

ABHAY SHUKLA

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

EXPERIENCE

Stanford Center for Biomedical Informatics Research <i>Gevaert Lab Student Researcher</i>	November 2024 - Present California
<ul style="list-style-type: none">Developed physics-based neural networks for anatomically accurate image augmentations (tissue compression, stages in respiratory/cardiac phases, etc), significantly improving cancer model accuracy.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 <i>Controls/Software Lead (10)</i>	June 2022 - Present California
<ul style="list-style-type: none">Implemented real-time computer vision systems for autonomous robot navigation and object detection.Designed strategic robotic mechanisms and integrated multi-modal sensors for optimal robot performance and reliability.Developed competition data collection infrastructure and visualization tools analyzing 1000+ competition matches with 200+ users.Achieved top 0.1% international ranking (12/10,000+ teams) through integrated hardware-software optimization.	
UCLA COSMOS (Neurobiology and AI Cohort) <i>Student Researcher</i>	July 2024 - August 2024 California
<ul style="list-style-type: none">Developed neural networks to model rat hippocampus activity, perform image geolocation, and recognized handwritten characters.Applied neurobiological priors to computational modeling techniques using Jax, Torch, and TensorFlow.	
Pavyl <i>Software Design Advisor</i>	January 2025 - Present California
<ul style="list-style-type: none">Evaluated memory and computational efficiency of infinite context large language models.Recommended app optimizations for model accuracy, external tool integration, and response time.	

PROJECTS

StereoSampleGAN - <u>Independent Research Project</u>
<ul style="list-style-type: none">Developed pioneering generative adversarial network addressing critical research gaps in high-quality stereo audio synthesis.Implemented efficient image-like audio representations and efficient model training techniques.Achieved 85% quality improvement and 25x training time reduction compared to industry benchmarksSkills: Time-Series Data, Multimodality, PyTorch, NumPy, DSP
Vox Transforms - <u>Science Fair Research Project</u>
<ul style="list-style-type: none">Developed LLM-based multimodal musical translation system preserving rhythmic, melodic, and artistic features of sung audio.Won Honorable Mention Award out of 977 participants at 2025 Santa Clara Synopsys Science Fair.Project presented to San Jose Mayor Matt Mahan and recognized by the City of San Jose for impact on local language preservation.Skills: Model Ensembling, LLM Manipulation, Signal Processing, Model Context Protocol
SporeStrike - <u>Entrepreneurship Project</u>
<ul style="list-style-type: none">Designed computational models for drone-based fungal infection treatment system, created prototype 3D printed components.Presented project to civil and aerospace engineering panel; won first place/260 competitors at 2024 FlexFactor Entrepreneurship Championships.Skills: Real-World System Design, CAD, 3D Printing

EDUCATION

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

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

• 2025 Synopsys Science Fair Honorable Mention (Top 10%, 975+ Participants)	2024
• WCP CADathon/Robot Design Challenge Finalist (Top 1%, 1000+ participants)	2024
• FRC604: World Championship Milstein Division Winner (12/3500 Internationally, 4/300 in CA)	2024
• OneHacks III Hackathon: Third Place (3/120 Internationally)	2023