HAO CHEN

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EDUCATION

Cornell University **Ithaca, NY**
B.S. Information Science (Honors), minor in Computer Games September 2021 – May 2024
Coursework: Machine Learning, Robot Learning, Computer Vision & Graphics, Game Architecture, Database, NLP, Web

WORK EXPERIENCE

Skywalk **Palo Alto, CA**
Software Engineer August 2024 – Present
- Built machine learning architectures on **Azure**; optimized training methods for noise removal algorithms.
- Integrated custom voice enhancement model with state-of-the-art speech recognition APIs in an **iOS** app using **Swift.**
- Implemented automated dataset generation pipelines; achieved sample-level signal synchronization for multiple microphones.
- Experimented synthetic data generation using diffusion-based speech enhancement models.

Software Engineer Intern June 2024 – August 2024
- Developed a multithreaded GUI for whisper speech data collection on earbuds, generated datasets from comprehensive experiment data logging - audio timestamps, microphone byte counts, paired prompt entries, and system errors.
- Trained a CNN model to detect frequency features and determine the in-ear channels from multichannel earbud data; implemented a solution to correct channel swapping induced by packet loss in Bluetooth connections.

XR Collaboratory **New York, NY**
Software Engineer Intern June 2023 – August 2023
- Composed a reusable **C# Unity** package with API for tree traversal visualization in Virtual Reality
- Prototyped spatial interactions for hierarchical object manipulation; rendered 3D scenes on **Oculus.**
- Conducted semi-structured user studies iteratively to enhance the user experience of navigating complex file structures.

Game Design Initiative at Cornell **Ithaca, NY**
Full Stack Developer January 2023 – May 2023
- Collaborated developing and testing games for iOS and Android, from prototypes to app store releases.
- Designed a real-time player data storage pipeline, implemented efficient data querying and fetching updates in scene graph.
- Optimized rendering by implementing a grid system and a JSON parsing interface for tile map creation with GUI; enabled graph-based collision detection, BFS pathfinding, and NPC state machine behaviors.

RESEARCH EXPERIENCE

Smart Computer Interfaces for Future Interactions (SciFi) Lab **Ithaca, NY**
Machine Learning Research Assistant June 2022 – May 2023

HPSpeech: Silent Speech Interface for Commodity Headphones *(ISWC Best Paper Honorable Mention Award, 2023)*
https://dl.acm.org/doi/10.1145/3594738.3611365
- Developed a **computer vision** model that recognizes 8 frequently used silent-speech commands with accuracy exceeding 90%, enabling intuitive music player and gaming control integrated into off-the-shelf headphones.
- Implemented a **signal processing** pipeline that filters FMCW signals based on frequencies and boosts acoustic clarity.

PoseSonic: 3D Upper Body Pose Estimation Through Egocentric Acoustic Sensing on Smartglasses *(IMWUT 2023)*
https://doi.org/10.1145/3610895
- Implemented various **PyTorch** machine learning architectures, including Transformer, VAE, GAN, and Diffusion; and evaluated their performance on 3D landmark prediction tasks across varying image data volumes.
- Analyzed and visualized data using **A/B testing** to assess the user experience of eating habit tracking on eyeglasses.

C-Auth: Exploring the Feasibility of Using Egocentric View of Face Contour for User Authentication on Glasses.
(ISWC 2023) https://doi.org/10.1145/3594738.3611355
- Trained and evaluated an authentication model achieving true positive rate of 98.0% and false positive rate of 4.97%.
- Implemented a **Raspberry Pi** data collection application that records the facial contour lines under various facial expressions.

SKILLS & INTERESTS

Programming: Python, PyTorch, Azure, Swift, C#, Unity, SQL, JavaScript, React, Arduino
Design: Adobe (Photoshop, Illustrator, After Effects), Fabrication (3D Printing, CAD), Video (Final Cut), Audio (Ableton Live)
Languages: English, Mandarin