

Hao-Wen (Herman) Dong

✉ salu.hwdong@gmail.com
🌐 salu133445.github.io
🔄 salu133445
🐦 salu133445
📄 hwdong

★ RESEARCH INTERESTS

Music generation, music information retrieval, machine learning, artificial intelligence

🎓 EDUCATION

University of California San Diego <i>Ph.D. in Computer Science (in progress)</i> Advisors: Prof. Julian McAuley and Prof. Taylor Berg-Kirkpatrick	Sep 2019–present La Jolla, CA, USA
University of California San Diego <i>M.S. in Computer Science</i>	Sep 2019–Jun 2021 La Jolla, CA, USA
National Taiwan Normal University <i>Digital Video and Audio Arts Program</i>	Sep 2016–Jun 2017 Taipei, Taiwan
National Taiwan University <i>B.S. in Electrical Engineering</i>	Sep 2013–Jun 2017 Taipei, Taiwan

📁 WORK EXPERIENCE

Dolby Laboratories <i>Deep Learning Audio Intern</i> Host: Applied AI Team, Advanced Technology Group Mentor: Cong Zhou	Jun 2021–present San Francisco, CA, USA
Yamaha Corporation <i>Research Intern</i> Host: AI Group, Research and Development Division Mentor: Keijiro Saino	May 2019–Aug 2019 Hamamatsu, Japan
Academia Sinica <i>Research Assistant</i> Host: Music and AI Lab, Research Center for IT Innovation Advisor: Dr. Yi-Hsuan Yang	Jul 2017–Apr 2019 Taipei, Taiwan

PROJECTS

Arranger – Automatic instrumentation for solo music using deep learning ★

 Apr 2020–present  University of California San Diego

- Approached automatic instrumentation by learning to separate parts (e.g. voices, instruments and tracks) from their mixture in multitrack music using LSTMs and Transformers
- Demonstrated the effectiveness of our proposed models through a comprehensive evaluation over four diverse datasets—Bach chorales, string quartets, game music and pop songs

MusPy – Open source Python library for music generation ★

 Mar 2020–Oct 2020  University of California San Diego

- Developed a toolkit that provides dataset management, data I/O, data preprocessing and model evaluation tools for developing a music generation system
- Conducted a statistical analysis and experiments on the 11 supported datasets to analyze their relative diversities and cross-dataset generalizabilities

DANTest – Understanding adversarial losses under a discriminative setting

 May 2018–May 2019  Academia Sinica

- Derived in theory what certain types of component functions lead to valid adversarial losses
- Proposed a framework for evaluating adversarial losses and compared the empirical performance of 12 component functions and 14 regularization approaches

Pypianoroll – Open source Python library for handling multitrack piano rolls

 May 2017–Oct 2018  Academia Sinica

- Developed an open source Python package for working with multitrack piano rolls that provides efficient I/O interfaces and tools for manipulating, visualizing and evaluating piano rolls

BinaryGAN – Modeling high-dimensional binary-valued data with GANs

 Mar 2018–Oct 2018  Academia Sinica

- Developed a generative adversarial network for high-dimensional binary-valued data that requires no post-processing and leads to better performance


BinaryMuseGAN – Advancing binarization strategy of MuseGAN

 Feb 2018–Sep 2018  Academia Sinica

- Improved the MuseGAN model by using binary neurons to generate binary-valued piano rolls
- Demonstrated the superiority of our proposed model over existing binarization approaches















MuseGAN – Generating multitrack music with convolutional GANs ★

 May 2017–Feb 2018  Academia Sinica


- Built the first deep neural network that can generate multitrack polyphonic music from scratch
- Extended the model to automatic music accompaniment for human-AI cooperative scenarios
- Compiled a large open dataset  consisting of 174,154 songs in multitrack piano roll format
- Proposed several objective metrics for evaluating machine-generated music

PUBLICATIONS









Conference Papers.....

- **Hao-Wen Dong**, Chris Donahue, Taylor Berg-Kirkpatrick, and Julian McAuley, “Towards Automatic Instrumentation by Learning to Separate Parts in Symbolic Multitrack Music,” *Proceedings of the 22nd International Society for Music Information Retrieval Conference (ISMIR)*, in press, 2021.   
- Sachinda Edirisooriya, **Hao-Wen Dong**, Julian McAuley, and Taylor Berg-Kirkpatrick, “An Empirical Evaluation of End-to-End Polyphonic Optical Music Recognition,” *Proceedings of the 22nd International Society for Music Information Retrieval Conference (ISMIR)*, in press, 2021.  
- **Hao-Wen Dong**, Ke Chen, Julian McAuley, and Taylor Berg-Kirkpatrick, “MusPy: A Toolkit for Symbolic Music Generation,” *Proceedings of the 21st International Society for Music Information Retrieval Conference (ISMIR)*, 2020.   
- **Hao-Wen Dong** and Yi-Hsuan Yang, “Convolutional Generative Adversarial Networks with Binary Neurons for Polyphonic Music Generation,” *Proceedings of the 19th International Society for Music Information Retrieval Conference (ISMIR)*, 2018.   
- **Hao-Wen Dong**^{*}, Wen-Yi Hsiao^{*}, Li-Chia Yang, and Yi-Hsuan Yang, “MuseGAN: Multi-Track Sequential Generative Adversarial Networks for Symbolic Music Generation and Accompaniment,” *Proceedings of the 32nd AAAI Conference on Artificial Intelligence (AAAI)*, 2018.   

Journal Paper.....

- Yin-Cheng Yeh, Wen-Yi Hsiao, Satoru Fukayama, Tetsuro Kitahara, Benjamin Genchel, Hao-Min Liu, **Hao-Wen Dong**, Yian Chen, Terence Leong, and Yi-Hsuan Yang, “Automatic Melody Harmonization with Triad Chords: A Comparative Study,” *Journal of New Music Research (JNMR)*, 50(1), 37–51, 2021. 



Nonrefereed Publications.....

- **Hao-Wen Dong** and Yi-Hsuan Yang, “Towards a Deeper Understanding of Adversarial Losses under a Discriminative Adversarial Network Setting,” *arXiv preprint arXiv:1901.08753*, 2019.  
- **Hao-Wen Dong** and Yi-Hsuan Yang, “Training Generative Adversarial Networks with Binary Neurons by End-to-end Backpropagation,” *arXiv preprint arXiv:1810.04714*, 2018.  
- **Hao-Wen Dong**, Wen-Yi Hsiao, and Yi-Hsuan Yang, “Pypianoroll: Open Source Python Package for Handling Multitrack Pianoroll,” *Late-Breaking Demos of the 19th International Society for Music Information Retrieval Conference (ISMIR)*, 2018.  
- Hao-Min Liu, **Hao-Wen Dong**, Wen-Yi Hsiao, and Yi-Hsuan Yang, “Lead sheet and Multi-track Piano-roll generation using MuseGAN,” *GPU Technology Conference Taiwan (GTC Taiwan)*, 2018. 
- **Hao-Wen Dong**^{*}, Wen-Yi Hsiao^{*}, Li-Chia Yang, and Yi-Hsuan Yang, “MuseGAN: Demonstration of a Convolutional GAN Based Model for Generating Multi-track Piano-rolls,” *Late-Breaking Demos of the 18th International Society for Music Information Retrieval Conference (ISMIR)*, 2017. 





(Note: ^{*} indicates equal contribution)

ACADEMIC TALKS

Tutorial Talk.....

- **Hao-Wen Dong** and Yi-Hsuan Yang, “Generating Music with GANs: An Overview and Case Studies,” *The 20th International Society for Music Information Retrieval Conference (ISMIR)*, Delft, The Netherlands, Nov. 4, 2019.  

Invited Talks.....

- **Hao-Wen Dong**, “MuseGAN: Multi-track Sequential Generative Adversarial Networks for Symbolic Music Generation and Accompaniment,” *Music AI Day at Academia Sinica*, Taipei, Taiwan, Jan. 3, 2019. 
- **Hao-Wen Dong**, “MuseGAN: Multi-track Sequential Generative Adversarial Networks for Symbolic Music Generation and Accompaniment,” *The 28th Generative Music Informatics Workshop*, Hiroshima, Japan, Aug. 20, 2018. 
- **Hao-Wen Dong**, “MuseGAN: Multi-track Sequential Generative Adversarial Networks for Symbolic Music Generation and Accompaniment,” *The 5th Taiwanese Music and Audio Computing Workshop*, Taipei, Taiwan, May 24, 2018. 
- **Hao-Wen Dong**, “MuseGAN: Multi-track Sequential Generative Adversarial Networks for Symbolic Music Generation and Accompaniment,” *AAAI Seminar (organized by Program Office of AI Research, Ministry of Science and Technology)*, Hsinchu, Taiwan, Mar. 24, 2018. 










TEACHING EXPERIENCE

Teaching Assistant , <i>Advanced Statistical NLP</i> , CSE 291, UC San Diego	Mar 2021–Jun 2021
Teaching Assistant , <i>Introduction to AI: A Statistical Approach</i> , CSE 151A, UC San Diego	Jan 2021–Mar 2021
TA Lead on Remote Teaching , <i>Web Mining and Recommender Systems</i> , CSE 258, UC San Diego	Oct 2020–Dec 2020

HONORS & AWARDS

J. Yang Scholarship , <i>J. Yang and Family Foundation</i>	(Sep 2021)–(Jun 2022)
Electrical and Computer Engineering Department Fellowship , <i>Department of Electrical and Computer Engineering, UC San Diego</i>	Sep 2019–Jun 2020
Delegate of Taiwan , <i>World Science Conference Israel</i>	Aug 2015
Summer Study Abroad Scholarship , <i>Jason International Charity Fund</i>	Aug 2013
Gold Medal in Physics, Prabowo Award (Highest Award in Physics) and Parliament of Central Kalimantan Award , <i>Asia Pacific Conference of Young Scientists</i>	Sep 2012
Finalist in Physics and Astronomy , <i>Intel International Science and Engineering Fair</i>	May 2012
First Award in Physics and Astronomy , <i>Taiwan International Science Fair</i>	Feb 2012
Gold Medal in International Division , <i>Canada-Wide Science Fair</i>	May 2010
Third Award in Mathematics , <i>Taiwan International Science Fair</i>	Feb 2010

MUSIC, FILMS & DRAMAS

Bass Singer , <i>NTUChorus</i>	Sep 2013–Jul 2017
Producer , “ <i>FragMemory</i> ”, short film, color, 39min 	Jun 2017
Conductor , <i>NTUEE Concert Choir</i> 	May 2017
Student Conductor , <i>NTUChorus</i>	Sep 2015–Aug 2016
Student Conductor , <i>NTUChorus Summer Concert</i> , Taiwan National Concert Hall  	Jul 2016
Student Conductor , <i>NTUChorus Winter Concert</i> , Taiwan National Concert Hall 	Jan 2016
Bass Leader , <i>NTUChorus</i>	Sep 2014–Jun 2015
Director and Writer , “ <i>Eye of Horus</i> ”, Sophomore Drama, NTUEE Night 	Mar 2015
Leading Actor , “ <i>The Magus</i> ”, Freshman Drama, NTUEE Night 	Mar 2014
Music Director , “ <i>Life is ____.</i> ”, Graduation album for NKNUSH Class of 2013 	Jun 2013
Writer, Vocal and Drums , “ <i>No longer ever</i> ”, Graduation song for NKNUSH Class of 2013 	Jun 2013