Bo-Wen Chen

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Education

National Taiwan University (NTU) — Taipei, Taiwan

M.S. in Graduate Institute of Communication Engineering (Advisor: Hung-yi Lee) — Sep. 2018 - Nov. 2022

- Selected Courses: Introduction to Digital Speech Processing, Deep Learning for Computer Vision, Data Science

National Taiwan University (NTU) — Taipei, Taiwan

B.S. in Electrical Engineering (Overall GPA: 3.46/4.3, Last 60: 3.77/4.3) — Sep. 2014 - Jun. 2018

- Selected Courses: Machine Learning, Mathematical Principles for Machine Learning, Advanced Digital Signal Processing, Convex Optimization, Computer Architecture, Algorithms, Data Structure and Programming

Skills

Core competencies	Machine Learning, Digital Speech Processing, UNIX-like Operating Systems
Languages	Python, C/C++, Verilog, Shell Scripting, LaTeX
Libraries & Platforms	Fairseq, PyTorch, TensorFlow, Kaldi, Git, Arch Linux

Research Experience

Speech Processing & Machine Learning Laboratory, NTU — Taipei, Taiwan

Graduate Researcher, supervised by Prof. Hung-Yi Lee — Sep. 2018 - Nov. 2022

- Conducted research in speech processing and acoustic modeling utilizing deep learning techniques to explore novel topics
- Proposed the **first duplex speech chain model** capable of performing Text-to-Speech (TTS) and Automatic Speech Recognition (ASR) simultaneously through the use of a single reversible network, enabling the effective use of supervision signals from both directions [1]
- Proposed a rapid neural architecture search approach on audio source separation that utilizes the positive correlation in performance shown between models with fixed randomly weighted layers and their fully trained counterparts [2]
- Served as a reviewer for ICASSP 2020

Network Administrator — Sep. 2018 - Jun. 2020

- Managed the Slurm-based computation cluster (10 nodes, over 20 GPUs) and handled issues for more than 30 users
- Implemented maintenance scripts for rapid system upgrade on all nodes within the cluster

Publications

[1] **Bo-Wen Chen**, **An Analysis of Duplex Sequence-to-Sequence Learning for Speech Chain**, Master's thesis, National Taiwan University Theses and Dissertations Repository, 2022. [link]

[2] **Bo-Wen Chen**, Yen-Min Hsu, and Hung-Yi Lee, **J-Net: Randomly Weighted U-Net for Audio Source Separation**, CoRR, abs/1911.12926 (arXiv preprint), 2019. [link][Github]

Work Experience

WinYam Innovative Studio — Taipei, Taiwan

Sole Proprietorship Project Manager — Sep. 2015 - Present

- Oversee the development, testing, and launch of new features or modules for the tour guide system [link]

Acoustic and Speech Processing Team of Multimedia Department, MediaTek — Hsinchu, Taiwan

Software Engineer Intern, supervised by Yiou-Wen Cheng — Jul. 2017 - Aug. 2017

- Compressed acoustic models via knowledge distillation, maintaining a modest performance decline with 50% fewer parameters
- Created a toolkit to facilitate seamless migration of acoustic models from Kaldi to Tensorflow, effectively reducing development time

Institute of Information Science, Academia Sinica — Taipei, Taiwan

Research Intern, supervised by Dr. Tyng-Luh Liu — Jul. 2016 - Aug. 2016

- Reimplemented a super-resolution model, which predicted the residual between the original image and its super-resolved counterpart

Awards and Projects

Honorable Mention Award — Ministry of Education, Taiwan

AI CUP - Abstract Label Classification Competition — Built with Pytorch and Fairseq

- Achieved 8th place out of 469 teams on the leaderboard as team leader
- Used pretrained language models, SCIBERT, with additional linear layers to perform sequential sentence classification [Github]

Dunhuang Image Restoration — National Taiwan University, Taiwan

Deep Learning for Computer Vision, CommE 5052 — Built with Pytorch

- Implemented a generative inpainting network by incorporating gated convolutions and SN-PatchGAN loss, with U-Net as the backbone
- Surpassed the baseline model by achieving a 0.011 improvement in SSIM and reducing the MSE by 60%

Tor Packet Detection — National Taiwan University, Taiwan

Electrical Engineering Lab (Networking and Multi-media), EE 3002 — Built with Python and React.js

- Implemented a website that provides an intuitive interface for users to track dark web flow and identify potential security threats
- Integrated python code with React server API, and conducted debugging to ensure smooth operation [Github]