Yun-Ning (Amy) Hung

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Research focus: Machine Learning, deep learning, audio data analysis, music information retrieval

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*
- Research on machine learning methods to automatically assess students' music performances.
- Implement a Siamese model to handle multiple input features for predicting regression output.

Research Assistant at Academia Sinica, the National Academy of Taiwan *2017 - 2019*
- Conducted systematic research on automatic music classification/auto-tagging, music transcription and music generation problems.
- Designed deep learning algorithms/models with Pytorch and Tensorflow. (See projects below)
- Presented at three conferences, several seminar talks, and one invited talk at the *6th Taiwanese Music and Audio Computing workshop.*

Industrial Collaboration with KKBOX Inc, the largest online music streaming company in Taiwan *2017 - 2019*
- Collaborated with KKBOX's machine learning team to work on two projects: music recommendation [5] and AI music creation.
- Musical data analysis by using Python framework (numpy, scikit-learn, Matplotlib, etc).
- Provided technical report and participated in group brainstorming in a weekly basis.
- Improved music classification results (F-score) by more than 5%, resulting in more efficient

Software Engineer Intern at Amy.app, a New Zealand based online AI tutoring company *Summer 2019*
- Researched on machine learning algorithm to generate efficient feedback and math questions.
- Implemented machine learning models by using Python and Pytorch to automatically solve junior and senior high school math questions.

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.**, 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)***

[2] **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.

[3] **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

[4] **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.

[5] 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.

Project

Musical instrument recognition [1] [2] (https://github.com/biboamy/instrument-streaming) *2017 - 2019*
Advised by Dr. Yi-Hsuan Yang, Academia Sinica. Cooperated with KKBOX Inc.

- Designed new model architecture to recognize instruments types and usage 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%. Built by using Pytorch and Tensorflow.
- Derived a large-scale synthesized dataset to address the small dataset issue.

Music Generation [3] [4] (https://github.com/biboamy/instrument-disentangle) *2017 - 2019*
Advised by Dr. Yi-Hsuan Yang, Academia Sinica. Cooperated with KKBOX Inc.

- Design deep learning architecture to generate music in different styles.
- Proposed two encoder-decoder models with adversarial training to disentangle musical features in high dimensional latent space. Built by Pytorch.
- First model to realize musical instrumentation style transfer by using disentangled features.

BadgerScale (https://biboamy.github.io/collection.html) *2015 Fall*
Project done in course "Software Engineering" given by Prof. Peter Ohmann at UW Madison

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

Homework Discussion Social Media (https://biboamy.github.io/collection.html) *2014 Spring*
Project done in course "Web Programming" given by Prof. Chang Tien-Hao at NCKU

- Built a social media platform for students to exchange their notes, homework or publications
- Developed user-interface by using Javascript, HTML and CSS.

Awards

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*

Technical Skills

Web & Applications	HTML, Javascript, CSS, Ionic, Typescript, PHP, SQL, Unity, Java, Object-C
Machine Learning	Python, PyTorch, TensorFlow
Others	Git, Linux. Latex
Language	Mandarin Chinese (native speaker), English (fluent), Spanish (entry-level)
Instrument	Guitar (7 years), Piano (10 years), Flute (1 year)

Leadership

Student Startup *2015 - 2016*

- Co-organized two student startup companies for creating education software and tourist platform.
- Developed responsive web and application platforms for the orginizations.

Tutor and Mentor *2014 - 2016*

- As a personal science and mathematic academic coach for junior and senior high students.
- Student ambassador and Chinese tutor, Chinese Language Center, NCKU.
- Guitar club mentor at Tzu Chi Senior High School.

Vice president, National Cheng Kung University Guitar Club *2014 - 2015*

- Led an organization of 100+ people and co-organized several campus-wise musical events with 500+ audience.