Mr. Jiale Zhang (张嘉乐)

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EDUCATION

M.S. in Advanced Computer Science (Artificial Intelligence) **09/2019 – 11/2020**
University of Leeds *Leeds, UK*
GPA: 3.55/4.0
Dissertation: Commercial Recognition on Social Media Based on Data Mining **(Distinction)**
Coursework: Artificial Intelligence, Data Science, Bio-Inspired Computing

Visiting Student **08/2020 – 11/2020**
Chinese Academy of Sciences | Shenzhen Institute of Advanced Technology *Shenzhen, China*

B.S. in Information and Computing Sciences **09/2015 – 06/2019**
Shenzhen University *Shenzhen, China*
Dissertation: Design and Implementation of Real-Time Face Recognition System
Coursework: Data Structure, Operation Systems, Numerical Analysis
Excellent Student of Academic Performance 2nd Prize (2015-2016)

PUBLICATIONS

1. [PDF available] **Zhang, J.**, Huang, W., Liao, X., & Wang, Q. (2023, October). Progressive Frequency-Aware Network for Laparoscopic Image Desmoking. In *Chinese Conference on Pattern Recognition and Computer Vision (PRCV)* (pp. 479-492). Singapore: Springer Nature Singapore.
2. [PDF available] Mo, J., Wang, B., Zhang, Z., Chen, Z., Huang, Z., **Zhang, J.**, & Ni, X. (2018, May). A convolution-based approach for fixed-pattern noise removal in OCR. In *2018 International Conference on Artificial Intelligence and Big Data (ICAIBD)* (pp. 134-138). IEEE.

PATENTS

1. [Pending] Bo Ye, **Jiale Zhang**, Chuanjian Wu, Tao Shi, Fangang Kong, Zhuxiang Yang. (2023). A Blood Analysis Device and Method for Species, WIPO Patent Application PCT/CN2023/094636, filed on May 3, 2023
2. [Issued][PDF available] **Jiale Zhang**, Xiangyun Liao, Qiong Wang and Pheng-Ann Heng. (2022). Method and apparatus for Soft Tissue Motion Prediction, Patent No. ZL202110345245.8[P]., China.

ACADEMIC AND PROFESSIONAL EXPERIENCES

Applied Scientist **05/2024 – Present**
Dami and Xiaomi *Shenzhen, China*
AI for autism intervention: *Developing an integrated AI system for childhood autism that generate evaluation reports, personalized intervention strategies and post-intervention plans based on patient data analysis.*

Project 1：LLM-based Clinical Decision Support System for Autism Spectrum Disorder

- Architected a sophisticated multi-agent LLM system featuring specialized agents for assessment (Evaluation Agents) and intervention planning (Planning Agents) orchestrated through a LangChain-based coordination framework to generate comprehensive autism intervention solutions.
- Fine-tuned the base LLM model using a curated dataset of 20,000+ clinical cases and expert annotations, employing supervised fine-tuning (SFT) with parameter-efficient adaptation (LoRA), which improved domain-specific performance by 40% compared to the base model.

- Collaborated with experienced autism therapists to evaluate and implement the AI system across 40+ clinical sites, demonstrating its practical efficacy with an 85% accuracy and a 55% reduction in patient assessment and intervention planning time.

Project 2：AI-Powered Interactive Story Generation Platform for Children with Autism

- Developed a Stable Diffusion-based model fine-tuned with LoRA, ensuring consistent style and therapeutic value in narratives.
- Implemented a dynamic prompt engineering system with context-aware templates and few-shot examples, integrating Chain-of-Thought reasoning to enhance coherence and educational impact.
- Built a full-stack platform for real-time story generation and feedback, now used exclusively by therapists with over 1,000 interactions, providing engaging, adaptive stories for autistic children.

Applied Scientist **07/2021 – 11/2023**

Mindray Bio-Medical Electronics Co., Ltd *Shenzhen, China*

AI for hematology analyzer: *Leveraging machine learning to enhance hematology analyzers, enabling cost-effective and rapid early diagnosis of sepsis through advanced blood cell counting and classification techniques.*

Project 1: Advancements in AI-Based Hematological Analysis

- Developed a Class Activation Mapping (CAM)-based feature selection method for blood biomarkers, which streamlined algorithm design and optimization by reducing feature space 80%.

Project 2: Innovative Sepsis Diagnosis Research

- Led research project on novel hematological parameters for early sepsis diagnosis.
- Implemented a targeted genetic algorithm, enabling precise identification of top N blood cell biomarkers.
- Developed a rule-based algorithm for optimal usage of biomarker panels in varied clinical scenarios, surpassing traditional single biomarker limitations.
- Outperformed current diagnostic methods (CRP\PCT) with superior accuracy (Acc 21%↑& AUC 14%↑), faster results, and cost-efficiency.

Research Assistant **08/2020 – 07/2021**

Chinese Academy of Sciences | Shenzhen Institute of Advanced Technology *Shenzhen, China*

AI in Surgical Enhancement: *Enhancing laparoscopic surgery by mitigating visibility issues due to smoke, and enabling precise tissue targeting in dynamic environments for ultrasound-guided HIFU therapy through advanced predictive modeling.*

Project 1: Efficient Model for Medical Image Enhancement

- Led the development of the PFAN model, a lightweight GAN framework integrating CNN and Transformer based on frequency domain for desmoking laparoscopic images.
- Outperformed existing benchmarks in PSNR, SSIM, CIEDE2000, and visual effects.
- Research accepted by **PRCV 2023**.

Project 2: Spatiotemporal Model for Soft Tissue Motion Prediction

- Developed STU-Net, an Encoder-Decoder framework utilizing spatial and temporal information in HIFU image sequences for improved motion prediction and segmentation.
- Achieved high performance metrics (98.65% BA, 94.32% Dice, 89.26% mIoU) with STU-Net and a prediction speed of 0.23 seconds, enabling real-time treatment adjustments.
- Culminated in a clinically applicable method, recognized with **CN Patent ZL202110345245.8**.

Data Analyst **02/2020 – 09/2020**

Dubit Ltd. *Leeds, UK*

Data Mining in Social Media: *Utilizing machine learning and feature engineering to extract valuable information from social media data, enabling more effective ad targeting by identifying user preferences and*

trending topics.

Project: Innovative Advertisement Video Recognition Method

- Extracted audiovisual features like spectogram and duration using FFmpeg instead of visual features for advertisement video identification, achieving 92% accuracy and 98% AUC through LightGBM model.
- Scripts still run in production today.

Research Assistant **10/2016 – 11/2017**

Shenzhen University *Shenzhen, China*

Machine Translation: *Addressing the complexity of translating concise and allusion-rich ancient Chinese into understandable modern language through advanced neural network technology.*

Project: Neural Network for Machine Translation

- Proposed a convolution-based fixed-pattern noise removal method to optimize text recognition of OCR. Method accepted by **ICAIBD 2018.**
- Build the largest parallel corpus of ancient Chinese and modern Chinese (78,000+ pairs) at that time.
- Proposed a Character-based DBRNN Model for Ancient-Modern Chinese Neural Machine Translation which outperforms state-of-the-art models in terms of BLEU.
- Rated as **National Excellent Innovation and Entrepreneurship Project**.

SKILLS

- **Programming Languages:** Python, C++, C, MATLAB, Java and SQL
- **Frameworks and Tools:** PyTorch, TensorFlow, Large Language Models and Prompt Engineering
- **Research interests:** AI Agents, Large Language Model, Human-Computer Interaction
- **Languages:** Chinese (Native), English (Fluent)