. We hosted a multitude of workshops ranging from intro to python to high level cybersecurity and binary exploitation.

Wednesday Science --- 2021-2023

I write for Wednesday Science, a science blog dedicated to showcasing high level science concepts to students of all ages. Personally, I have written on topics from LEDs and CS to sound, in both physics and our brains, and gravity.

AWARDS

- $1000 Medici Grant (June '24)
- ISEF Third In Category, Intl. Fair (May '24)
- CSEF First in Category, State Fair (Apr. '24)
- Grand Prize - Best of Championship (Mar. '24)
- Grand Prize, Robby Beyers Innovative Solutions Award (Mar. '24)
- Andreasen Excellence in Engineering Science Award (Mar. '24)
- IBM Award, Synopsys Championship (Mar. '24)
- Kerry Veenstra Awards, Synopsys Championship (Mar. '24)
- Synopsys Championship First Place (Mar. '24)
- Arizona East Regional Winner (Mar. '24)
- Calgames 2023 Judges Award (Oct. '23)
- CSEF First Place (Apr. '23)
- Math Teacher's Achievement Award, CSEF (Apr. '23)
- FRC Dean's List semifinalist (Mar. '23)
- Synopsys Championship First Place (Mar. '23)
- IBM Award, Synopsys Championship (Mar. '23)
- PVSA Gold (Dec. '22)
- Calgames 2022 Winner (Oct. '22)
- picoCTF 2022 Top 2% Globally (Mar. '22)
- USACO Silver (Feb. '22)

LEADERSHIP

- Cybersecurity Club Founder
- Programming Club President
- Science Bowl President, Vice President
- Robotics Software Lead and Pit Boss

ADDITIONAL SKILLS

- CS abilities (Java,C/C++,Python,HTML, CSS, JS, React,Assembly x86/RISC-V, C#, R, web/game dev, ML, cybersecurity, FRC)
- Leadership and Management
- Writing (science, humanities) and Comprehension
- Communication and teamwork
- Ingenuity and perseverance
- Taekwondo (Third Degree Black Belt)
- Languages (English, Spanish, Konkani)
- Organization and Time Management
- Public Speaking