# ABHAY SHUKLA

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## EXPERIENCE

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

- Developed Machine Learning/Computer Vision foundation models for breast cancer research, leveraging CNNs, ViTs, unlabeled data, and medical priors to accuratly segmente microscopic tumors, significant anatomical structures, and general breast regions under Stanford Researcher Chris Sadée.
- Produced detailed scientific documentation to communicate research findings.

**UCLA COSMOS (Brain-Inspired Computing/Artificial Intellegence Cohort)** July 2024 - August 2024
*Student Researcher* *California*

- Integrated foundational neurobiological principles into machine learning models for image geolocation, rat neuron behavior decoding, and handwritten character recognition under mentorship of UCLA Behavioral Neuroscience Prof. Blair.

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

- Designed and implemented high-performance FRC robot components, integrating strategic mechanism design, real-time computer vision, and multi-modal sensor fusion to boost autonomous and teleoperated robot performance and achieve a top 0.1% team ranking (12/10,000+) internationally.
- Led 15+ members in developing a real-time FRC competition data collection and visualization app, empowering data-driven competitive match strategy and optimal partner selection. App currently serves 175+ users and has collected data for 1000+ matches.

**Pavyl** January 2025 - Present
*Software Design Advisor* *California*

- Evaluated an innovative large language model with infinite context (chat history) and provided recommendations to optimize memory capabilities, model accuracy, external tool use, and response time, enabling an improved user experience.

**Bay Area STEM Academy** January 2023 - Present
*Co-founder* *California*

- Introduced 500+ 3rd-9th grade students to STEM (robotics, astrophysics, 3D design, ML, etc), raised $6,000+ to support local STEM education, recruited 20+ academy mentors, and received grants from the city of San Jose (CA).

## PROJECTS

**StereoSampleGAN - *GitHub Repo***

- Developed one of the first generative AI architectures capable of high-quality stereo audio generation using effective signal processing, efficient training techniques, and custom-collected drum data.
- Model pioneered high-fidelity stereo audio while increasing audio quality by 85% and reducing training time by 25x (compared to DrumGAN & WaveGAN respectively).

**Vox Transformis - *Science Fair***

- Developed an AI-based framework to expand user exposure to rare languages by taking a novel approach to audio translation using multimodal large language models with tool use to preserve rhythmic, literal, and melodic features.

**SporeStrike - *Pitch Slide Deck***

- Engineered an affordable drone-based fungicide disposal system and 3D-printed prototypes to reduce fungal infection destruction on farms and corresponding food waste. Project won first place out of 260 teams at the 2024 FlexFactor Entrepreneurship Championships.

## EDUCATION

**Leland High School** *4.00 UW A-G*
Junior *San Jose, CA*

## SKILLS

**Technical Fields** AI/ML, Robotics, Research, Signal Processing, 3D Printing, CAD, Webdev/Appdev

## HONORS & AWARDS

- FRC604: City of San Jose Recognition for STEM Outreach and Team Performance 2024
- WCP CADathon/Robot Design Challenge Finalist (Top 1% Internationally) 2024
- FRC604: World Championship Milstein Division Winner (12/3500 Internationally, 4/300 in CA) 2024
- OneHacks III Hackathon: Third Place (3/120 Internationally) 2023