ABHAY SHUKLA

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EXPERIENCE

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

- Developed multi-GPU ML/CV algorithms for microscopic and large medical imager region segmentation (supervised & unsupervised).
- Produced detailed scientific documentation to communicate research findings. All research done under the mentorship of researcher Chris Sadée.

UCLA COSMOS (CA Summer School for Mathematics & Science) July 2024 - August 2024
Brain-Inspired Computing Cohort Member *California*

- Integrated foundational neurobiological principles into machine learning models for rat neuron behavior, image geolocation, and 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 tele-autonomous FRC robots, integrating real-time computer vision, multi-modal sensor integration, and strategic mechanism design to boost autonomous 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, transforming 8 years of team knowledge into informed strategic decision-making. App currently serves 175+ users who have 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 pioneers stereo audio generation at 44.1 kHz 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 translate audio while preserving rhythmic, literal, and melodic creatures by utilizing multimodal LLMs, voice cloning, and a phonetically constrained DTW algorithm.

SporeStrike - Pitch Slide Deck

- Engineered an affordable drone-based fungicide disposal system and 3D-printed prototypes to improve efficiency of farm fungicide disposal and prevent food waste equivalent to feeding 4 billion people. First place project 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 10 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