Yicheng Gu

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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 — Shenzhen, China
Bachelor of Engineering in Computer Science and Engineering — *Sep. 2022 – Present*
- GPA: 3.965 / 4.0, Ranking: 1 / 298

Aalto University — Espoo, Finland
Exchange Student in Computer Science — *Sep. 2024 – Present*
- GPA: 4.80 / 5.0

EXPERIENCE

Human Language Technology Lab — Shenzhen, China
Research Assistant, School of Data Science, CUHK-Shenzhen — *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 — Shanghai, China
Research Assistant — *Dec. 2023 – Mar. 2025*
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.

Acoustic Lab — Espoo, Finland
Visiting Scholar, DICE, Aalto University — *Sep. 2024 – Jun. 2025*
Supervisor: Prof.Lauri Juvela

- Digital Audio Effects
  * Proposed the SOTA Neural Autotune benchmarking against Melodyne.
  * Proposed the first large-scale and diverse dataset for Virtual Analog Modeling.

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.
- 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, Haizhou Li, Zhizheng Wu, "An Investigation of Time-Frequency Representation Discriminators for High-Fidelity Vocoder," TASLP.

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

Yicheng Gu, Chaoren Wang, Zhizheng Wu, Lauri Juvela, "Neurodyne: Neural Pitch Manipulation with Representation Learning and Cycle-Consistency GAN," submitted to Interspeech 2025.

Yicheng Gu*, Runsong Zhang*, Lauri Juvela, Zhizheng Wu, "Diff-SSL-G-Comp: Towards a Large-Scale and Diverse Dataset for Virtual Analog Modeling," submitted to DAFx 2025.

Xueyao Zhang*, Liumeng Xue*, **Yicheng Gu***, Yuancheng Wang*, et al., "Amphion: An Open-Source Audio, Music and Speech Generation Toolkit," SLT 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, **Yicheng Gu**, et al., "Leveraging Content-based Features from Multiple Acoustic Models for Singing Voice Conversion," Machine Learning for Audio Workshop at NeurIPS 2023.

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

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

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

HONORS AND AWARDS

- The Nobel Class (Top 1, 2024)
- The Academic Performance Scholarship, Class A (Top 1%, 2024)
- The Academic Performance Scholarship, Class B (Top 3%, 2023)
- "LanHuaYing" Scholarship (Top 10 admitted students in Zhejiang Province, 2022)
- University Entrance Scholarship (Top 0.7% in Zhejiang Province, 2022)
- Deans List (Top 10%, 2022-2025)
- Bowen Entrance Scholarship (2022)
- Undergraduate Research Award (2023-2025)

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.