ABHAY SHUKLA

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EXPERIENCE

FRC 604: Quixilver Robotics
Controls/Software Lead (10-11)

June 2022 - Present
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)
AI Cohort Student

July 2022 - August 2024
California

· Participated in highly selective 4 week UCLA Neurology and AI Summer Program (¡4.6% acceptance rate).
· Developed comprehensive understanding of transformers, recurrent networks, advanced regression, reinforcement learning, convolutional models, and training optimization.

Bay Area STEM Academy
Cofounder

April 2023 - Present
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   *Expected June 2026*
HS Junior   *San Jose, CA*

SKILLS

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

HONORS & AWARDS

- NextFlex FlexFactor: Santa Clara Regional Winner   May 2024
- OneHacks III Hackathon: 3rd Place Submission   August 2023