Zidong Chen

52 West Street, Straits Manor Flat 308, Sheffield, S1 4FD
zchen223@sheffield.ac.uk — Mobile: +44 7958 065535

Education

BSc Mathematics–University of Sheffield 2022–2025
Expected First Class Honor 85/100*, WES 4.0/4.0, Rank* 1^{st}

Relevant Coursework: Python and R Programming, Machine Learning, Bayesian Statistics, Analysis, Number Theory, and Abstract Algebra.

MRes AI and Machine Learning – Imperial College London Fall 2025

Publication

[1]Jing Kou, **Zidong Chen**, Liang Zhang, Haiyan Qin, Wang Kang and Wei W. Xing, "Accuracy Is Not Always We Need: Precision-aware Bayesian Yield Optimization," **accepted** to IEEE Design Automation Conference 2025(DAC)
[2]Jing Kou, **Zidong Chen**, Saiya Wang, Yanfang Liu, Wang Kang and Wei W. Xing, "Scalable Bayesian Yield Analysis And Optimization," **submitted** to IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)
[3]Wei W. Xing, Hong Chen, **Zidong Chen**, Zhishan Quan, Bertrand Laratte, Rebecca Holbach, Mark Walsh, Jing Pu, Jose L. Casamayor, "Adaptive LCI Data Completion: Integrating Neural Processes and Active Learning for Enhanced Life Cycle Assessment," **accepted** to 32nd CIRP Conference on Life Cycle Engineering (LCE)

Selected Research Experience

Multi-fidelity Bayesian Yield Optimization October–November 2024
Research Assistant *University of Sheffield*

- Developed various multi-fidelity models (Autoregression, Non-linear AR, Continuous AR) and a novel Bayesian Optimization acquisition function for continuous fidelity, while exploring the relationship between yield precision and fidelity construction.
- **Reduced simulation costs by over 10×** while achieving better final designs and robustness than state-of-the-art high-fidelity approaches.

Automatic Gaussian Processes For AI4Science June–July 2024
UGRI Summer Research (£1,500 grant) *University of Sheffield*

- Developed automatic kernel selection methods, Deep kernel learning and Neural Kernel, to enhance model performance.
- Reproduced and developed new sparse Gaussian Process models for efficient large-scale data handling, implementing algorithms such as Conjugate Gradient and Lanczos to optimize training times on advanced hardware.

Multi-Agent for Automatic Kernel Engineering July–Sept. 2024
Research Assistant *Eastern Institute of Technology*

- Explored methods to mitigate the curse of dimensionality in Gaussian Processes and Bayesian Optimization.
- Engineered a kernel space by integrating domain knowledge from large language models and prior data insights, while exploring the application of Multi-Agent Systems and Reinforcement Learning for iterative performance improvement.

Selected Personal Experience

Machine Learning Engineer Feb. – June 2024
Part-time internship *IceLab-X*

- Investigated the causes of non-positive-definite covariance matrix errors during training—a long-standing technical challenge in the community—and developed methods to resolve the issue.
- **Authored over 2,000 lines of Python code** using PyTorch for Gaussian Processes and Bayesian Optimization models, including their core components. Developed Jupyter Notebook demonstrations and mathematical tutorials for researchers and industry partners.

Artificial Intelligence Summer School July – Aug. 2023
First Class Honor (85/100) *University of Warwick*

- Python programming, Course work including: Built an agent with customised and dynamic strategy for an auction game.
- Introduction to Machine Learning, Reinforcement learning and Game theory

A Level Tutor 2021 – 2022
Full-time job *Shinyway Education*

- Successfully instructed A-Level Mathematics and Further Mathematics in both Mandarin and English.
- Achieved outstanding results, with the majority of tutees earning an A grade in Mathematics.

Skills

Programming Skills:

- Proficient in Python(including Pandas, NumPy and PyTorch), R and LaTeX.
- Developer of the open-source MiniGP repository at IceLab-X on GitHub.

Problem Solving:

- Developed strong problem-solving skills, mental toughness, and the ability to break down complex questions into simpler sub-questions during participation in the problem solving seminar and several mathematic competitions
- Achieved high first result in several abstract pure mathematics course

Communication:

- Experienced in teamwork, including team mathematics contests and collaborative research.
- Member of Sheffield SIAM-IMA Student Chapter, actively advertising for seminars held in the University of Sheffield.

Honours & Awards

1. ***Overall Best Submission & Most Valuable Solution Awards*, SoMaS Team Challenge 2022-2023**
2. ***International Undergraduate Scholarship* 2023 & 2024 (£ 5,000 grant)**
3. ***Honourable Mention for Statistics*, SIAM-IMA Student Chapter Competition**

Interests

1. **Research Interests:** AI&Robotics, Computer Vision, Gaussian Process and Bayesian Optimization
2. **Reading Preferences:** Including Mathematics, Brain Science, Biography and Psychology
3. **Mathematics puzzles:** Actively participated in various pure mathematics contests and mathematical modelling contests. Particularly interested in solving complex puzzles using modern computer science techniques such as Monte Carlo and Reinforcement Learning.
4. **Sports:** Gym exercise, Hiking, Swimming and Table tennis.

References

1. **Prof. Neil P. Dummigan**
   Academic Tutor
   Email: n.p.dummigan@sheffield.ac.uk
2. **Dr. Wei Xing**
   Research Supervisor & Lecturer
   Email: w.xing@sheffield.ac.uk
3. **Dr. Dimitrios Roxanas**
   Lecturer
   Email: D.Roxanas@sheffield.ac.uk