

Axiu Mao

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EDUCATION BACKGROUND

Ph.D.	City University of Hong Kong (CityU), Hong Kong Jockey Club College of Veterinary Medicine and Life Sciences Department of Infectious Diseases and Public Health GPA: 3.96/4.30 Supervisor: Prof. Kai Liu	Oct. 2019 – Oct. 2023
B.S.	China Jiliang University (CJLU), China College of Quality and Safty Engineering Quality Management Engineering GPA: 89.9/100 Rank: 1/81	Sep. 2015 - Jun. 2019

PROFESSIONAL EXPERIENCE

Part-time Research Assistant	Sep. 2021 – Sep. 2023 City University of Hong Kong, Hong Kong Jockey Club College of Veterinary Medicine and Life Sciences Department of Infectious Diseases and Public Health
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RESEARCH INTERESTS

Key words: deep learning, wearable sensors, computer vision, activity pattern recognition, acoustic detection, intelligent animal monitoring

Recently, I am interested in computer vision, multi-modal learning, image segmentation, and keypoint detection.

During Ph.D. period, I mainly focused on the applications of deep learning and wearable sensors in automated animal activity recognition and acoustic detection, aiming to construct intelligent animal monitoring systems.

PUBLICATIONS

Refereed Journal Articles

- [*ANIMALS*] FedAAR: A Novel Federated Learning Framework for Animal Activity Recognition with Wearable Sensors
Axiu Mao, Endai Huang, Haiming Gan, Kai Liu*
Animals, Aug, **2022**. [JCR Q1/SCI-IF: 3.231]
- [*J. R. Soc. Interface*] Automated Identification of Chicken Distress Vocalisations Using Deep Learning

Models

Axiu Mao, Claire S. E. Giraudet, Kai Liu*, Inês De Almeida Nolasco, Zhiqin Xie, Zhixun Xie, Yue Gao, James Theobald, Devaki Bhatta, Rebecca Stewart, and Alan G. McElligott*
Journal of the Royal Society Interface, Jun, **2022**. [JCR Q1/SCI-IF: 4.293]

3. [SENSORS] Cross-Modality Interaction Network for Equine Activity Recognition Using Imbalanced Multi-Modal Data
Axiu Mao, Endai Huang, Haiming Gan, Rebecca S. V. Parkes, Weitao Xu, Kai Liu*
Sensors, Sep, **2021**. [JCR Q2/SCI-IF: 3.847]
4. [COMPAG] Occlusion-Resistant Instance Segmentation of Piglets in Farrowing Pens Using Center Clustering Network
Endai Huang, **Axiu Mao**, Junhui Hou, Yongjian Wu, Weitao Xu, Maria Camila Ceballos, Thomas D. Parsons, Kai Liu*
Computers and Electronics in Agriculture, May, **2023**. [JCR Q1/SCI-IF: 6.757]
5. [COMPAG] Center Clustering Network Improves Piglet Counting Under Occlusion
Endai Huang, **Axiu Mao**, Haiming Gan, Maria Camila Ceballos, Thomas D. Parsons, Yueju Xue, Kai Liu*
Computers and Electronics in Agriculture, Oct, **2021**. [JCR Q1/SCI-IF: 6.757]
6. [COMPAG] A Semi-Supervised Generative Adversarial Network for Amodal Instance Segmentation of Piglets in Farrowing Pens
Endai Huang, Zheng He, **Axiu Mao**, Weitao Xu, Maria Camila Ceballos, Thomas D. Parsons, Kai Liu*
Computers and Electronics in Agriculture, Apr, **2023**. [JCR Q1/IF: 6.757]
7. [COMPAG] Automated Detection and Analysis of Piglet Suckling Behaviour Using High-accuracy Amodal Instance Segmentation
Haiming Gan, Mingqiang Ou, Chengpeng Li, Xiarui Wang, Jingfeng Guo, **Axiu Mao**, Maria Camila Ceballos, Thomas D. Parsons, Kai Liu*, Yueju Xue*
Computers and Electronics in Agriculture, Aug, **2022**. [JCR Q1/SCI-IF: 6.757]

Conference Proceedings

1. [USPLF'2023] Robust Animal Activity Recognition Using Wearable Sensors: A Correlation Distillation-based Information Recovery Method toward Data Having Low Sampling Rates
Axiu Mao, Endai Huang, Meilu Zhu, and Kai Liu*
The 2nd U.S. Precision Livestock Farming Conference (USPLF), May, **2023**.
2. [ECPLF'2022] Uniting farms: Federated Learning for Sensor-based Animal Activity Recognition
Axiu Mao, Endai Huang, Haiming Gan, and Kai Liu*
The 10th European Conference on Precision Livestock Farming (ECPLF), Aug, **2022**.
3. [ISAEW'2021] Cross-Modality Interaction Network for Equine Activity Recognition Using Time-Series Motion Data
Axiu Mao, Endai Huang, Weitao Xu, Kai Liu*
International Symposium on Animal Environment and Welfare (ISAEW), Oct, **2021**.
4. [USPLF'2023] Occlusion-resistant locomotion analysis of piglets using amodal instance segmentation

Haiming Gan, **Axiu Mao**, Cheryl Natalie Sze, Endai Huang, Maria Camila Ceballos, Thomas D. Parsons, Kai Liu*

The 2nd U.S. Precision Livestock Farming Conference (USPLF), May, 2023.

5. [ECPLF'2022] Occlusion Resistant Spatial Analysis of Pig Distribution Pattern in Farrowing Pens Using Center Clustering Network

Endai Huang, **Axiu Mao**, Haiming Gan, and Kai Liu*

The 10th European Conference on Precision Livestock Farming (ECPLF), Aug, 2022.

6. [ISAEW'2021] A Key Frame Selection Method for Creating Deep Learning Training Set in Animal Research Involving Time-Series Video Data

Endai Huang, **Axiu Mao**, Haiming Gan, Kai Liu*

International Symposium on Animal Environment and Welfare (ISAEW), Oct, 2021.

7. [ASABE'2021] Capacity Limit of Deep Learning Methods on Scenarios of Pigs in Farrowing Pen under Occlusion

Endai Huang, **Axiu Mao**, Maria Camila Ceballos, Thomas D. Parsons, Kai Liu*

ASABE Annual International Virtual Meeting (ASABE), Jul, 2021.

8. [ACPLF'2020] Deep Learning-based Assessment of Laying-hen Feather Conditions Using Color and Thermal Images

Endai Huang, **Axiu Mao**, Kai Liu*, Yueju, Xue

The 2nd Asian Conference on Precision Livestock Farming (ACPLF), Oct, 2020.

Under-Review Manuscripts

1. A Teacher-to-Student Information Recovery Method Toward Energy-Efficient Animal Activity Recognition at Low Sampling Rates

Axiu Mao, Meilu Zhu, Endai Huang, Kai Liu*

Submitted to Computers and Electronics in Agriculture (COMPAG), 2023.

2. Deep Learning-based Animal Activity Recognition with Wearable Sensors: Overview, Challenges, and Future Directions

Axiu Mao, Endai Huang, Kai Liu*

Submitted to Computers and Electronics in Agriculture (COMPAG), 2023.

Preprints

1. Effectiveness of quarantine measure on transmission dynamics of COVID-19 in Hong Kong

Hsiang-Yu Yuan*, **Axiu Mao**, Guiyuan Han, Hsiangkuo Yuan, Dirk Pfeiffer

medRxiv, <https://www.medrxiv.org/content/10.1101/2020.04.09.20059006v1>, 2020.

2. The importance of the timing of quarantine measures before symptom onset to prevent COVID-19 outbreaks-illustrated by Hong Kong's intervention model

Hsiang-Yu Yuan*, Guiyuan Han, Hsiangkuo Yuan, Susanne Pfeiffer, **Axiu Mao**, Lindsey Wu, Dirk Pfeiffer

medRxiv, <https://www.medrxiv.org/content/10.1101/2020.05.03.20089482v1>, 2020.

SELECTED AWARDS

- Silver Award of The 8th China International College Students' 'Internet +' Innovation and Entrepreneurship Competition, International Nov. 2022
- Key Words: WeKnow Tech: Solution for Intelligent Animal Monitoring
- Research Tuition Scholarship (RTS), CityU Sep.2022
- Outstanding Graduate Student Paper and Presentation Award at ISAEW'2021, Chongqing, China Oct. 2021
- Outstanding Graduates, Zhejiang Province Jun. 2019
- Meritorious Winner, Mathematical Contest in Modeling (MCM), International May. 2018
- Key Words: HF radio, Reflection Loss Model, Signal-to-noise Ratio
- The First Prize, National Mathematical Modeling Competition, Zhejiang Area Oct. 2017
- Key Words: CT System Parameter and Imaging
- The First Prize, National Mathematics Competition Nov. 2018
- The First Prize, Higher Mathematics Competition (Calculus), Zhejiang Province Oct. 2018
- The First Prize, Physics Innovation Competition (Theory), Zhejiang Province Jan. 2018
- Outstanding Graduates, CJLU Jun. 2019
- The First Prize, Hexagon Technology Public Benefit Scholarship (only one), CJLU Mar. 2019
- The First Prize, Challenge Cup College Students Entrepreneurship Competition, CJLU Jan.2018
- Key Words: RFID, Information Traceability System
- First-class Student Award, CJLU 2015-2018

PROFESSIONAL ACTIVITIES

Journal Reviewers

- Expert Systems With Applications (ESWA)
- Computers and Electronics in Agriculture (COMPAG)
- Information Processing in Agriculture (IPA)
- Patterns – Cell Press
- PeerJ

Conference Reviewers

- USPLF'2023, Tennessee, United States

Conference Presentations

- USPLF'2023, Tennessee, United States May. 2023
- ECPLF'2022, Vienna, Austria Aug. 2022
- ISAEW'2021, Chongqing, China Oct. 2021