# Axiu Mao

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## *EDUCATION BACKGROUND*

**Ph.D.** City University of Hong Kong, Hong Kong — Oct. 2019 - Present
Jockey Club College of Veterinary Medicine and Life Sciences
Department of Infectious Diseases and Public Health | GPA: 3.96/4.30
Supervisor: Dr. Kai Liu

**B.S.** China Jiliang University, China — Sep. 2015 - Jun. 2019
College of Quality and Safty Engineering
Quality Management Engineering | GPA: 3.99/5.00

## *PROFESSIONAL EXPERIENCE*

**PT-RA** City University of Hong Kong, Hong Kong — Sep. 2021 - Present
Jockey Club College of Veterinary Medicine and Life Sciences
Department of Infectious Diseases and Public Health

## *RESEARCH INTERESTS*

Animal Activity Recognition (AAR), Sound Detection, Animal Welfare, Machine Learning, Deep Learning, Wearable Sensors, Internet of Things (IoT)

## *PUBLICATIONS*

### Refereed Journal Articles

1. [*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**.*

2. [*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**.*

3. [*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**.*

4. [*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**.*

5. [*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**.*

**Conference Proceedings**

1. [*ECPLF'2022*] Uniting farms: Federated learning for sensor-based animal activity recognition
**Axiu Mao**, Endai Huang, Haiming Gan, and Kai Liu*
*10th European Conference on Precision Livestock Farming (ECPLF), Aug, **2022**.*

2. [*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*
*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. [*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**.*

5. [*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**.*

6. [*ACPLF'*2020] Deep Learning-based Assessment of Laying-hen Feather Conditions Using Color and Thermal Images
Endai Huang, **Axiu Mao**, Kai Liu*, Yueju, Xue
*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*
Submit to *Expert Systems With Applications (ESWA), http://dx.doi.org/10.2139/ssrn.4288774, **2022***.

2. Occlusion-Resistant Instance Segmentation of Piglets in Farrowing Pens Using Center Clustering Network
   Endai Huang, **Axiu Mao**, Yongjian Wu, Haiming Gan, Maria Camila Ceballos, Thomas D. Parsons, Junhui Hou, Kai Liu*
   *Submit to Computers and Electronics in Agriculture (COMPAG), https://arxiv.org/abs/2206.01942,* ***2022****.*

3. 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*
   *Submit to Computers and Electronics in Agriculture (COMPAG), Major revision, http://dx.doi.org/10.2139/ssrn.4267818,* ***2022****.*

**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****.*

## *AWARDS AND HONORS*

- Research Tuition Scholarship (RTS), City University of Hong Kong Sep.2022
- Outstanding Graduate Student Paper and Presentation Award at 2021 International Symposium on Animal Environment and Welfare, Chongqing, China Oct. 2021
- Outstanding Graduates of Zhejiang Province Jun. 2019
- Meritorious Winner, Mathematical Contest in Modeling (MCM) May. 2018

## *PROFESSIONAL ACTIVITIES*

**Journal/Conference Reviewers**

- Expert Systems With Applications (ESWA)
- Computers and Electronics in Agriculture (COMPAG)
- Information Processing in Agriculture (IPA)
- PeerJ
- USPLF2023

**Conference Presentations**

- ECPLF 2022 Aug. 2022
- ISAEW 2021 Oct. 2021