

ABHAY SHUKLA

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EXPERIENCE

FRC 604: Quixilver Robotics

June 2022 - Present

Controls/Software Lead (10-11)

California

- Develop team's competition data collection application, contribute to team's Particle Filter, Holonomic Time Optimized Autonomous Path Planner, and Yearly Robot Control Software.
- Enhance robot capabilities and localization by utilizing computer vision and environmental sensors.
- Lead subteams in design, manufacturing, and programming of team robot while training new members to contribute to robot development. Personally attended 20+ STEM community outreach events.
- Contribute to universally used FRC tool TheBlueAlliance: a global competition data aggregation and insight platform.
- 2024 Season: 4/300 California teams, 12/3500 nationally.

UCLA COSMOS (2024 Cluster 1)

July 2022 - August 2024

AI Cohort Student

California

- Participated in highly selective 4 week UCLA Neurology and AI Summer Program (14.6% acceptance rate).
- Developed comprehensive understanding of transformers, recurrent networks, advanced regression, reinforcement learning, convolutional models, and training optimization.

Bay Area STEM Academy

April 2023 - Present

Cofounder

California

- Developed engaging curriculums, managed logistical aspects, recruited mentors, and effectively taught multiple in-person and online camps encompassing diverse STEM fields.
- Impacted 500+ students and raised \$4800+ to support organization costs, local robotics team STEM outreach initiatives, and underserved 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.
- Independent research project pending publishing, continuation of UCLA COSMOS 2024 Research.
- Takeaways: Advanced ML Training Techniques, Attention/Transformers, GANs, Signal Processing, Data Representation, Data Collection, AI Research.

Quickscout

GitHub Organization (Private Team Project): <https://github.com/frc604>

- Provides intuitive and easily modifiable data collection interfaces for effective data collection and flexible control over data capture/visualization.
- Mainly led app development, trained 10+ team members in web dev to build app in a modular to build and adapt the app to yearly games.
- Actively used by FRC604: 130+ users, data collected for 700+ robots.
- Takeaways: Modular App Design, Insightful Data Visualization, Big Data Collection and Processing, Full Stack Development, Intuitive Interface Design

Domotron (FRC604 2024 Robot)

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

- Competitive FRC robot with speaker, amplifier, and trap scoring capabilities.
- Developed physics-based shot calculations, driver control automation, competitive autonomous routines.
- Designed climber winch mechanism and vertical elevator.
- Won International World Championship Division and two California Regional Events.

VelocityDraft

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

- Leverages user writing abilities and essay deadlines to algorithmically determine best order of essay writing to maximize writing and review time and prevent overwhelming users.
- Third place project in OneHacks III Hackathon.
- Takeaways: GitHub Action Automation, Algorithmic Problem Solving, Website Interface Design

EDUCATION

Leland High School

HS Junior

Expected June 2026

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

May 2024

May 2024

August 2023