Wenzhe Xu

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EDUCATION

University of Toronto, Toronto, ON
MS in Applied Computing, Computer Science Concentration, GPA: 4.0/4.0 Sep 2022 – Jun 2024
Relevant Coursework: Machine Learning, Neural Networks and Deep Learning, Natural Language Processing, Computational Imaging

Cornell University, Ithaca, NY
BS in Operations Research and Engineering, GPA: 4.09/4.3, *summa cum laude* Aug 2016 – May 2020
Relevant Coursework: Object-Oriented Programming and Data Structures, Statistical Data Mining, Simulation Modeling and Analysis

PROFESSIONAL EXPERIENCE

Machine Learning Research Intern
Nureva Inc., Calgary, AB May 2023 – Dec 2023

- Adapted a **CRNN** model for ambisonic **sound localization** to linear microphones. Optimized the model through data augmentation, feature extractor modifications, and network architecture improvements, achieving a mean error of **4.3 degrees** in DOA estimation.
- Researched objective metrics for the estimation of Quality of Experience in audio conferencing. Collected audio clips, established a reference standard, and developed a **Flask**-based audio evaluation system to streamline Mean Opinion Scores (MOS) collection.
- Evaluated traditional and deep learning metrics for MOS prediction and fine-tuned selected **CNN-LSTM** and **CNN-Self-Attention** models, achieving a rank correlation above **0.80** and effectively aligning objective assessments with human auditory perceptions.

Applied Research Engineer, Consumer Market Insight
CityDO Technologies Co., Ltd., Hangzhou, China Oct 2020 – Dec 2021

- Developed a web scraper to collect **6,000** consumer comments on tea drink products, and trained an ensemble model consisting of **LSTM** with pre-trained **Word2Vec** + **Naïve Bayes** for **sentiment analysis**, providing actionable insights for marketing strategies.
- Developed data dashboards and generated graphical representations to visualize KPIs for the beverage chain by preparing and analyzing data using **SQL** and **Python**, demonstrating a **9%** increase in net promoter score and improved customer satisfaction.
- Conducted thorough local solution testing using **Docker** and **Jupyter Notebook**, proficiently managed project issues and tickets on **Jira**, and organized project workflows through **GitLab** with an average of 30 monthly commits.

Summer Intern, Data Analytics and Machine Learning
Hithink RoyalFlush Information Network Co., Ltd., Hangzhou, China May 2019 – Aug 2019

- Developed and implemented an enhanced **tiny-YOLOv3** model that incorporates **K-means clustering** to optimize anchor boxes, improving pedestrian detection accuracy by **5.11%** compared to the standard tiny-YOLOv3 model.
- Improved the tiny-YOLOv3 network by integrating a deep residual network and introducing a 1x1 convolutional kernel, significantly enhancing feature extraction capabilities and overall detection accuracy while maintaining real-time processing speeds.

Research Assistant
College of Chemical and Biological Engineering, Zhejiang University, Hangzhou, China May 2018 – Aug 2018

- Prepared nanoporous zeolite thin films and examined their adsorption capacity for alkanes. Implemented **3D convolutional neural networks** to predict the logarithms of Henry's adsorption constant of zeolites based on their distance grids.
- Conducted systematic evaluations of 3D variants of popular architectures (AlexNet, VGGNet, ResNet), achieving a MSE of **4.5** and a correlation coefficient of **0.968**, reducing computation time from **hours to seconds** compared to traditional simulations.

ACADEMIC PROJECTS

Artistic GENREator Jan 2023 – Apr 2023

- Developed a **lyrics generation** model that creates lyrics based on user-specified musical genres and starting prompts. Retrieved and preprocessed **5,000** song lyrics through web scraping, and fine-tuned **HuggingFace**'s pretrained **GPT-2** model for lyrics generation.
- Devised and implemented custom metrics (word repetition, word variation, point-of-view) to evaluate the similarities between the training corpus and generated lyrics, demonstrating superior performance over methods proposed in previous studies.

FFTResCNN Sep 2022 – Dec 2022

- Proposed a neural network architecture, FFTResCNN, that incorporates Fast Fourier Transform and residual blocks for **image denoising**, effectively integrating time and frequency information to preserve both high- and low-frequency details.
- Compared the performance of FFTResCNN against established denoising methods (BM3D, DnCNN, ResDnCNN), demonstrating a **0.15-0.30 dB** improvement in average PSNR across varied noise levels.

SKILLS

Programming & Tools: Python, Java, SQL, R, MATLAB, Git, LaTeX, Tableau, Docker, AWS
Libraries & Frameworks: PyTorch, TensorFlow, Numpy, Pandas, Keras, OpenCV, Matplotlib, Scikit-Learn, NLTK, BeautifulSoup