Kaichen Ouyang

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Education Background

2020.09 – 2024.06 University of Science and Technology of China China

- Degree: Bachelor
- Major: Mathematics and Applied Mathematics GPA: 82.04/100 IELTS:7.0/9.0
- Certificate: Plan for strengthening basic academic disciplines, Strengthening Foundation Plan in Mathematics
- Google Scholar ：
- https://scholar.google.com/citations?hl=en&user=mbXU6jIAAAAJ&view_op=list_works&gmla=AIfU4H6jC
- WMU5dI7FPaVrUqQqMjpy_CYIFkCO7jDS1u-G-9RoKH3OqF44fDE4etf92suGzkubJrjxogd0w1zxA1T
- Homepage:https://github.com/oykc1234/Blog
- Research Interests:Evolutionary Computation | Statistical Physics | Machine Learning

Publications and Preprints

- Ouyang, K., et al. ***Study of nonequilibrium phase transitions mechanisms in exclusive network and node model of heterogeneous assignment based on real experimental data of KIF3AC and KIF3CC motors.*** European Physical Journal Plus. (JCR Q2, IF:2.8)-**Co Author**
- Ouyang, K., et al. ***Physical mechanisms of exit dynamics in microchannels of nonequilibrium transport systems***. International Journal of Modern Physics B. (JCR Q2, IF:2.6)-**Co Author**
- Ouyang, K.,et al. ***Escape: an optimization method based on crowd evacuation behaviors.*** Artificial Intelligence Review. (JCR Q1, IF:13.9)--**First Author**
- Ouyang, K.,et al. ***Multiple Objectives Escaping Bird Search Optimization and Its application in Stock Market Prediction Based on Transformer Model***. Scientific Reports. (JCR Q1, IF:3.9)--**Corresponding Author**
- Ouyang, K.,et al. ***A Comprehensive Analysis of Digital Inclusive Finance's Influence on High Quality Enterprise Development through Fixed Effects and Deep Learning Frameworks***. Scientific Reports. (JCR Q1, IF:3.9)--**Corresponding Author**
- Ouyang, K., et al. ***Dynamic Graph Neural Evolution:An Evolutionary Framework Integrating Graph Neura Networks with Adaptive Filtering.*** 2025 IEEE Congress on Evolutionary Computation (Oral)--**First Author**
- Ouyang, K., et al ***Trend-Aware Mechanism for metaheuristic algorithms*** Applied Soft Computing (JCR Q1, IF:6.6)**--Second Author**
- Ouyang, K., et al ***A Generative Adversarial Network Based Investor Sentiment Indicator: Superior Predictability for the Stock Market*** Mathematics (JCR Q1, IF:2.2)--**Corresponding Author**
- Ouyang, K., et al ***Graph Learning Metallic Glass Discovery from Wikipedia*** Summit in Nature machine intelligence (JCR Q1, IF:23.9)--**First Author**
- Ouyang, K., et al ***Learn from Global Correlations: Enhancing Evolutionary Algorithm via Spectral GNN*** Summit in 2025 Neural Information processing Systems (Arxiv)--**First Author**
- Ouyang, K., et al ***Stochastic Gradient-guided Adaptive Differential Evolution: Algorithm and Its Application in the Diagnosis of COVID-19, Influenza, and Bacterial Pneumonia*** Artificial Intelligence In Medicine (JCR Q1, IF:6.1), *Under review*--**First Author**
- Ouyang, K., et al ***Rethinking Over-Smoothing in Graph Neural Networks: A Perspective from Anderson Localization*** (Arxiv)--**Sole First Author**
- Ouyang, K., et al ***Consciousness as a Jamming Phase*** (Arxiv)--**Sole First Author**
- Ouyang, K., et al ***Why Flow Matching is Particle Swarm Optimization?*** (Arxiv)--**Sole First Author**
- Ouyang, K., et al ***Multi-Objective Mobile Damped Wave Algorithm (MOMDWA): A Novel Approach For Quantum System Control*** (Arxiv)--**Corresponding Author**
- Ouyang, K., et al ***Newton Downhill Optimizer for Global Optimization with Application to Breast Cancer***

Feature Selection Biomedical Signal Processing and Control (JCR Q1, IF:4.9), *Under review*--***Corresponding Author***

- Ouyang, K., et al ***Multi-objective Red-billed Blue Magpie Optimizer: A Novel Algorithm for Multi-objective UAV Path Planning*** Results in Engineering (JCR Q1, IF:7.9), *Under review*--**First Author**
- Ouyang, K., et al ***Beaver Behavior Optimizer: A Novel Metaheuristic Algorithm for Solar PV Parameter Identification and Engineering Problems*** Journal of Advanced Research (JCR Q1, IF:13.0), *Under review*--**First Author**
- Ouyang, K., et al ***An Improved Optical Microscope Algorithm for Training Multi-layer Perceptron and Engineering Optimization*** The Journal of Supercomputing (JCR Q2, IF:2.9), *Under review*--**First Author**
- Ouyang, K.,et al ***Multi-strategy improved dung beetle algorithm and its applications in engineering optimization and bankruptcy prediction*** Neural Networks (JCR Q1,IF:6.3), *Under review*--***Corresponding Author***
- Ouyang, K.,et al ***Twisted Convolutional Networks (TCNs): Enhancing Feature Interactions for Non-Spatial Data Classification*** Neural Networks (JCR Q1,IF:6.3), *Under review*-**Co Author**

Research Experience

- 2025.5 - Present, Data-Driven Multi-Objective Evolutionary Design of Battery Liquid Cooling Materials, USTC, RA
- 2024.2 - Present, Graph Neural Networks & Material Science, Songshan Lake Materials Laboratory, RA
- 2023.5 - 2024.6, Intersection of Non-equilibrium Statistical Physics & Machine Learning, USTC, RA
- 2021.9 - Present, Evolutionary Algorithms & Machine Learning, Wenzhou University, RA
- 2021.3 - 2022.9, Non-equilibrium Statistical Physics & Complex Networks, USTC, RA

Conference Experience

- *CAMMIC 2023:* Discrete Optimization and Optimization of Ethanol Preparation Problem
- *IEEE ICSP 2023:* Quantitative Supervised Learning System of Light Pollution and Its Application
- *IEEE CVIDL 2023*: Intelligent Thermostatic Cold Storage Design Strategies based on Monte Carlo and Graph Neural Networks
- *MAEIE 2024:* Multi-Objective Fertilization Optimization: A New Approach for Microgrid Scheduling
- *5th Amorphous Physics and Materials Symposium 2024*, Attendee

School Experience

- 2022, Mathematical Analysis B1, Teaching Assistant
- 2024, Mathematical Modeling, Teaching Assistant
- 2024, Swarm and Evolutionary Computation (JCR Q1, IF: 8.2), Reviewer
- 2025,Knowledge-Based Systems,(JCR Q1, IF: 7.2), Reviewer
- 2025,International Joint Conference on Neural Networks (IJCNN),Reviewer
- 2025,International Conference on Intelligent Computing (ICIC),Reviewer

Honours

- 2024, Second Prize(Honorable Mention), MCM/ICM
- 2023, First Prize (Meritorious), Huashu Cup International Mathematical Contest in Modeling
- 2023, First Prize,National College Students' Mathematics Competition
- 2022, International Second Prize, Asia-Pacific Mathematical Mode,ling Competition
- 2020-2021, Outstanding Student Gold Award, University of Science and Technology of China

Skills

- **Language skills**: Chinese (Native), English (Fluent)
- **Computer Skills**: Microsoft Office 365, Python, MATLAB, MySQL, Java,C/C++,Lammps