Xingxin Yang, MSc

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IELTS:6.5 Scholar Youtube
Supervisor: Prof. Lingxi Peng
Objective: Apply for a **Ph.D.** (2025)
Interest: **AI-based Interdisciplinary Area**

1. Overview

Guangzhou University Master, GPA 88/100, IELTS 6.5. Published 4 papers(iF36) with one as first author in a Top Journal, 3 patents(1st inventor). Earned 7 scholarships, 3 honors, 4 national contest prizes. Led 3 AI projects. Two visits, including to the University of Washington(USA). Committed to innovation, determination, diligence.
click: Scholarships Contests Project Skills Motivation

2. Education

2020.9–2023.6 **M.Sc. Guangzhou University, China. GPA:88/100.**
Major: Signal and Information Processing.
Thesis: *Research on Discharge Gap State of HS-WEDM Based on Deep Learning*(Grade A)
Subjects: Modern Digital Signal Processing, Stochastic Process, Pattern Recognition, Convex Optimization Theory, etc.

2016.9–2020.6 **B.Sc. Guangzhou University, China. GPA:84/100.**
Exempted from Exam for Postgraduate Admission (Overall/Rank:85.3/2)
Major: Electrical Engineering and Automation.
Thesis: *Automated Garbage Sorting System using Deep Learning.*(Best Thesis Award)
Certificates: CET4, CET6, Computer Third-Level.
Subjects: Higher Mathematics, Linear Algebra, Probability and Mathematical Statistics.

3. Research Achievements (Seven)

Publications

1. **(JCR Q1-Top, IF12.1)**, **Xingxin Yang(1st)**, C. Liu, *et al.*, "A new BRTCN model for predicting discharge status of WEDM based on acoustic emission," *Journal of Manufacturing Systems*, vol. 64, pp. 409–423, 2022, ISSN: 0278-6125. DOI: https://doi.org/10.1016/j.jmsy.2022.07.003.
2. **(JCR Q2, IF3.4)**, C. Liu, **Xingxin Yang(2nd)**, *et al.*, "Spark analysis based on the CNN-GRU model for WEDM process," *Micromachines*, vol. 12, no. 6, 2021, ISSN: 2072-666X. DOI: 10.3390/mi12060702.
3. **(nature comm, IF16.6)**, J. Cheng, **Xingxin Yang(8th)**, *et al.*, "Centrifugal multimaterial 3d printing of multifunctional heterogeneous objects," *Nature Communications*, vol. 13, no. 7931, 2022, ISSN: 2041-1723. DOI: 10.1038/s41467-022-35622-6.
4. **(JCR Q2, IF3.9)**, C. Liu, **Xingxin Yang(3rd)**, *et al.*, "A domestic trash detection model based on improved yolox," *Sensors*, vol. 22, no. 18, 2022, ISSN: 1424-8220. DOI: 10.3390/s22186974.

Patents(List the top 3/40)

1. *Authorization of invention patent: An evolutionary learning method, device, system and medium for garbage recognition based on deep learning, CN109389161B.*
2. *Software registration: Automatic garbage sorting and recycling system control software based on multi-sensor fusion evolutionary learning, 2019SR0664802.*
3. *PCT: Bag breaking apparatus for waste bag, PCT/CN2020/120512.*

4. Scholarships and Honors (Ten)

2021 **National Scholarship** (postgraduate, top 73/7300 at the university)
2022 **First class** of Academic Scholarship (postgraduate, top 10% students of the institute)
2021 **First class** of Academic Scholarship (postgraduate, top 10% students of the institute)
2020 **First class** of Academic Scholarship (postgraduate, top 10% students of the institute)
Scholarship for Enrolled Graduate Students Recommended for Admission
2019 **Second class** of Academic Scholarship (undergraduate)
Research Achiever Honor Title (undergraduate)
Innovation Maestro Honor Title (undergraduate)
Top Ten Personal Honor for Strong Developmental Competence (undergraduate)
2018 **First class** of Academic Scholarship (undergraduate)

5. Contests and Visiting (Six)

(2020, Project leader) **First Prize** of China's 15th Graduate Electronic Design Contest

(2019, Project leader) **First Prize** of China's 16th "Challenge Cup" Undergraduate Student Curricular Academic Science and Technology Works Contest

Third Prize of China's 12th Undergraduate Student Social Practice and Science and Technology Competition on Energy Conservation and Emission Reduction

(2017, Project leader) **Second Prize** of China's Robot Contest

(2018, Member) **International Program** of AI robot design at University of Washington, USA. Obtained a 10-year US visa(2018-2028).

Visiting student, Nanjing University of Aeronautics and Astronautics, China.

6. Project Experience (Three)

6.1 Acoustic-optic signal analysis based on deep learning for monitoring discharge status during WEDM process *Core Member* 2020–2023

Source/Funded:National Natural Science Foundation of China (NSFC), ID:51275098 & Guangzhou Science and Technology Project, ID:202102010392

Primary work: Monitoring WEDM discharge status using dual-channel Acoustic Emission (AE) sensors and a high-speed CCD camera. Introduced a novel Batch Relevance Temporal Convolution Neural Network (BRTCN) to decouple dual-channel AE signals, establishing a relationship for machining state analysis. Utilized a 3D feature space formed by CNN-extracted spark image features to predict discharge status through GRU.

In the CNN-GRU and BRTCN papers, my contributions include: 1) Pioneering monitoring methods from the perspectives of AE and spark images. 2) Establishment of the hardware platform. 3) Synchronization of multi-sensor data acquisition. 4) Development of a preprocessing method for handling labeled data imbalance. 5) Independent design of deep learning network architecture, including CNN-GRU and BRTCN. 6) Experimental validation of model efficiency. 7) Paper writing. 8) Revision and response to reviews.

Keywords: BRTCN; CNN; GRU; 3D feature; Multi-sensor

6. Project Experience (Three) (continued)

6.2 AI Garbage Classification System *Project Leader* 2017–2019

First Prizes of China's 16th "Challenge Cup and Electronic Design Competition

To aid in garbage sorting and recycling, we designed a physical system based on an improved SSD deep learning object detection algorithm to classify eight types of daily waste. To enhance model generalization, we gathered 10,000 real-world garbage samples, applying image segmentation, poisson fusion, and internet data for augmentation. We deployed the detection algorithm and created an STM32-based multi-sensor fusion garbage classification system for real-time and accurate results. This interdisciplinary project, spanning deep learning, automation, circuits, mechanics, and more, achieved significant breakthroughs, securing competition awards and patents.

Later, in 2019, my partner and I established a startup company, securing an initial funding of about $14000. However, due to the unfavorable pandemic situation, the startup company folded.

Keywords: Image Segmentation; Object Detection; Feature Detection; Poisson Blending; STM32

6.3 Target searching robot under the Raspberry Pi 3B+ platform *Project Leader* 2017

Second Prize of China's Robot Contest

We developed a salience object recognition algorithm based on stem-leaf graph statistics according the actual environment. The algorithm had good anti-interference and fast running speed. And Our team won the first national award since college.

Keywords: Target Searching; Robot; Regularization; Stem-leaf Graph Statistics

7. Other Experience

RA Experience *Research Assistant* 2023.11-now

Prof. Jie M. Zhang, Department of Informatics, King's College London, UK

Research Project Fairness of sentiment classification model

Large language model for code generation and analysis

Teaching Experience For PhD Application Gap *Assistant Teacher* 2023.6-2024.06

College of Artificial Intelligence, Neusoft Institute Guangdong, China

Guided Project: Brain-Computer Interface for Car Control

Teaching Subject: Digital Signal Processing

Academic Cooperation *Technical Assistance* 2020.6-2023.12

Project 1 (Manufacturing, Guangzhou University): Thesis work guidance for paper called "A new workpiece height estimation method based on *** signals for *** WEDM", will publish soon.

Project 2 (Materials, The Hong Kong Polytechnic University): High-precision temperature sensor reading for self-developed NTC resistors. Mainly involved in the development of ADC circuits, embedded reading programs, Kalman filtering algorithm, and third-order exponential correction algorithm. Achieved a temperature reading range of -273°C to 200°C with an accuracy of 0.01°C.

Project 3 (Materials, Beijing University of Aeronautics and Astronautics, China 985/211): Measurement of temperature, voltage, and current for 80 sets of 18650 batteries, along with their series-parallel control. Main responsibilities include the development of isolated ADC measurement circuits, data reading programs, low-pass filter design, CAN bus communication, and the development of control and data management upper-computer programs, etc.

8. Skills and Qualifications

Coding	Python, C/C++, Matlab, NI-Labview
Framework	Pytorch, Keras, Opencv, Openpose, ROS, PyQt, MySQL

8. Skills and Qualifications (continued)

Software	Ubuntu, Vscode, Git, Docker, Origin, Latex, Endnote, Keil-ARM, Solidwork, PS, PR, CE
HomeLab	GPU(Titan RTX 24G), 3D Printer(Bamboo x1cc), SMT Machine, DAQ-NI6366, etc.
Hobbies	DIY, Design, Table tennis, Badminton, Roller skating, Cooking, Singing, Photography.
Strengths	Many ideas, Interdisciplinary, Responsible, Ambitious, Self-Driven, Adaptable, Outgoing.

9. Motivation Letter

My name is Xingxin Yang, obtained a master degree in July 2023 from Guangzhou University in China. I seek the opportunity to express my keen interest in pursuing a **doctoral study** in the **interdisciplinary area based on deep learning**. To demonstrate my suitability for this field, I would like to present my previous research endeavors in AI.

From a young age, my passion for scientific research has remained unwavering. This can be attributed to my father who works in the field of engineering. Our home lab, equipped with essential tools such as a GPU, oscilloscope, multimeter, and a 3D printer, albeit on a budget, provided the ideal environment for my early exposure to programming in Pascal, circuit design, and the creation of various gadgets. Saturated in the scientific atmosphere, I used to "inventing" a list of gadgets that could enhance daily life, including an automatic watering device and shortcut key management software. This journey not only expanded my knowledge across diverse areas but also instilled in me the ability to learn, adapt, and craft solutions for new challenges—an inherent strength that continues to shape my approach to scientific endeavors.

Owing to my enthusiasm and aptitude, I garnered recognition from both teachers and classmates during my undergraduate studies. So I had the honor and fortune of leading a team to design a vision-based garbage sorting system. We ultimately secured the first prize in the Challenge Cup, achieving a ranking of 54th in mainland China, a milestone for our college. Though, it's hard to describe how much sacrifices that we contributed to the project, including our dedicated scholarship and sacrificing winter and summer vacations. The knowledge and strength gained from this experience make it a truly worthwhile endeavor.

During my graduate studies, I authored four papers with a total impact factor of 36, notably as the lead author in a Top-Q1 Journal paper with an impact factor of 12.1. My key contributions included building a hardware platform, acquiring multi-sensor data, developing preprocessing methods for data imbalance, and independently designing CNN-GRU and BRTCN deep learning architectures. I also validated model efficiency, wrote and revised papers, and responded to peer reviews. Additionally, I co-authored an improved YOLOX paper, contributing to code debugging, paper review, and feedback analysis. Collaborating with my undergraduate teammate, Dr. Jianxiang Cheng at Southern University of Science and Technology, we published in Nature Communications, where I developed an experimental platform and an image processing-based measurement system for two-material transition analysis.

Throughout this journey, I am deeply grateful to Professors **Lingxi Peng** and **Changhong Liu** of Guangzhou University, Professor **Ray Y. Zhong** of the University of Hong Kong, and Professor **Jie M. Zhang** of the King's College London, for their steadfast guidance. These research experiences have honed my ability to swiftly and efficiently solve complex problems, reinforcing my passion for AI. Armed with a solid foundation and a fervent thirst for knowledge, I am confident in my potential to excel in Ph.D. studies in this field.

Above are my motivation for Ph.D. career and my research experience. Given me the opportunity to work with you, I would view this is the beginning of my academic journey.