

SUQI ZHANG

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Education

The Chinese University of Hong Kong

Master in Electronic and Engineering

Sept. 2024 – Now

Hong Kong, China

Xi'an Jiaotong-Liverpool University

Bachelor of Science in Information and Computing Science, GPA:3.90/4.0

Sept. 2020 – July 2024

Jiangsu, China

Skills & Interests

Skills: PyTorch, Python, Java, C, C++, Matlab, Linux, OpenGL, L^AT_EX, GitHub

Interests: Speech processing, Deep Learning, Generative Model

Relevant Coursework

- Machine Learning
- Artificial Intelligence
- Neural Networks & Deep Learning
- Python Programming
- Advanced OO Programming
- Algorithmic Foundations and Problem Solving
- Bio-Computation
- Spoken Language Processing
- Software Engineering Group Project
- Decision Computation and Language
- Audio Signal Processing for Music Applications

Experience

Deep Source Separation for Speech Using Generative Models

Ongoing project since Aug. 2023

Research project Advised by Dr. Yin Cao

- Focused on speech enhancement (SE) by enhancing the desired speaker's voice from noisy speech, with an emphasis on recovering parts of the speech that are heavily masked by noise.
- Applied additional distortion methods to diversify the training data, such as analog-to-digital conversion, anti-automatic gain control, and Global System for Mobile Communications (GSM) transmission, making the model more robust in real-world noisy environments.
- Experimented with a GAN-based method, inspired by MetricGAN, combining the lightweight SE model DeepFilterNet2 as the generator and a metric-estimated network as the discriminator. The approach directly optimizes evaluation metrics to improve SE results.
- Trying to utilize SGMSE, a score-based generative diffusion model with its diffusion process based on stochastic differential equations (SDEs), to generate more natural speech by using latent features from DeepFilterNet2 as a condition to guide the SGMSE model in generation.

Source Separation for Speech or Music

June - Sept. 2023

Summer Undergraduate Research Fellowship Program, Advised by Dr. Yin Cao

- Studied courses and textbooks of signal and systems and digital signal processing.
- Conducted a literature review in the field of source separation.
- Deep dived into deep learning libraries for speech processing, i.e., 'Asteroid', to learn models and implementations for speech separation and speech enhancement, such as Demucs and DPRNNTasNet.
- Enhanced hands-on experience of DPRNNTasNet. Created a simplified inference, and integrated the model's structural code into a new package to facilitate the independent use of the model without the need for complex cross-referencing of multiple files.

Convolutional Embeddings for Domain Adaptation in Medical Segmentation

June - Sept. 2022

Summer Undergraduate Research Fellowship Program, Advised by Dr. Erick Purwanto

- Aimed at identifying and segmenting functional tissue units (FTUs) across five human organs.
- Pre-trained EfficientNetB7 with datasets containing human kidney tissue images from "HuBMAP - Hacking the Kidney Competition" for better model initialization and generalization ability.
- Pre-processed the training data with data augmentation including Gaussian blurring, rotation, shifting, etc. and performed color normalization to eliminate the color inconsistency within the training set and the test set.
- Performed ensemble learning to leverage multiple models including ResNet50 and EfficientNetB7.
- Introduced multi-modal and convolutional embedding representations that provide embedding for data from different organs and institutions, which improves model's generalization ability and enables the model to adapt to different scenarios. Seven channels are added to the original RGB channels, in which five channels are used to encode information of organ types and two channels are for encoding the information of institutions.
- Achieved an accuracy of 0.81 in "HuBMAP + HPA - Hacking the Human Body"-2022 Kaggle Competition, ranked in the top 50 among 1175 teams.

Course Projects

IPet - Pet Grooming Website Development | *Software Engineering Group Project* **Feb. - Jul. 2023**

- Collaborated with team members adhering to the Software Development Process and developed an online system for managing pet grooming appointments, aiming to offer pet owners a convenient and swift booking service while addressing challenges related to pet information management, orders, and updates.
- Designed and implemented an integrated pet information management platform to cater to the needs of both pet owners and service providers, e.g., editing personal information, adding new pets by users as well as searching for appointment history based on keywords.
- Integrated front-end design with back-end technologies to resolve the drawbacks of traditional pet information management, which provides a more systematic and streamlined process for handling pet details and orders.
- Enhanced user experience by improving the design of front-end, ensuring effortless usability for both pet owners and service providers.

Questionnaire-Based Classification of Student Majors | *Coursework of Artificial Intelligence* **May 2022**

- Explored both supervised and unsupervised machine learning approaches for the classification of students' majors using questionnaire responses.
- Performed PCA, t-SNE to reduce feature dimensionality and trained supervised classifiers including RandomForest, KNN, MLP with the selected input features. Unsupervised classifier K-means was trained on data with different dimensionalities, followed by the silhouette score for searching optimal number of clusters.

Honors & Awards

Grand Prize (CNY 2000) and Top 3 in XJTLU Student Research-Led Learning Symposium *Nov. 2023*

First Prize and Top 3 in XJTLU Student Research-Led Learning Symposium *Oct. 2022*

Summer Undergraduate Research Fellowship Winner, School of Advanced Technology *Sept. 2022*

University Academic Achievement Award - Top 10% students *Aug. 2022, 2021*

Third prize in *DJI* RoboMaster Competition - University League *May, 2021*