ABHAY SHUKLA

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EXPERIENCE

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

· Developed scalable Machine Learning/Computer Vision foundation models for segmenting microscopic and massive anatomical structures in medical imagery.
· Produced detailed scientific documentation to communicate research findings. All research done under the mentorship of researcher Chris Sadée.

UCLA COSMOS (Brain-Inspired Computing/Artificial Intellegence Cluster)   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 the mentorship of UCLA Prof. Hugh Tad Blair.

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

· Designed and implemented high-performance FRC robot components, integrating real-time computer vision, multi-modal sensor integration, and strategic mechanism design 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 platform, empowering data-driven competitive match strategy and optimal partner selection. App currently serves 175+ users and has collected data for 1000+ matches.

PROJECTS

StereoSampleGAN - *GitHub Repo*

· Developed a novel generative AI architecture for high-quality stereo audio generation leveraging custom-collected drum data, effective signal processing representations, and efficient training techniques
· Architecture is one of th first models to generate stereo audio at 44.1 kHz. Also increased audio quality by 85% and reducied training time by 25x (compared to DrumGAN & WaveGAN respectively).

Vox Transformis - *Science Fair*

· Developed an AI-based framework to expand exposure to rare languages by using mutlimodal large language models to translate audio while preserving rhythmic, literal, and melodic features.

SporeStrike - *Pitch Slide Deck*

· Engineered an affordable drone-based fungicide disposal system and 3D-printed prototypes to prevent food waste equivalent to feeding 4 billion people. Project won first place at the 2024 FlexFactor Entrepreneurship Championships (1/260).

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
- FRC604: World Championship Milstein Division Winner (12/3500 Internationally, 4/300 in CA)   2024
- OneHacks III Hackathon: Third Place (3/120 Internationally)   2023