# Zichun Zhu

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	Email: zhuzichunhogan@gmail.com   zichun.zh LinkedIn: linkedin.com/in/zhuzichun/ Google Scholar: scholar.google.com/citations?	hu@uq.edu.au user=Y1qlEjsAAAAJ	
Professional summary	PhD candidate at The University of Queensland specializing in spatiotemporal data analysis, sequential modeling, and AI/ML applications in intelligent transportation systems. Known for being a fast learner with strong problem-solving skills and the ability to quickly adapt to new tools, frameworks, and research domains. Passionate about transforming complex data into actionable insights through innovative modeling techniques.		
Education	The University of Queensland	Brisbane, QLD	
	Doctor of Philosophy	April 2021 – Aug 2025 (Expected)	
	School of Electrical Engineering and Computer Science		
	The University of Melbourne	Melbourne, VIC	
	Master of Science (Computer Science)	July 2018 – June 2020	
	The University of Melbourne	Melbourne, VIC	
	Diploma in Informatics	July 2017 – June 2018	
	The University of Melbourne	Melbourne, VIC	
	Bachelor of Science	July 2015 – June 2018	
	Electrical Systems		
Skills	Programming		
	Python, R, C++, Java, JavaScript, Matlab, SQL, HTML, CSS, Pascal, Haskell, Prolog, Verilog		
	Software & Technical Skills		
	Unity3D, Arduino, ROS (Robot Operating System), QGIS, MATLAB, MySQL, PostgreSQL, MongoDB, Visual Studio, Eclipse, VS Code, Linux-based HPC environments, AWS (basic), PowerBI (basic), Latex		
	AI & Machine Learning Skills		
	Supervised (LR, SVM, RF, XGBoost), Clustering Algorith inforcement Learning (MDP, Q-Learning), Natural Lang Sequence Models, Transformers, LLMs), Contrastive Lea	nms, Deep Learning (MLP, RNN, CNN, GNN), Re- uage Processing (Word2Vec, TF-IDF, Sequence-to- rning, Self-supervised Learning	
	Data & Analytics		
	Data Cleaning, Data Wrangling, Data Analytics, Data Vi	sualisation, Dashboard, Statistical Modelling	
Research	Bluetooth-Based Trajectory Reconstruction for Url	oan Mobility Analysis	
experience	The University of Queensland	April 2021 – Present	
	ARC Linkage Project — Collaboration with Transport and	Main Roads (TMR) & Brisbane City Council (BCC)	
	$\star$ Conducted three research studies on reconstructing	individual trajectories from sparse, time-stamped	
	Bluetooth records; Contributed to the ARC Linkage ini	tiative to enhance real-time mobility intelligence	
	and collaborated closely with TMR and BCC to align res	earch with practical urban transport needs.	
	$\star$ Led data preprocessing, modeling, and evaluation to in	fer user-level trajectories; Developed a deep learn-	
	ing model with reinforcement learning to map trajectories to road network segments; Proposed contrastive		
	learning framework to address data quality issues and improve trajectory consistency.		
	Infectious Disease Modelling – Malaria Transmissi	on Dynamics	

University of Melbourne

May 2019 - July 2020

	★ Developed a population-level simulation model incorporating within-host parasite dynamics to investi- gate malaria transmission; Explored how within-host interactions influence broader epidemic patterns and transmission outcomes.		
	★ Integrated stochastic simulation techniques and parameter calibration to ensure biological realism and model robustness; Contributed to understanding the lifecycle of malaria parasites and their implications for disease control strategies.		
Publications	- <b>Map-matching on wireless traffic sensor data with a sequence-to-sequence model</b> . Zichun Zhu, Dan He, Wen Hua, Jiwon Kim & Hua Shi. 24th IEEE International Conference on Mobile Data Management (MDM), 2023.		
	<ul> <li>- CLMM: Uncertainty-aware Map-Matching for Bluetooth Data through Contrastive Learning.</li> <li>Zichun Zhu, Fengmei Jin, Wen Hua &amp; Jiwon Kim. 35th Australasian Database Conference (ADC), 2024.</li> <li>- A Framework for Few-Shot Map-Matching through Semi-Supervised Self-Training. Zichun Zhu,</li> <li>Fengmei Jin, Wen Hua &amp; Jiwon Kim. IEEE Transactions on Intelligent Transportation Systems. Under Review.</li> </ul>		
Professional	Conference Presenter		
development	Singapore3 July 2023 - 6 July 2023		
	★ IEEE International Conference on Mobile Data Management (MDM)		
	Gold Coast & Tokyo 16 December 2024 - 18 December 2024		
	* Australasian Database Conference (ADC)		
	Teaching Assistant		
	University of Melbourne March 2019 - July 2019		
	★ Foundations of Computing		
Project	RoboMaster - Simulation Team		
experience	Societiy, University of Melbourne Sep, 2019 - May 2020		
	$\star$ RoboMaster project includes teams specified on hardware and embedded, computer vision, AI and robot control, and simulation.		
	$\star$ Collaborated in a team focused on the ICRA RoboMaster AI Challenge, gaining hands-on experience in simulation design, robotics automation, and agile project development.		
	★ Developed a real-time simulation environment in Unity3D for training autonomous robots, writing robust		
	C# scripts to support various robotic maneuvers.		
	Autonomous Pacman		
	Developer 2019		
	$\star$ Developed an autonomous Pacman agent using Python within the Berkeley Pacman framework and suc-		
	cessfully competed in a tournament.		
	* Engineered a robust decision-making module that integrates advanced AI techniques, including Monte		
	Carlo Tree Search, Approximate Q-Learning, and Value Iteration, to dynamically navigate game challenges.		
	$\star$ Demonstrated expertise in algorithm design and strategic planning by creating an adaptive agent capable of making real-time decisions in a complex, adversarial environment.		
	Twitter analysis		
	Developer 2019		

 $\star$  Developed a real-time system for collecting and analyzing Twitter data to uncover patterns related to obesity rates in Australia.

★ Engineered the solution to run on a high-performance computing platform, leveraging technologies such as Ansible for deployment automation, CouchDB for efficient data storage, MapReduce for processing largescale tweet data, and NLP techniques for text analysis.

 $\star$  Demonstrated the ability to integrate and scale multiple technologies in a complex data pipeline, offering insights into social media trends and public health correlations.

#### **FPGA Computer and Calculator**

#### Developer

★ Designed and implemented a fully functional embedded system on an FPGA board by developing a custom CPU, ROM, and peripheral interfaces using Verilog.

 $\star$  Engineered a stack-based Reverse Polish Notation (RPN) calculator capable of performing signed 8-bit addition and multiplication (range: –128 to 127) with integrated overflow detection and status LED indicators.

★ Demonstrated comprehensive understanding of digital system design, microprocessor architecture, finite state machines, and hardware/software co-design through testing and iterative development.

★ Leveraged strong problem-solving skills by executing the full design—from hardware interfacing to lowlevel program execution—ensuring practical application of computer engineering principles on FPGA platforms.

### Other experience Waiter (Part-time)

Parrot House Restaurant, Melbourne

May, 2016 - Dec 2017

 $\star$  Provided high-quality customer service in a fast-paced dining environment, serving a diverse clientele; Managed multiple tables efficiently while maintaining attention to detail and professionalism.

★ Demonstrated excellent communication and teamwork skills through coordination with kitchen and front-of-house staff; Adapted quickly to changing demands and peak service periods, strengthening time management and problem-solving abilities.

#### Cellist

EMS Orchestra (Society), University of Melbourne	2015 - 2016
CMG Orchestra (Society), University of Melbourne	2016 - 2017

#### Referees Prof. Wen Hua

Associate Professor The Hong Kong Polytechnic University wency.hua@polyu.edu.hk Department of Data Science and Artificial Intelligence

## Dr. Dan He

Data Scientist Queensland Fire Department doris.he@qfes.qld.gov.au Strategy Directorate

2019