Jinhua Liang

Email：liangjh0903@gmail.com

Education Background

Queen Mary University of London **09/2021-Now**
Major: Electronic Engineering
Degree: Doctor of Philosophy

Tianjin University **09/2018-01/2021**
Major: Information and Communication Engineering
Degree: Master of Engineering

Tianjin University **09/2014-06/2018**
Major: Electronic Information Engineering
Degree: Bachelor of Engineering

Research Experiences

PhD stage (Supervised by Dr. Emmanouil Benetos, Dr. Huy Phan, and Prof. Mark Sandler) at Queen Mary University of London, United Kingdom

Everyday sound recognition with limited annotation

- To detect and classify types of everyday sounds in a recording or an online stream with limited labelled data.
- To explore few-shot learning technology in generic audio tagging
- To tackle multi-label few-shot problem with knowledge in audio taxonomy

MEng stage (Supervisor: Dr. Tao Zhang) at Tianjin University, China

Efficient convolution neural network (CNN) for mobile applications

- Research on the reduction of computational complexity and resource cost without much performance degradation.
- Investigated on how to reduce the feature redundancy in CNN architecture.
- Extracted feature representions for multimedia tasks, including acoustic scene classification, sound event detection, and image classification.

Detection and classification of acoustic scenes and events

- To recognize an audio scene or a sound event either from a recording or an on-line stream through pattern recognition and signal processing.
- Illustrated the relationship between the receptive field in a CNN and the time-frequency feature resolution in a mel energy spectrogram.
- Proposed a deep CNN architecture using fine resolution features.

Image recognition with system on chip (SoC)

- To classify the fruit categories in the captured image with TI AM5708.
- Responsible for the setup of deep learning environment, models comparison & selection, and model compression & optimization.
- Successfully classified 98 categories of fruits in a short duration.

Undergraduate stage at Tianjin University, China

Image denoising based on residual learning and batch normalization

- To recover images from Gaussian noise at unknown noise level.
- Mainly responsible for implementing various denoising methods for comparison.

Jinhua Liang

Email：liangjh0903@gmail.com

- Experimentally verified the effect of residual learning strategy and batch normalization for CNN denoising.

Research and development on 2-D sonar equipment based on beamforming

- To measure the distance and the depth of streambed ahead in real-time.
- Developed a suitable beamforming algorithm under the limitation of fixed arrays.
- Designed an underwater 2-D detection system using the vernier method.

Publications & Patents

Journals

** denotes the corresponding author*

- **Jinhua Liang**, Huy Phan, and Emmanouil Benetos. “LEARNING FROM TAXONOMY: MULTI-LABEL FEW-SHOT CLASSIFICATION FOR EVERYDAY SOUND RECOGNITION” (*in Peer Review*)
- **Liang, J.,** Phan, H., & Benetos, E. (2022). Leveraging Label Hierachies for Few-Shot Everyday Sound Recognition. Proceedings of the 7th Detection and Classification of Acoustic Scenes and Events 2022 Workshop (DCASE2022). Nancy, France.
- Li, R., **Liang, J.**, & Phan, H. (2022). Few-Shot Bioacoustic Event Detection: Enhanced Classifiers for Prototypical Networks. Proceedings of the 7th Detection and Classification of Acoustic Scenes and Events 2022 Workshop (DCASE2022). Nancy, France.
- Tao Zhang, **Jinhua Liang***, and Guoqing Feng. "Adaptive time-frequency feature resolution network for acoustic scene classification." **Applied Acoustics** 195 (2022): 108819.
- Tao Zhang, Shuang Li, Guoqing Feng, **Jinhua Liang***, Lun He, Xin Zhao. "Local channel transformation for efficient convolutional neural network." **Signal, Image and Video Processing (2022)**: 1-9.
- **Jinhua Liang**, Huy Phan, and Emmanouil Benetos. “Everyday Sound Recognition with Limited Annotations” **Digital Music Research Network** (DMRN +16), 2021.
- Zhang, T., Feng, G., **Liang, J.**, & An, T. (2021). “Acoustic scene classification based on Mel spectrogram decomposition and model merging,” in ***Applied Acoustics***, 182, 108258.
- **J. Liang**, T. Zhang* and G. Feng, "Channel Compression: Rethinking Information Redundancy Among Channels in CNN Architecture," in ***IEEE Access***, vol. 8, pp. 147265-147274, 2020, doi: 10.1109/ACCESS.2020.3015714.
- Tao Zhang, **Jinhua Liang***, and Biyun Ding, “Acoustic scene classification using deep cnn with fine-resolution feature”, ***Expert Systems with Applications***, vol. 143, pp. 113067, 2020.

Technical Report

- Ren Li, **Jinhua Liang**, Huy Phan. “FEW-SHOT BIOACOUSTIC EVENT DETECTION USING PROTOTYPICAL NETWORKS WITH RESNET CLASSIFIER”, DCASE2022 Challenge, June 2022.
- Guoqing Feng, **Jinhua Liang**, and Biyun Ding, “Acoustic Scene Classification Based on Lightweight CNN With Efficient Convolutions,” Tech. Rep., DCASE2020 Challenge, June 2020.
- Biyun Ding, Ganjun Liu, and **Jinhua Liang**, “Acoustic Scene Classification Based on Ensemble System,” Tech. Rep., DCASE2019 Challenge, June 2019.

Jinhua Liang

Email：liangjh0903@gmail.com

Scientific Research Project

AI for Everyday Sound Perception **2021-Now**

- The goal is to develop novel technologies in sound event detection and to extend them to several everyday-sound tasks, including audio tagging, acoustic scene classification, and audio captioning.

Research on efficient deep learning based ASC **2019-2020**

- The goal is to explore high-performance acoustic scene classification (ASC) technologies at a low computational cost.
- The major person in charge of the project.

Experimental & Computational skills

- Solid theoretical knowledge in the computational acoustics area
- Skillful in machine learning and neural network applications
- Excel in engineering and signal processing methods
- Skillful in Python, Matlab, Linux, and C++ programming

Awards & Honors

Scholarships

UK EPSRC Studentship **2021-Now**
China National Scholarship **2020**
The Fisrt Prize Academic Scholarship of Tianjin University **2019-2020**
The Second Prize Academic Scholarship of Tianjin University **2018**

Honors

Outstanding Graduate of Tianjin University **2020**
Merit Student of Tianjin University **2020**
Top 10 Outstanding Youth in Electrical and Information Engineering School **2020**
Outstanding Student Cadres of Tianjin University **2019**

Prizes

The Third Prize of the North China Division, the 14th China Graduate Electronic Design Competition **2019**

Others

DCASE 2022 Workshop Travel funds **2022**

Working and Teaching Experiences

Demonstrator of ECS423U (Engineering Maths, Employer: Emmanouil Benetos) **2022**
Demonstrator of ECS766P (Data Mining, Employer: Emmanouil Benetos) **2022**
Demonstrator of ECS7013P (Deep Learning for Audio & Music, Employer: Dr. Huy Phan) **2022**
Teaching Assistant of Digital Logic Circuit (Employer: Dr. Tao Zhang) **2020**

Jinhua Liang

Email：liangjh0903@gmail.com

Community Services

Reviewer for IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)
Reviewer for Detection and Classification of Acoustic Scenes and Events (DCASE)
Reviewer for Expert Systems with Applications
Reviewer for ACM Transactions on the Web
Reviewer for IEEE Access
Reviewer for Applied Acoustics