

Jiajun Ou

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EDUCATION

Nanyang Technological University (NTU)

Singapore

Research in CEE, Focus: Traffic safety analysis, Supervisor: Prof.ZHU FENG

Sep 2024-Mar 2025

Guangdong University of Technology

Guangzhou, China

M.Eng., majoring in Control Science and Engineering

Sep 2022-June 2025

- WAM: 88.3/100 (top 2%)
- Major Courses: Machine Vision Recognition and Detection Techniques (92), 5G+ Smart Manufacturing (94), Intelligent Transportation Technology (96), System Identification and Parameter Estimation (96).

Guangdong University of Technology

Guangzhou, China

B.Eng., majoring in Data Science and Big Data Technology

Sep 2018-June 2022

- WAM: 83.19/100
- Major Courses: Data Mining and Applications (93), Comprehensive Big Data Technology Project (98), Business Intelligence and Data Warehousing (98), Principles of Automatic Control (92), Data Structures and Algorithm Design experiments (Excellent).

PUBLICATIONS/WORKING PAPERS/PATENT

Published Research Articles

- **Ou Jiajun**, Wen Junlin, Tan Wenbing, et al. *A data-driven approach for understanding the structure dependence of redox activity in humic substances*. Environmental Research, **JCR Q1 TOP**. [Link:10.1016/j.envres.2022.115142]
- **Ou Jiajun**, Luo Xiaoshan, Liu Junyang, et al. *Predicting microbial extracellular electron transfer activity in paddy soils with soil physicochemical properties using machine learning*. Science China Technological Sciences, 2024, 67(1): 259-270. **JCR Q1** [Link:10.1007/s11431-023-2537-y]
- Kunting Xie, **Ou Jiajun (Co-author)**, et al. *Predicting the Bioaccessibility of Soil Cd, Pb, and As with Advanced Machine Learning for Continental-Scale Soil Environmental Criteria Determination in China*.[J]. Environment & Health, 2024. **China S&T Excellence Journal** [Link:10.1021/envhealth.4c00035]
- Wu Cenguang, Dong Huang, **Ou Jiajun**, et al. *Climate change and population aging may impact the benefits of improved air quality on cardiovascular mortality in Guangzhou: epidemiological evidence and policy implications*. Environmental Science: Advances, 2023, 2(2): 215-226. **JCR Q2** [Link:10.1039/D2VA00303A]
- Lu, S., Zeng, W., Li, X., **Ou Jiajun**. Adaptive lightweight network construction method for self-knowledge distillation. Neurocomputing, 129477. **JCR Q1** [Link:10.1016/j.neucom.2025.129477]

Patent Applications

- **Ou Jiajun**, Zeng Weiliang, Huang Yonghui, Sun Weijun. *Method for Solving Medical Waste Collection Problems Using an Improved Genetic Algorithm*. CN113762780B (**Granted**).
- **Ou Jiajun**, Chen Siyu, Zeng Weiliang, Lin Qinyong. *Method for Extracting UAV Aerial Video Trajectory Data of Traffic Participants at Complex Intersections*. CN118172385A. (**Granted**)
- Li Liye, **Ou Jiajun**, Zeng Weiliang. *A blockchain life bill payment method based on a multi-level trust Byzantine consensus mechanism*. CN118154177B (**Granted**).
- Zeng Weiliang, Lin Qinyong, **Ou Jiajun**, Zhu Boyang. *Method for U-turn Intent and Trajectory Prediction Based on High-Dimensional Embedding and Deep Parallel Computing*. CN116312050A. (**Granted**).
- **Ou Jiajun**, Zeng Weiliang, Chen Siyu, Luo Yulong. *Deep Learning Modeling Method for Interaction Behavior Between Left-Turning Vehicles and Violating Bicycles at Intersections*. CN2023110619318.

SELECTED HONORS & AWARDS

1. The Asia Pacific ICT Alliance Awards (APICTA) Merit & Certificate of Nomination 2023.12
2. **National Scholarship** for Master's Degree Students, Twice 2023.10 & 2024.10
3. Master's Degree First-Class Scholarship, Twice (**Rank 1 in the School of Automation**) 2023.10 & 2024.10
4. The 3rd International Competition for Intelligent Simulation of Transport Infrastructure, Second Prize 2024.12
5. 17th "Challenge Cup" Guangdong College Students' Extracurricular Academic Science and Technology Competition, Grand Prize 2023.12
6. 9th China International "Internet+" College Students Innovation and Entrepreneurship Competition, Guangdong Provincial Bronze Award 2023.9
7. 2023 Network Technology Challenge, South China, Third Prize 2023.7
8. First Yi Xian Cup South China Colleges "Intelligent+" Innovation Competition, Second Prize 2023.7
9. Outstanding Undergraduate Thesis Award 2022.6

RESEARCH EXPERIENCE

Extracting Mixed Traffic Flow Trajectories with Enhanced AT-YOLOv8 Jan 2023 – Present

Position: Research Assistant, Advisor: Prof. Weiliang Zeng (GDUT); Prof. ZHU FENG (NTU)

- Engineered a framework merging MHA-YOLOv8 with Coordinate Attention for enhanced detection and Improved DeepSORT for accurate tracking, streamlining mixed traffic flow trajectory analysis from UAV&CCTV data.
- Implemented refined video stabilization and advanced tracking algorithms, achieving an unparalleled 98.5% accuracy in trajectory extraction across a wide spectrum of traffic entities from UAV footage.
- Submitted a paper to a **JCR Q1** journal for review. Launched the **TrafficSense** project in Hong Kong, securing **\$100,000** from HKSTP. Launched the **Smartflow** project in NTU and awards **SDG\$5,000**, with ongoing development.

Optimizing LLMs for Edge AIPC Deployment Nov 2023 – Present

Position: Project Lead/Technical Lead, Advisor: Prof. Rong Yu (Top 2% Scientists Worldwide)

- Utilizing QLoRA for efficient quantization and PEFT for fine-tuning reduces memory needs without compromising performance, enabling robust AI tools in educational settings.
- Leveraging Intel OpenVINO and Nvidia CUDA to optimize LLMs significantly improves deployment efficiency and flexibility across varied environments. Boosting adaptability and performance in multiple user contexts.
- Forging intentions to collaborate with eight major tertiary institutions in the Greater Bay Area, and applying for the Hong Kong Cyberport Creative Micro Fund.

Applying Machine Learning in Environmental Engineering Sep 2018 – Dec 2022

Position: Research Assistant, Advisor: Prof. Yuan Yong (Top 2% Scientists Worldwide)

- Engineered an Autoencoder Ensemble Stacking (AES) model, markedly advancing predictions of microbial EET activities in paddy soils through adept utilization of soil physicochemical properties, setting a new benchmark in predictive environmental analytics.
- Proved the superiority of Artificial Neural Networks (ANN) in identifying key physicochemical properties influencing the redox activities of humic substances.
- Contributed to the interdisciplinary field of machine learning and environmental engineering, accomplishing two SCI publications in Q1 journals.

WORKING EXPERIENCE

Guangzhou Zhi Fang Information Technology Co., Ltd. Nov 2021 – Feb 2022

Development Internship, Supervised by Dr. Peilin Nie *Guangzhou, China*

- Optimized iBeacon Bluetooth beacon calibration and indoor positioning accuracy by analyzing environmental characteristics and applying signal processing techniques.
- Boosted system reliability and accuracy with Kalman filters for signal processing and ANN models for precise RSSI-based distance measurements, enabling smart indoor path planning.
- Contributed to WeChat Mini Program development with JavaScript, improving the indoor positioning product's performance and user experience. [\[Link\]](#)

TECHNICAL SKILLS

Languages: Chinese, Cantonese, English

Programming Languages: Python, Javascript, C

Frameworks: PyTorch, OpenVINO, CUDA

Developer Tools: PyCharm, Matlab, Xcode