Mr. Jiale Zhang (张嘉乐)

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EDUCATION

M.S. in Advanced Computer Science (Artificial Intelligence) **2019/09 – 2020/11**
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

B.S. in Information and Computing Sciences **2015/09 – 2019/06**
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. [Accepted][PDF available] **Zhang, J.**, Huang, W., Liao, X., & Wang, Q. (2023, August). Progressive Frequency-Aware Network for Laparoscopic Image Desmoking. *In The 6th Chinese Conference on Pattern Recognition and Computer Vision, PRCV2023.*
2. [Published][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. A Blood Analysis Device and Method for Species: PCT/CN2023/094636 [P/OL]. 2023-05-03
2. [Issued][PDF available] **Jiale Zhang**, Xiangyun Liao, Qiong Wang and Pheng-Ann Heng. Method and apparatus for Soft Tissue Motion Prediction: ZL202110345245.8 [P].2022-05-24.

RESEARCH EXPERIENCE

Algorithm and Application Research Engineer **2021/07 – 2023/11**
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 **2020/08 – 2021/07**

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 **2020/02 – 2020/09**

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 **2016/10 – 2017/11**

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 in Healthcare, Generative AI, Machine Learning
- **Languages:** Chinese (Native), English (Fluent)