ABHAY SHUKLA

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EXPERIENCE

Stanford Center for Biomedical Informatics Research November 2024 - July 2025
Gevaert Lab Student Researcher *California*

- Worked with researchers from Stanford, UPenn, and UC Davis to developed PINNs for physically constrained medical image augmentation, improving cancer detection accuracy by 4–20%.
- Implemented computer vision models (CNNs, Vision Transformers) for precise breast region segmentation, Designed Python data processing pipelines for efficient handling of large-scale biomedical datasets on multi-node systems.

FRC Team 604: Quixilver Robotics June 2022 - Present
Controls/Software Lead (10) *California*

- Implemented real-time localization and piece detection computer vision systems for three large-scale, 125lb competition robots.
- Designed and led the fabrication of numerous robot components, applying advanced techniques in both additive manufacturing (TPU, PETG, PLA 3D printing) and sheet metal construction.
- Brought the team to top 0.1% international ranking (5/3,500+ teams) in 2024.
- Developed data collection infrastructure powering 200+ users to analyze 1000+ competition matches.

UCLA COSMOS (Neurobiology and AI Cohort) July 2024 - August 2024
Student Researcher *California*

- Created a digital twin to model rodent pathfinding capabilities, accurately replicating true navigational behaviors and cell activations.
- Developed a UCLA campus image geolocation model by organizing campus-wide video data collection, creating custom artifact-free frame extraction, and using the resulting 1,500+ curated images to fine tune AlexNet.

PROJECTS

Voquel - *Algorithm Demos*

- Full stack LLM-enhanced research project for accessible audio translation with a focus on preserving rhythm, emotion, and artistic intent.
- Content translated by Voquel has reached almost 1 Million viewers over 70 different videos.
- Received Honorable Mention at the 2025 Synopsys Science Fair (top 10% out of ˜1000 competitors); recognized by the City of San Jose for language preservation efforts.

PercGAN - *Independent Research Project*

- Developed a lightweight generative network for high-fidelity stereo percussion generation presenting unique audio representation and enhanced StyleGAN architecture.
- Achieved an 85% quality improvement and 25× training-time reduction compared to WaveGAN, MelGAN, etc..

Tessera - *Landing Page*

- Developed an end-to-end conversational voice agent delivering adaptive listening exercises for auditory rehabilitation.
- Engineered context-aware LLM-managed session state, enabling personalized progression in a 30 MB application optimized for clinical deployment.

SporeStrike - *Entrepreneurship Project*

- Created aerial fungal infection treatment system with 3D-printed prototype components for targeted agricultural application.
- Won first place out of 260 teams at the 2024 FlexFactor Entrepreneurship Championships, presenting to civil and aerospace engineering panels.

EDUCATION

Leland High School *4.00 UW A-G*
Junior (Expected Graduation 2026) *San Jose, CA*

SKILLS

Technical Fields AI/ML, Data Visualization and Analysis, Robotics, Signal Processing, 3D Printing, Web Development

HONORS & AWARDS

- 2025 Synopsys Science & Engineering Fair Honorable Mention (Top 10%, 975+ Participants) 2025
- WCP CADathon/Robot Design Challenge Finalist (Top 1%, 1000+ participants) 2024
- FRC604: World Championship Milstein Division Winner (5/3500 Internationally) 2024
- OneHacks III Hackathon: Third Place (3/120 Internationally) 2023