

Yicheng Gu

yichenggu@link.cuhk.edu.cn | github.com/VocodexElysium

KEY SKILLS

Solid Domain Knowledge: Extensive knowledge of Deep Learning and Digital Signal Processing; specifically applied to Neural Vocoder, Neural Audio Codec, and Digital Audio Effects.

Multi-disciplinary: Experience encompassing Research, Open Source Systems, Dataset Development, Commercial Sound Design, and Music Production.

EDUCATION

The Chinese University of Hong Kong, Shenzhen

Bachelor of Engineering in Computer Science and Engineering

Shenzhen, China

Sep. 2022 – Present

- GPA: 3.965 / 4.0, Ranking: 2 / 308 (Top 1%)

Aalto University

Exchange Student in Computer Science

Espoo, Finland

Sep. 2024 – Present

EXPERIENCE


Human Language Technology Lab

Research Assistant, School of Data Science, CUHK-Shenzhen

Shenzhen, China

Oct. 2022 – Present

Supervisor: Prof. Zhizheng Wu

- Singing Voice Conversion
 - * Investigated characteristics and the complementary role of different Content-Based Features for the Singing Voice Conversion system.
- Neural Vocoder
 - * Built a Discriminator based on the Constant-Q Transform (CQT) and Continuous Wavelet Transform (CWT) via Representation Learning and explored their complementary role with the Short-Time Fourier Transform (STFT) to improve the Vocoder's synthesis quality. The methods have been implemented and supported by NVIDIA BigVGAN .

Shanghai AI Laboratory

Research Assistant

Shanghai, China

Dec. 2023 – Present

Supervisor: Dr. Yanhong Zeng

- Video-to-Audio Generation
 - * Integrated IP-Adapter and Sound Event Detection model to existing Audio Generation pipeline, obtaining both Audio-Visual Synchronization and Text-Controllability.

Aalto University

Visiting Scholar

Espoo, Finland

Sep. 2024 – Present

Supervisor: Prof. Lauri Juvela

- Differentiable Digital Signal Processing

PROJECTS

Amphion

An Open-Source Audio, Music and Speech Generation Toolkit

- Migrate and adapt various well-known, widely used, or SOTA vocoders into our system, including: MelGAN, HiFi-GAN, BigVGAN, NSF-HiFiGAN, APNet, etc.
- Integrate comprehensive Objective Evaluation Metrics to the framework.

FoleyCrafter

Bring Silent Videos to Life with Lifelike and Synchronized Sounds

- Integrate baseline model and develop the temporal adapter for controlling timestamp details.

PUBLICATIONS

Yicheng Gu, Xueyao Zhang, Liumeng Xue, Zhizheng Wu, "Multi-Scale Sub-Band Constant-Q Transform Discriminator for High-Fidelity Vocoder," ICASSP 2024.

Yicheng Gu, Xueyao Zhang, Liumeng Xue, Haizhou Li, Zhizheng Wu, "An Investigation of Time-Frequency Representation Discriminators for High-Fidelity Vocoder," Submitted to TASLP.

Xueyao Zhang*, Liumeng Xue*, **Yicheng Gu***, Yuancheng Wang*, et al., "Amphion: An Open-Source Audio, Music and Speech Generation Toolkit," SLT 2024.

Xueyao Zhang, **Yicheng Gu**, et al., "Leveraging Content-based Features from Multiple Acoustic Models for Singing Voice Conversion," Machine Learning for Audio Workshop at NeurIPS 2023.

Yiming Zhang, **Yicheng Gu**, Yanhong Zeng, et al., "FoleyCrafter: Bring Silent Videos to Life with Lifelike and Synchronized Sounds," Submitted to NeurIPS 2024.

Haorui He*, Zengqiang Shang*, Chaoren Wang*, Xuyuan Li*, **Yicheng Gu**, et al., "Emilia: An Extensive Multilingual and Diverse Speech Dataset for Large-Scale Speech Generation," SLT 2024.

Xueyao Zhang, Zihao Fang, **Yicheng Gu**, et al., "Leveraging Diverse Semantic-based Audio Pretrained Models for Singing Voice Conversion," SLT 2024.

HONORS AND AWARDS

- "LanHuaYing" Scholarship (Top 10 admitted students in Zhejiang Province, 2022)
- The Academic Performance Scholarship, Class A (Top 1%, 2024)
- The Academic Performance Scholarship, Class B (Top 3%, 2023)
- University Entrance Scholarship (Top 0.7% in Zhejiang Province, 2022)
- Gold Award of the 2019 Shanghai STEED Programming Contest (Top 3, 2019)
- First Prize of the 16th Youth Computer Robot Competition in Provinces (Top 3, 2019)
- Deans List (Top 10%, 2022)
- Bowen Entrance Scholarship (2022)
- Undergraduate Research Award (2023-2024)

CROSS-DISCIPLINARY ABILITIES

Music Production: experienced in Composing, Mixing, and Mastering for different genres including Pop, Electronic, etc.

Sound Design: experienced in Sound Designing for movie, game, etc.