

WEN-CHIN HUANG

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<https://unilight.github.io/>

RESEARCH INTERESTS

Applications of deep learning to speech processing, including voice conversion and speech synthesis.

EDUCATION

Nagoya University Apr. 2021 - Mar. 2024 (expected)

Ph.D candidate, Graduate School of Informatics

Advisor: Prof. Tomoki Toda

Nagoya University Apr. 2019 - Mar. 2021

M.S., Graduate School of Informatics

Advisor: Prof. Tomoki Toda

Thesis: Transfer Learning for Sequence-to-Sequence Voice Conversion

National Taiwan University Sep. 2014 - Jun. 2018

B.S. in Computer Science & Information Science

Overall GPA 3.79/4.3; Last 60 4.04/4.3

PROFESSIONAL EXPERIENCES

Facebook Reality Labs Research, Pittsburgh, PA, USA Aug. 2021 - Present

Position: Research Intern. *Advisor:* Dr. Dejan Markovic

NTT Communication Science Laboratories, NTT Corp., Japan Aug. 2019 - Sep. 2019

Position: Research Intern. *Advisor:* Dr. Hirokazu Kameoka

Institute of Information Science, Academia Sinica, Taiwan Jul. 2017 - Mar. 2019,

Aug. 2020 - Mar. 2021

Position: Research Assistant. *Advisor:* Dr. Hsin-Min Wang, Dr. Yu Tsao

ACADEMIC ACTIVITIES

Organizer/Committee Member

1. Organizing Committee, Voice Conversion Challenge 2020

Reviewer

1. IEEE Speech Processing Letters (2020-2021)
2. IEEE Transactions on Audio, Speech and Language Processing (2020-2021)
3. IEEE Computational Intelligence Magazine (2021)
4. IEEE Transactions on Geoscience and Remote Sensing (2021)
5. Neural Networks (2020)
6. Entertainment Computing (2021)
7. Joint Workshop for the Blizzard Challenge and Voice Conversion Challenge 2020
8. Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (AP-SIPA ASC) (2021)

HONORS

- **Research Fellowship for Young Scientists (DC1)**, from Japan Society for the Promotion of Science (JSPS), April 2021 - March 2024
- **Scholarship for International Students**, JEES Docomo, April 2019 - March 2021
- **Travel grant**, ISCA and Interspeech 2019
- **Best Student Paper Award**, The 11th International Symposium on Chinese Spoken Language Processing (ISCSLP), 2018

PUBLICATIONS

Journals

1. W.-C. Huang, T. Hayashi, Y. C. Wu, H. Kameoka, and T. Toda, “Pretraining techniques for sequence-to-sequence voice conversion,” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 29, pp. 745–755, 2021
2. H. Kameoka, W.-C. Huang, K. Tanaka, T. Kaneko, N. Hojo, and T. Toda, “Many-to-many voice transformer network,” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 29, pp. 656–670, 2021
3. W.-C. Huang, H. Luo, H.-T. Hwang, C.-C. Lo, Y.-H. Peng, Y. Tsao, and H.-M. Wang, “Unsupervised Representation Disentanglement Using Cross Domain Features and Adversarial Learning in Variational Autoencoder Based Voice Conversion,” *IEEE Transactions on Emerging Topics in Computational Intelligence*, vol. 4, no. 4, pp. 468–479, 2020
4. X. Wang, J. Yamagishi, M. Todisco, H. Delgado, A. Nautsch, N. Evans, M. Sahidullah, V. Vestman, T. Kinnunen, K. A. Lee, L. Juvela, P. Alku, Y.-H. Peng, H.-T. Hwang, Y. Tsao, H.-M. Wang, S. L. Maguer, M. Becker, F. Henderson, R. Clark, Y. Zhang, Q. Wang, Y. Jia, K. Onuma, K. Mushika, T. Kaneda, Y. Jiang, L.-J. Liu, Y.-C. Wu, W.-C. Huang, T. Toda, K. Tanaka, H. Kameoka, I. Steiner, D. Matrouf, J.-F. Bonastre, A. Govender, S. Ronanki, J.-X. Zhang, and Z.-H. Ling, “Asvspoof 2019: a large-scale public database of synthesized, converted and replayed speech,” *Computer Speech & Language*, vol. 64, p. 101114, 2020

Peer-reviewed Conferences and Workshops

1. W.-C. Huang, T. Hayashi, X. Li, S. Watanabe, and T. Toda, “On Prosody Modeling for ASR+TTS based Voice Conversion,” in *Proc. ASRU*, 2021
2. M.-C. Yen, W.-C. Huang, K. Kobayashi, Y.-H. Peng, S.-W. Tsai, Y. Tsao, T. Toda, J.-S. Jang, and H.-M. Wang, “Mandarin Electrolaryngeal Speech Voice Conversion with Sequence-to-Sequence Modeling,” in *Proc. ASRU*, 2021
3. Y.-S. Liou, W.-C. Huang, M.-C. Yen, S.-W. Tsai, Y.-H. Peng, T. Toda, Y. Tsao, and H.-M. Wang, “Time Alignment using Lip Images for Frame-based Electrolaryngeal Voice Conversion,” in *Proc. APSIPA ASC*, 2021
4. C. Xie, Y.-C. Wu, P. L. Tobing, W.-C. Huang, and T. Toda, “Noisy-to-noisy Voice Conversion Framework with Denoising Model,” in *Proc. APSIPA ASC*, 2021
5. D. Ma, W.-C. Huang, and T. Toda, “Investigation of Text-to-speech-based Synthetic Parallel Data for Sequence-to-sequence Non-parallel Voice Conversion,” in *Proc. APSIPA ASC*, 2021
6. W.-C. Huang, K. Kobayashi, Y.-H. Peng, C.-F. Liu, Y. Tsao, H.-M. Wang, and T. Toda, “A Preliminary Study of a Two-Stage Paradigm for Preserving Speaker Identity in Dysarthric Voice Conversion,” in *Proc. Interspeech*, 2021, pp. 1329–1333
7. Y.-C. Wu, C.-H. Hu, H.-S. Lee, Y.-H. Peng, W.-C. Huang, Y. Tsao, H.-M. Wang, and T. Toda, “Relational Data Selection for Data Augmentation of Speaker-dependent Multi-band MelGAN Vocoder,” in *Proc. Interspeech*, 2021, pp. 3630–3634

8. W.-C. Huang, C.-H. Wu, S.-B. Luo, K.-Y. Chen, H.-M. Wang, and T. Toda, "Speech recognition by simply fine-tuning bert," in *Proc. ICASSP*, 2021, pp. 7343–7347
9. W.-C. Huang, T. Hayashi, Y.-C. Wu, and T. Toda, "Any-to-One Sequence-to-Sequence Voice Conversion using Self-Supervised Discrete Speech Representations," in *Proc. ICASSP*, 2021, pp. 5944–5948
10. K. Kobayashi, W.-C. Huang, Y.-C. Wu, P. L. Tobing, T. Hayashi, and T. Toda, "CRANK: an Open-Source Software for Nonparallel Voice Conversion based on Vector-Quantized Variational Autoencoder," in *Proc. ICASSP*, 2021, pp. 5934–5938
11. T. Hayashi, W.-C. Huang, K. Kobayashi, and T. Toda, "Non-autoregressive sequence-to-sequence voice conversion," in *Proc. ICASSP*, 2021, pp. 7068–7072
12. Y.-W. Chen, K.-H. Hung, S.-Y. Chuang, J. Sherman, W.-C. Huang, X. Lu, and Y. Tsao, "Ema2s: An end-to-end multimodal articulatory-to-speech system," in *Proc. IEEE International Symposium on Circuits and Systems (ISCAS)*, 2021, pp. 1–5
13. Z. Yi, W.-C. Huang, X. Tian, J. Yamagishi, R. K. Das, T. Kinnunen, Z.-H. Ling, and T. Toda, "Voice Conversion Challenge 2020 – Intra-lingual semi-parallel and cross-lingual voice conversion –," in *Proc. Joint Workshop for the Blizzard Challenge and Voice Conversion Challenge 2020*, 2020, pp. 80–98
14. R. K. Das, T. Kinnunen, W.-C. Huang, Z.-H. Ling, J. Yamagishi, Z. Yi, X. Tian, and T. Toda, "Predictions of Subjective Ratings and Spoofing Assessments of Voice Conversion Challenge 2020 Submissions," in *Proc. Joint Workshop for the Blizzard Challenge and Voice Conversion Challenge 2020*, 2020, pp. 99–120
15. W.-C. Huang, T. Hayashi, S. Watanabe, and T. Toda, "The Sequence-to-Sequence Baseline for the Voice Conversion Challenge 2020: Cascading ASR and TTS," in *Proc. Joint Workshop for the Blizzard Challenge and Voice Conversion Challenge 2020*, 2020, pp. 160–164
16. W.-C. Huang, P. L. Tobing, Y.-C. Wu, K. Kobayashi, and T. Toda, "The NU Voice Conversion System for the Voice Conversion Challenge 2020: On the Effectiveness of Sequence-to-sequence Models and Autoregressive Neural Vocoders," in *Proc. Joint Workshop for the Blizzard Challenge and Voice Conversion Challenge 2020*, 2020, pp. 165–169
17. W.-C. Huang, T. Hayashi, Y.-C. Wu, H. Kameoka, and T. Toda, "Voice Transformer Network: Sequence-to-Sequence Voice Conversion Using Transformer with Text-to-Speech Pretraining," in *Proc. Interspeech*, 2020, pp. 4676–4680
18. W.-C. Huang, Y.-C. Wu, K. Kobayashi, Y.-H. Peng, H.-T. Hwang, P. Lumban Tobing, T. Toda, Y. Tsao, and H.-M. Wang, "Generalization of Spectrum Differential based Direct Waveform Modification for Voice Conversion," in *Proc. 10th ISCA Speech Synthesis Workshop*, 2019, pp. 57–62
19. W.-C. Huang, Y.-C. Wu, C.-C. Lo, P. Lumban Tobing, T. Hayashi, K. Kobayashi, T. Toda, Y. Tsao, and H.-M. Wang, "Investigation of F0 Conditioning and Fully Convolutional Networks in Variational Autoencoder Based Voice Conversion," in *Proc. Interspeech*, 2019, pp. 709–713
20. W.-C. Huang, Y.-C. Wu, H.-T. Hwang, P. Lumban Tobing, T. Hayashi, K. Kobayashi, T. Toda, Y. Tsao, and H.-M. Wang, "Refined WaveNet Vocoder for Variational Autoencoder Based Voice Conversion," in *Proc. 27th European Signal Processing Conference (EUSIPCO)*, Sep 2019
21. W.-C. Huang, H.-T. Hwang, Y.-H. Peng, Y. Tsao, and H.-M. Wang, "Voice conversion based on cross-domain features using variational auto encoders," in *Proc. The 11th International Symposium on Chinese Spoken Language Processing (ISCSLP)*, Nov 2018
22. C.-C. Lo, S.-W. Fu, W.-C. Huang, X. Wang, J. Yamagishi, Y. Tsao, and H.-M. Wang, "MOSNet: Deep Learning based Objective Assessment for Voice Conversion," in *Proc. Interspeech*, 2019, pp. 1541–1545

Domestic Conferences

1. W.-C. Huang, Y.-C. Wu, H.-T. Hwang, P. Lumban Tobing, T. Hayashi, K. Kobayashi, T. Toda, Y. Tsao, and H.-M. Wang, "Reducing mismatch of WaveNet vocoder for variational autoencoder

- based voice conversion,” in *ASJ*, Mar 2019
2. W.-C. Huang, C.-C. Lo, H.-T. Hwang, Y. Tsao, and H.-M. Wang, “Wavenet vocoder and its applications in voice conversion,” in *Proc. The 30th ROCLING Conference on Computational Linguistics and Speech Processing (ROCLING)*, Oct 2018

MISCELLANEOUS WORKS

Invited/visiting talks

1. W.-C. Huang ”Machine Reading Comprehension with Deep Learning”, National Taiwan University of Science and Technology, May. 2018

Open-source software development

1. ESPnet: End-to-end speech processing toolkit.
2. CRANK: Open-source software for nonparallel voice conversion based on vector-quantized variational autoencoder

SKILLS

Languages

Mandarin: native
English: fluent (TOEIC 960, TOEFL 108)
Japanese: intermediate (JLPT N2)

Programming languages

Python, shell script, Matlab, C++

Deep learning frameworks

PyTorch, TensorFlow, Chainer

Last updated: 2021/09/11