Yun-Ning (Amy) Hung

Email: amyhung@gatech.edu | **LinkedIn**: yun-ning-hung | **Github**: biboamy | **Personal Web**: https://biboamy.github.io/

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 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 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 [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*