ZIJUN CHEN

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EDUCATION BACKGROUND

Jinan University - University of Birmingham Joint Institute, Dual Degree (09/2021 - 06/2025)

University of Birmingham - GPA:3.97/4.25, First Class Honours
BSc. in Applied Mathematics and Mathematics

Jinan University - GPA: 89/100
BSc. in Mathematics and Applied Mathematics

Nanyang Technological University, Singapore (08/2025 - present)
MSc. in Biomedical Data Science (AI)

Relevant Coursework: C Programming (88/100), Integer Programming & Combinatorial Optimization (92/100), Mathematical Modeling (87/100), MATLAB Programming (96/100), Multivariable & Vector Analysis (92/100), Statistics (91/100), Applied Statistics (93/100), Differential Geometry (96/100), Deep Learning in Biomedical Science, Techniques in biomedical data mining.

ACADEMIC RESEARCH

Advanced Membrane-Level Cell Segmentation for Enhanced Immunofluorescence Analysis
Computational Digital Pathology Lab, BII, A*STAR, Singapore | Research Assistant (08/2025 - present)
Biomedical Data Science Immersion Scheme | Co-Supervisor: Prof. Weimiao Yu, Prof. Chengxiang Yuan

- Conducted a thorough review of existing cell segmentation methods in multiplexed immunofluorescence imaging.
- Identified a key limitation of current pipelines—nuclear-based methods overlook complex morphologies, while tissue-specific models lack generalizability—highlighting the need for membrane-level segmentation.
- Aimed to propose a generalized strategy leveraging fluorescence-bound membrane markers to delineate concave and deformable cells (e.g., amoeboid immune cells, neurons).

Gesture Recognition from Sensors Using Dual-path Encoding and Attention (09/2024 -04/2025)
Final Year Project | Supervisor: Prof. Zhenyu He

- Identified limitations of existing MEMS-based gesture recognition—traditional fusion strategies fail to adaptively capture cross-modal dependencies, and supervised-only models lack robustness to user variability and sensor noise.
- Proposed a multimodal framework (DS-CAN) with dual convolutional encoders to separately capture accelerometer and gyroscope signals. Introduced a multi-head attention mechanism for adaptive cross-modal fusion, improving robustness over traditional methods.
- Extended contrastive learning to multimodal settings by constructing cross- and intra-modal positive/negative pairs with NT-Xent loss, strengthening feature clustering and separation under noise.
- Achieved state-of-the-art performance (~94% accuracy, 1–3% F1 improvement) on MEMS gesture datasets (6DMG, MGD), and further extended the framework to general posture/activity datasets (UCI-HAR, PAMAP2, MobiAct), demonstrating strong adaptability while maintaining a lightweight architecture (3.9M params, 10.3 ms inference) suitable for real-time wearable deployment.

Creating Supportive Environments to Bridge the Digital Health Literacy for Older People (01/2024 - Present)
Research Advisor: Prof. CHU, Samuel K.W.

- Contributed to a mixed-methods study on digital health literacy among elderly populations across multiple Chinese cities, analyzing 600+ survey responses to identify socioeconomic and technological adoption factors.
- Supported the design and delivery of an 8-week intergenerational co-learning program with community day care centers, facilitating elderly engagement with digital health tools.
- Assisted in evaluating program outcomes through questionnaires and interviews, highlighting improvements in digital confidence and e-health adoption.
- Research findings were presented at the International Conference on GenAI Literacy (ICGAL 2025).

Data-Driven Intelligent Systems Laboratory | Research Assistant (09/2024 - 07/2025)
Supervisor: Prof. Junwei Duan

- Identified limitations of conventional PINN frameworks—dense networks and prolonged training times, and designed novel and broader physics-informed neural network architectures integrating fuzzy rules for solving linear and nonlinear partial differential equations (PDEs), significantly accelerated training with fewer nodes while maintaining high accuracy.
- Conducted a systematic review of AI-driven methodologies for the diagnosis of Alzheimer's disease, evaluating a total of 156 articles retrieved from Web of science.
- Contributed to academic writing on Broad Learning Systems (BLS), drafting the initial chapters on Fuzzy BLS (FBLS) and Extreme FBLS (E-FBLS) for a forthcoming book, showcasing strengths in literature review, organization, and synthesis.

Infectious Disease Simulation Modelling and the Dynamics of transmission (08/2024 - 02/2025)
Research Advisor: Dr. Panayiota Touloupou

- Aimed to improve the prediction in the susceptible-infected-removed (SIR) model by realizing algorithms using R.
- Optimized the prior distribution selection approach for parameters, and forecast recovery rate, initial acquisition rate,community acquisition rate and within-household acquisition rate
- Developed simulation algorithms in R to enhance predictive accuracy in compartmental epidemic models (SIS, SIR, SEIR) by integrating Bayesian inference and MCMC methods.
- Applied advanced sampling techniques, including Gibbs sampling and adaptive Metropolis-Hastings algorithms, to improve parameter estimation and quantify uncertainties in transmission dynamics.

Machine learning prediction with Fano Variety in Tropical Geometry(07/2024 - 08/2024)
Summer Research, Birmingham, UK. | Supervisor: Prof. Michel van Garrel

- Trained predictive models on over 14,000 samples and 28 million quantum period data points of Fano varieties.
- Used PCA for dimensionality reduction and machine learning techniques (MLP, RNN, SVM) to infer geometric properties such as dimensions and torus weights, achieving results consistent with mathematical expectations.
- Identified key factors behind hypothesis deviation, offering invaluable ideas for future mathematical model improvements.

INTERNSHIP EXPERIENCES

Fujian Level One Big Data Development Co., Ltd. | Data Analyst (01/2024 - 02/2024)

- Processed and analyzed large-scale datasets using Python and R, ensuring accuracy and completeness.
- Conducted exploratory data analysis and supported reporting, strengthening data-driven decision-making.

Department of Business Development at CCPIT, Fujian | Market Researcher (07/2023- 08/2023)

- Performed statistical analysis in SPSS to identify export patterns and market trends.
- Built predictive models to evaluate trade policy impacts and delivered actionable insights through visualized reports.

The Center of Experimental Research in Clinical Medicine,
Fujian Provincial Hospital | Laboratory Assistant (07/2022- 08/2022)

- Assisted in data collection, organization, and analysis for clinical research projects.
- Contributed to data processing and reporting, ensuring precision and reliability of experimental outcomes.

HONORS & AWARDS

- University Level Third-Class Scholarship: Recognized for academic excellence, 2023-2024, 2024-2025.
- Excellent Scientific Research Scholarship: Recognized for outstanding performance in summer school, 2024.
- 2022 National College Student Mathematical Modeling Competition: Guangdong Province Second Prize, 2022.
- Mathematical Contest in Modeling (MCM/ICM) : Honorable Mention, 05/2024.

TECHNICAL & LANGUAGES SKILLS

- Programming Languages: MATLAB, C, Python, Java, R, SPSS.
- Software: Microsoft Office Suite (Word, Excel, PowerPoint), LaTeX (Typesetting System).
- Languages: Chinese, English (IELTS7.5)

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