

Yun-Ning (Amy) Hung

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Education

- M.S. in Music Technology**, Georgia Institute of Technology, USA *Degree Expected 05/21*
• 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 Intern** at Mitsubishi Electric Research Laboratories (MERL) *2019 - present*
• Research on using adversarial training and musical score information for weakly-supervised music source separation.
- 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 [1].
- 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 [7] 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.
• Provided technical reports and participated in weekly group brainstorming sessions.
- 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.
- App and Web Developer** at Adv.Media, an Asia-based mobile application company *2016 - 2017*
• Developed AR/VR applications and web platform for customers to display their products.
• Using Unity (C#), Android Studio (JAVA), and Xcode (Objective-C) to develop four applications, all of which were launched on both Google Play and the iOS App Store.
• Using PHP, SQL and Javascript to develop a web platform for managing user database.

Publications

Peer-reviewed Publications

- [1] **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*)
- [2] 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
- [3] **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*)
- [4] **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.
- [5] **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

- [6] **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.
- [7] 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.

Projects

Music Source Separation [2]

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.

Musical instrument recognition [3] [4] (<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 [5] [6] (<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.

BadgerScale (<https://biboamy.github.io/collection.html>)

2015 Fall

Course project in “Software Engineering” by Prof. Peter Ohmann at UW Madison

- Built an application for students to sell or buy sport tickets.
- Developed application front-end with Ionic framework.

Technical Skills

Machine Learning

Language: Python

Tools: PyTorch, TensorFlow, TFLearn, Numpy, Scikit-learn, Matplotlib, Librosa

Web & Applications

Language: HTML, Javascript, CSS, Typescript, PHP, SQL, Java, Object-C

Tools: Ionic, Unity

Others

Git, Linux, Latex

Instruments

Guitar (7 years), Piano (10 years), Flute (1 year)

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

Honorable Mention, Campus App Creativity Competition, National Cheng Kung University

Spring 2015

Academic Excellence Award (Top 10% students in the department), National Cheng Kung University

2013 - 2014

Academic Excellence Award, Taipei Association of Medical Technologists

2012 - 2016