

# ABHAY SHUKLA

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## EXPERIENCE

### FRC 604: Quixilver Robotics

Controls/Software Lead (10-11)

2023 - 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 optimization software, 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 vertical elevator.
- Ranked 4/300 California teams, 12/3500 internationally. World championship division and two time California regional event winning robot.

### 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

- NextFlex FlexFactor: Santa Clara Regional Winner
- NSE Level 2: Silver Distinction
- OneHacks III Hackathon: 3rd Place Submission

2024

2024

2023