

ABHAY SHUKLA

abhayshuklavtr@gmail.com | <https://www.linkedin.com/in/shuklabhay/> | <https://github.com/shuklabhay> | <https://shuklabhay.github.io>

EXPERIENCE

FRC 604: Quixilver Robotics

Controls/Software Lead (10-11)

2022 - Present

California

- Develop team's competition data collection application, enhance robot capabilities and localization with computer vision and environmental sensors, contribute to team software (particle filter, time-optimal trajectory optimizer, yearly robot control architecture).
- Lead subteams in design, manufacturing, and programming of team robot while training new members to contribute to robot development.
- Contribute to community FRC tool TheBlueAlliance: global competition data aggregation and insight platform. Attend/host 20+ STEM community outreach events.

CA State Summer School for Mathematics & Science, UCLA

Brain-Inspired Computing Cohort Member

2024

California

- Investigated parallels of biological mechanisms to machine learning advancements (attention, visual processing, recurrent systems, reinforcement, etc).
- Developed audio generation ML architecture with UCLA funding.

Bay Area STEM Academy

Cofounder

2023 - Present

California

- Developed engaging curriculums, recruited mentors, planned and effectively taught in-person and online camps encompassing diverse STEM fields.
- Impacted 500+ students and raised \$4800+ to support organization costs, local STEM outreach initiatives, and Indian children healthcare foundation.

PROJECTS

StereoSampleGAN

GitHub Repo: <https://github.com/shuklabhay/stereo-sample-gan>

- Introduces a novel machine learning architecture to generate stereo, time-frequency representations of audio samples while optimizing computational efficiency.
- Partially funded by UCLA, paper pending publishing.

Quickscout

GitHub Organization: <https://github.com/frc604>

- Led development of flexible application to effectively capture and visualize FRC competition data.
- Trained 10+ team members in web dev to build app and adapt to yearly games. 130+ users on FRC604, data collected for 700+ robots.

Domotron

Robot Website: <https://604robotics.com/2023-2024-crescendo/>

- Developed physics-based shot calculations, driver control automation, competitive autonomous routines. Designed climber winch mechanism and robot vertical elevator.

VelocityDraft

Application Website: <https://shuklabhay.github.io/velocity-draft/>

- Open source webapp leverages user writing abilities and essay deadlines to algorithmically determine best order of essay writing. Third place project in OneHacks III Hackathon.

EDUCATION

Leland High School

Junior

4.00 UW A-G

San Jose, CA

SKILLS

Technical Fields

AI/ML, Robotics, Signal Processing, CAD, 3D Printing, Webdev/Appdev

Other

Digital Audio Production, Graphic Design, Video Editing

HONORS & AWARDS

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|---|------|
| • FRC604: World Championship Milstein Division Winner (12/3500 Internationally + 4/300 in CA) | 2024 |
| • NextFlex FlexFactor: Entrepreneurship Competition Winner (1/260 in CA) | 2024 |
| • OneHacks III Hackathon: Third Place (3/120 Internationally) | 2023 |
| • SCU/SVUDL Invitational: PF Finalist (2/140 Internationally) | 2022 |