

## RESEARCH INTERESTS

---

Advancing machine listening: understanding acoustic scenes and events and the emotions they evoke. Topics include: computational auditory scene analysis, environmental sound detection and affective computing, audio-visual scene and event recognition, bioacoustic monitoring and analysis, LLM-based automated soundscape affective analysis, and enhancing robot intelligibility through sounds.

## ACADEMIC APPOINTMENTS

---

<b>Post-doctoral Researcher, Machine Learning Research Group (MLRG)</b> <i>Department of Engineering Science, University of Oxford, UK</i> Supervisor: Prof. Stephen Roberts (Engineering), Prof. Kathy Willis (Biology)	Dec. 2024 — Present
<b>Post-doctoral Researcher</b> <i>WAVES Research Group, FEA, Ghent University, Belgium</i> Supervisor: Prof. Dick Botteldooren	Oct. 2024 — Dec. 2024
<b>Honorary Research Assistant</b> <i>The Bartlett School of Environment, Energy and Resources, University College London (UCL), UK</i> Supervisor: Prof. Jian Kang	Nov. 2022 — Mar. 2023

## EDUCATION

---

<b>Full scholarship Ph.D. in Computer Science Engineering</b> <i>WAVES Research Group, Faculty of Engineering and Architecture (FEA), Ghent University, Belgium</i> Supervisor: Prof. Dick Botteldooren	Oct. 2020 — Sep. 2024
<b>Master of Electronics Science and Technology</b> <i>Beijing University of Posts and Telecommunications (BUPT), China</i> Supervisor: Prof. Shengchen Li, Prof. Ming Liu	Sept. 2016 — Jun. 2020

## AWARDS & SCHOLARSHIPS

---

• <b>Chinese Government Award for Outstanding Self-financed Students Abroad</b> (The <b>highest honor</b> bestowed by the Ministry of Education (China) on Chinese students studying abroad. Recipients are chosen worldwide among all Chinese overseas graduate students for their outstanding accomplishments in academia; only up to 600 are awarded each year.)	July. 2024
• <b>China National Scholarship</b> (The <b>highest honor</b> bestowed by the Ministry of Education (China) on Chinese students.)	Oct. 2014
• <b>BUPT Honorary Scholarship</b>	Feb. 2019
• <b>BUPT Scholarship for Postgraduate Studies</b>	Oct. 2016; Oct. 2017; Oct. 2018

## TEACHING & SUPERVISION

---

<b>Course Tutor</b> <i>Department of Computer Science, University of Oxford, Oxford, UK</i>	Oct. 2025
• <b>Course:</b> Machine Learning (2025/2026). • <b>Responsibilities:</b> Small class tutorial teaching, in groups of about 15 to 20 students. Mark students' work, holding tutorials and Q&A for each group of students, and provide reports to colleges on the work undertaken by the students. Set and mark collections (mock exams) and deliver a revision class before the exams.	
<b>Teaching Assistant</b>	

1. <i>Department of Computer Science, University of Oxford, Oxford, UK</i>	2025 and 2026
• <b>Course:</b> Uncertainty in Deep Learning (2024/2025) and (2025/2026).	
• <b>Responsibilities:</b> marking individual course projects for undergraduate, master's, and PhD students.	
2. <i>Beijing University of Posts and Telecommunications (BUPT), China</i>	2018
• <b>Course:</b> Pattern Recognition and Machine Learning	
• <b>Responsibilities:</b> marking undergraduate students' coursework.	

#### Supervisor

1. <i>Department of Computer Science, University of Oxford, Oxford, UK</i>	2025
• Supervised undergraduate projects and summer interns.	
• <b>Responsibilities:</b> propose research topics, guide research plans, improve experimental designs, discuss analysis and demonstration of results.	
2. <i>Department of Computer Science, University of Oxford, Oxford, UK</i>	2025
• <b>Master's thesis:</b> Machine Learning to Detect Invasive Species.	
• <b>Responsibilities:</b> guide research plans, improve experimental designs, and discuss analysis and demonstration of results.	
3. <i>Master of Science in Computer Science, Ghent University, Belgium</i>	2024
• <b>Master's thesis:</b> Enhancing Environmental Sound Classification and Dataset Annotation Through <b>Geospatial Data</b> Analysis with Large Language Models.	
• <b>Responsibilities:</b> propose research topics, formulate research questions, guide research plans, improve experimental designs, discuss analysis and demonstration of results, supervise and review academic writing, and develop skills in presentation.	
4. <i>Master of Information Engineering Technology, Ghent University, Belgium</i>	2024
• <b>Master's thesis:</b> Audio-based Environmental Monitoring for Edge Devices.	
• <b>Responsibilities:</b> propose research topics, formulate research questions, guide research plans, improve experimental designs, discuss analysis and demonstration of results, supervise and review academic writing, and develop skills in presentation.	

#### PROFESSIONAL EXPERIENCE (INDUSTRY INTERNSHIPS)

<b>Research intern at Speech Research Group, Supervisor: Prof. Frank K. Soong</b>	Jul. 2018 – Jun. 2019
<i>Microsoft Research Asia (MSRA)</i>	<i>Beijing, China</i>
• Singing voice detection for Xiaolce AI	
• 1 patent (OBTAINING A SINGING VOICE DETECTION MODEL, patent ID: CN112309428A) + INTERSPEECH 2020 paper	
<b>Research intern at Music Research Group, Supervisor: Dr. Bilei Zhu</b>	Nov. 2019 – Oct. 2020
<i>ByteDance AI Lab</i>	<i>Shanghai, China</i>
• Audio-visual singing voice detection in live musical streams This internship explores the feasibility of in live video streams.	
• ICASSP 2021 + INTERSPEECH 2021 papers	

#### SELECTED PUBLICATIONS

[GOOGLE SCHOLAR](#)

##### *Journals*

- IEEE Transactions on Multimedia (IEEE TMM)**  
Y. Hou, Q. Ren, A. Mitchell, W. Wang, J. Kang, T. Belpaeme, D. Botteldooren, "Soundscape captioning using sound affective quality network and large language model".
- IEEE/ACM transactions on audio, speech, and language processing (IEEE/ACM TASLP)**  
Y. Hou, B Kang, A Mitchell, W Wang, J Kang, D Botteldooren, "Cooperative Scene-Event Modelling for Acoustic Scene Classification".
- IEEE Signal Processing Letters (IEEE SPL)**  
Y. Hou, S Song, C Yu, W Wang, D Botteldooren, "Audio Event-Relational Graph Representation Learning for Acoustic Scene Classification".

4. **The Journal of the Acoustical Society of America (JASA)**  
**Y. Hou**, Q Ren, H Zhang, A Mitchell, F Aletta, J Kang, D Botteldooren, "AI-based soundscape analysis: Jointly identifying sound sources and predicting annoyance".
5. **IEEE Robotics and Automation Letters (IEEE RA-L)**  
Q Ren, **Y. Hou**, D Botteldooren, T Belpaeme, "No More Mumbles: Enhancing Robot Intelligibility Through Speech Adaptation".
6. **IEEE Signal Processing Letters (IEEE SPL)**  
Z Liu, **Y. Hou**, W. Wang, S. Michiels, D. Hughes, "SCAN: Selective Contrastive Learning Against Noisy Data for Acoustic Anomaly Detection".
7. **Sensors**: Q Ren, **Y. Hou**, D Botteldooren, T Belpaeme, "Behavioural Models of Risk-Taking in Human-Robot Tactile Interactions".
8. **Applied Acoustics**: J. Xie, J. Kang, Z. Zhao, **Y. Hou**, "Effects of audiovisual information and its perception on the sense of culture in everyday heritage"
9. **Poultry Science**: P. Soster, T. Grzywalski, **Y. Hou**, P. Thomas, A. Dedeurwaerder, M. Gussem, F. Tuyttens, P. Devos, D. Botteldooren, G. Antonissen, "Automated detection of broiler vocalizations a machine learning approach for broiler chicken vocalization monitoring"
10. **Poultry Science**: T. Grzywalski, P. Soster, **Y. Hou**, P. Thomas, F. Tuyttens, A. Dedeurwaerder, M. Gussem, P. Devos, G. Antonissen, D. Botteldooren, "Identification and Characterization of Clusters of Potentially New Vocalizations in Broiler Chickens Using Advanced Acoustic Analysis"

#### *Conferences*

1. **IEEE ICASSP 2025**: **Y. Hou**, Q Ren, Y Song, W Wang, & D. Botteldooren, "Sound-Based Recognition of Touch Gestures and Emotions for Enhanced Human-Robot Interaction".
2. **IEEE ICASSP 2024**: **Y. Hou**, Q Ren, S Song, Y Song, W Wang, & D. Botteldooren, "Multi-level graph learning for audio event classification and human-perceived annoyance rating prediction".
3. **AAAI 2024**: Q Lin, C Luo, Z Niu, X He, W Xie, **Y. Hou**, L Shen, S Song, "Boosting Adversarial Transferability across Model Genus by Deformation-Constrained Warping".
4. **IEEE ICASSP 2023**: **Y. Hou**, Y. Wang, W. Wang, D. Botteldooren, "GCT: Gated Contextual Transformer for Sequential Audio Tagging".
5. **INTERSPEECH 2023**: **Y. Hou**, S Song, C Luo, A Mitchell, Q Ren, W Xie, J Kang, W Wang, D. Botteldooren, "Joint Prediction of Audio Event and Annoyance Rating in an Urban Soundscape by Hierarchical Graph Representation Learning".
6. **ACM/IEEE HRI 2023**: Q Ren, **Y. Hou**, T. Belpaeme, "Low-latency Classification of Social Haptic Gestures Using Transformers".
7. **ICONIP 2023**: Z Liu, **Y. Hou**, H Tang, Á López-Chilet, S Michiels, D Botteldooren, "CLF-AIAD: A Contrastive Learning Framework for Acoustic Industrial Anomaly Detection".
8. **IEEE MMSP 2022**: **Y. Hou**, B. Kang & D. Botteldooren, "Audio-visual scene classification via contrastive event-object alignment and semantic-based fusion".
9. **INTERSPEECH 2022**: **Y. Hou**, Z. Liu, B. Kang, Y. Wang & D. Botteldooren, "CT-SAT: Contextual Transformer for Sequential Audio Tagging".
10. **INTERSPEECH 2022**: **Y. Hou**, & D. Botteldooren, "Event-related data conditioning for acoustic event classification".
11. **IJCNN 2022**: **Y. Hou**, B. Kang, W. Hauwermeiren, & D. Botteldooren, "Relation-guided acoustic scene classification aided with event embeddings".
12. **IEEE ICASSP 2021**: **Y. Hou**, Y. Deng, B. Zhu, Z. Ma, & D. Botteldooren, "Rule-embedded network for audio-visual voice activity detection in live musical video streams".
13. **INTERSPEECH 2021**: **Y. Hou**, Z. Yu, X. Liang, X. Du, B. Zhu, Z. Ma, & D. Botteldooren, "Attention-based cross-modal fusion for audio-visual voice activity detection in musical video streams".

## ACADEMIC SERVICES

---

### Journal reviewer

- IEEE/ACM Transactions on Audio Speech and Language Processing (TASLP)
- EURASIP Journal on Audio, Speech, and Music Processing (JASM)
- IEEE Internet of Things Journal (IoT)
- IEEE Transactions on Systems, Man, and Cybernetics: Systems (SMC: Systems)
- Journal of the Acoustical Society of America (JASA)
- Computers, Environment and Urban Systems (CEUS)
- Signal, Image and Video Processing
- Landscape and Urban Planning

### Conference reviewer

- IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)
- Conference of the International Speech Communication Association (INTERSPEECH)
- IEEE International Workshop on Machine Learning for Signal Processing (MLSP)
- IEEE International Joint Conference on Neural Networks (IJCNN)
- IEEE Conference on Artificial Intelligence (IEEE CAI)
- International Conference on Neural Information Processing (ICONIP)
- ACII Workshop on Affective Human-Robot Interaction (AHRI)
- National Conference on Man-Machine Speech Communication (NCMSC)

## INVITED TALKS

---

1. Topic: **Deep learning-based Soundscape research and analysis** Dec. 2024  
Organizer: Harbin Institute of Technology, Shenzhen, China
2. Topic: **Understanding Acoustic Scenes and Events and the Emotions They Evoke** Oct. 2024  
Organizer: China Electronic Audio Industry Association

## INTERVIEW

---

1. [Unlocking the World of Sounds: Machines that Hear and Feel](#) Dec. 2024  
Ghent University
2. [Chinese Government Award for Outstanding Self-financed Students Abroad \(A Category\)](#)  
[Education Section of the Embassy of the People's Republic of China in the Kingdom of Belgium](#)  
Sept. 2024