

# ABHAY SHUKLA

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## EXPERIENCE

<b>Stanford Center for Biomedical Informatics Research</b> <i>Gevaert Lab Student Researcher</i>	November 2024 - Present California
<ul style="list-style-type: none"><li>Implemented computer vision models (CNNs, Vision Transformers) for breast cancer region segmentation in medical imaging.</li><li>Developed physics-inspired neural networks to correct systematic breast compression error during breast medical imaging.</li><li>Designed Python data processing pipelines for efficient handling of large-scale biomedical datasets on multi-node systems.</li></ul>	
<b>UCLA COSMOS (Brain-Inspired Computing/Artificial Intelligence Cohort)</b> <i>Student Researcher</i>	July 2024 - August 2024 California
<ul style="list-style-type: none"><li>Developed neural networks based on neurobiological principles to model rat hippocampus activity, perform image geolocation, and character recognition.</li><li>Applied computational modeling techniques to neuroscience problems using Jax, Torch, and TensorFlow.</li></ul>	
<b>FRC Team 604: Quixilver Robotics</b> <i>Controls/Software Lead (10)</i>	June 2022 - Present California
<ul style="list-style-type: none"><li>Implemented real-time computer vision systems for autonomous robot navigation and object detection.</li><li>Designed stratic robotic mechanisms and integrated multi-modal sensors for optimal robot performance and reliability.</li><li>Developed competition data collection infrastructure and visualization tools analyzing 1000+ competition matches with 200+ users.</li><li>Achieved top 0.1% international ranking (12/10,000+ teams) through integrated hardware-software optimization.</li></ul>	
<b>Pavyl</b> <i>Software Design Advisor</i>	January 2025 - Present California
<ul style="list-style-type: none"><li>Evaluated memory and computational efficiency of infinite context large language models.</li><li>Recommended app optimizations for model accuracy, external tool integration, and response time.</li></ul>	

## PROJECTS

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

## EDUCATION

<b>Leland High School</b> Junior (Expected Graduation 2026)	4.00 UW A-G San Jose, CA
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## SKILLS

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

• FRC604: City of San Jose Recognition for STEM Outreach and Team Performance	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