

Yun-Ning (Amy) Hung

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Education

- M.S. in Music Technology**, Georgia Institute of Technology, USA *Degree Expected 12/2021*
- Relevant courses: Audio Content Analysis, Machine Learning, Interactive Music
- B.S. in Electrical Engineering**, National Cheng Kung University (NCKU), Taiwan *2012 - 2016*
- UW-Madison Exchange Program**, University of Wisconsin-Madison, USA *Fall 2015*
- Relevant course: Software Engineering

Work Experience

- Research Engineer** at Bytedance *2022 - Present*
- Responsible for multitask learning framework for jointly learning multiple MIR tasks
- Research Intern** at Bytedance *2020 Summer*
- Building new machine learning system for music structure analysis, detection and segmentation.
 - Research on beat/downbeat detection by using transformer
- Audio Algorithm Intern** at Netflix *2020 Fall*
- Researched on automatic speech/music detection, and speech/music separation.
 - Building new large-scale datasets for TV shows' audio
- Research Assistant** at Georgia Institute of Technology *2019 - present*
- Researched on incorporating musical score with deep learning methods for the objective assessment of music performance.
- Research Intern** at Mitsubishi Electric Research Laboratories (MERL) *2020 Summer*
- Research on using adversarial training and musical score information for weakly-supervised music source separation.
- Research Assistant** at Academia Sinica, the National Academy of Taiwan *2017 - 2019*
- Researched on deep learning algorithm with Pytorch and Tensorflow for automatic music classification/auto-tagging, music transcription and music generation.
 - Presented at three conferences, several seminar talks, and one invited talk at the *6th Taiwanese Music and Audio Computing workshop*.
- Research Assistant** in the Industrial Collaboration program with KKBOX Inc *2017 - 2019*
- Collaborated with KKBOX's, the largest online music streaming company in Taiwan, on two projects: music recommendation and AI music creation.
 - Analyzed large-scale audio and lyrics dataset with Python framework. (Numpy, Scikit-learn, etc).
 - Researched on machine learning models to improve automatic music classification.
- Software Engineer Intern** at Amy.app, a New Zealand based online AI tutoring company *2019 Summer*
- Researched on machine learning methods with Python and Pytorch to automatically solve junior and senior high school math questions.
 - Developed typescript algorithm for multi-language feedback generation.

Languages

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| Machine Learning | Language: Python
Tools: PyTorch, Pytorch-lightning, TFLearn, Numpy, Scikit-learn, Matplotlib, Librosa |
| Web & Applications | Language: HTML, Javascript, CSS, Typescript, PHP, SQL, Java, Object-C
Tools: Ionic, Unity |
| Musical Tools | Sonic Visualiser, Max/MSP, FFmpeg |
| Others | Git, Linux, Latex |
| Spoken | Chinese (mother tongue), English (fluent), Taiwanese (listen), Spanish (read & listen) |

Academic Experience

Peer-reviewed Publications

- [1] **Hung, Y. N.**, Wang, J. C., Song, X., Lu, W. T., & Won, M., "Modeling Beats and Downbeats with a Time-Frequency Transformer", IEEE Int. Conf. Acoustics, Speech and Signal Processing (**ICASSP**), 2022.
- [2] Wang, J. C., **Hung, Y. N.**, & Smith, J. B. L., "To catch a chorus, verse, intro, or anything else: Analyzing a song with structural functions", IEEE Int. Conf. Acoustics, Speech and Signal Processing (**ICASSP**), 2022.
- [3] **Hung, Y. N.**, Wichern, G., & Roux, J. L., "Transcription Is All You Need: Learning to Separate Musical Mixtures with Score as Supervision.", IEEE Int. Conf. Acoustics, Speech and Signal Processing (**ICASSP**), 2021.
- [4] **Hung, Y. N.**, & Lerch, A., Multitask learning for instrument activation aware music source separation. International Society for Music Information Retrieval Conference (**ISMIR**), 2020 (*38% acceptance rate*)
- [5] Huang, J., **Hung, Y. N.**, Pati, A., Gururani, S. K., & Lerch, A., Score-informed Networks for Music Performance Assessment. International Society for Music Information Retrieval Conference (**ISMIR**), 2020
- [6] **Hung, Y. N.**, Chiang, I., Chen, Y. A., & Yang, Y. H., Musical Composition Style Transfer via Disentangled Timbre Representations. International Joint Conferences on Artificial Intelligence (**IJCAI**), 2019 (*17% acceptance rate*)
- [7] **Hung, Y. N.**, Chen, Y. A., & Yang, Y. H., Multitask learning for frame-level instrument recognition. IEEE Int. Conf. Acoustics, Speech and Signal Processing (**ICASSP**), 2019.
- [8] **Hung, Y. N.**, & Yang, Y. H., Frame-level Instrument Recognition by Timbre and Pitch. International Society for Music Information Retrieval Conference (**ISMIR**), 2018

Other Publications

- [9] **Hung, Y. N.**, Watcharasupat, K. N., Wu, C. W., Orife, I., Li, K., Seshadri, P., & Lee, J., AVASpeech-SMAD: A Strongly Labelled Speech and Music Activity Detection Dataset with Label Co-Occurrence. International Society for Music Information Retrieval Conference Late Breaking Demo, 2021
- [10] **Hung, Y. N.**, Chen, Y. A., & Yang, Y. H., Learning Disentangled Representations for Timber and Pitch in Music Audio, arXiv preprint arXiv: 1811.03271, Nov. 2018.
- [11] Yu, L. C., Yang, Y. H., **Hung, Y. N.**, & Chen, Y. A., Hit Song Prediction for Pop Music by Siamese CNN with Ranking Loss, arXiv preprint arXiv: 1710.10814, Oct. 2017.

Reviewed Journals

- IEEE International Conference on Multimedia & Expo, 2022
- IEEE Transactions on Audio, Speech and Language Processing, 2020-2021

Awards

Government Scholarship to Study Abroad , Ministry of Education, Taiwan	2020-2021
WIMIR Travel Grant , International Society for Music Information Retrieval Conference	2018
Study Abroad Scholarship , Electrical Engineering Department, National Cheng Kung University	Fall 2015
Academic Excellence Award (Top 10% students in the department), National Cheng Kung University	2013 - 2014

Projects

Music Source Separation (https://github.com/biboamy/Source_Separation_Inst)

2019 - present

Project in Music Technology Research Lab supervised by Prof. Alexander Lerch at Gatech

- Leverage my previous knowledge of instrument activation detection to build a deep learning model integrating source separation and instrument activation detection.

Animal Harmonizer (<https://biboamy.github.io/MIRProject/demoSite/paper.pdf>)

2019 Fall

Project in Audio Content Analysis course supervised by Prof. Alexander Lerch at Gatech

- Proposed a system to generate harmonization for a given melody line
- Research on pitch tracking, audio synthesis and music generation algorithm

Musical instrument recognition (<https://github.com/biboamy/IAD>)

2017 - 2019

Advised by Dr. Yi-Hsuan Yang, Academia Sinica. Collaborated with KKBOX Inc.

- Designed new model architectures to recognize instruments types and timing in music pieces.
- Proposed two deep learning models with multitask structure and harmonic-aware structure respectively, which improve the result (F-score) by 4%.
- Derived a large-scale synthesized dataset to address the small dataset issue.

Music Generation (<https://github.com/biboamy/instrument-disentangle>)

2017 - 2019

Advised by Dr. Yi-Hsuan Yang, Academia Sinica. Collaborated with KKBOX Inc.

- Designed deep learning architectures to generate music in different styles.
- Proposed two encoder-decoder models with adversarial training to disentangle musical features in high dimensional latent space.
- Analyzed latent space features by evaluating on auto-tagging, style transfer and cover song detection tasks.