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
- Homepage: https://oykc1234.github.io/
- Research Interests: Artificial Intelligence | Quantitative Finance | Complex Systems

Publications

- 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 ***Beaver Behavior Optimizer: A Novel Metaheuristic Algorithm for Solar PV Parameter Identification and Engineering Problems*** Journal of Advanced Research (JCR Q1, IF:13.0)**--First 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), **--First 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. ***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 ***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 ***Trend-Aware Mechanism for metaheuristic algorithms*** Applied Soft Computing (JCR Q1, IF:6.6)**--Second Author**
- Ouyang, K., et al ***MLLMs-MR: Multi-modal Recognition based on Multi-modal Large Language Models*** Knowledge-Based Systems.(JCR Q1, IF: 7.2)-**Second Author**
- 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 ***Wave Optics Optimizer: A novel meta-heuristic algorithm for engineering optimization*** Communications In Nonlinear Science And Numerical Simulation(JCR Q1,IF:3.8)**-Co Author**

Preprints and Works under review

- Ouyang, K., et al ***Graph Learning Metallic Glass Discovery from Wikipedia*** Nature machine intelligence (JCR Q1, IF:23.9)--*Under review*--**First Author**
- Ouyang, K., et al ***Learn from Global Correlations: Enhancing Evolutionary Algorithm via Spectral GNN*** 2026 AAAI,*Under review*--**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-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**
- Ouyang, K ***IKUN: A mean-field game theoretic KD-tree density guided mechanism for swarm optimization*** Swarm and Evolutionary Computation (JCR Q1,IF:8.5), *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
- 2023.9 - 2024.4, Deep Neural Network-Based Control of Quantum Uncertain Systems, USTC,University Innovation Project
- 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

- 5th Amorphous Physics and Materials Symposium 2024, Attendee
- IEEE Congress on Evolutionary Computation (CEC) 2025, Oral Presentation

Teaching Assistant Experience

- 2022, Mathematical Analysis B1, Teaching Assistant
- 2024, Mathematical Modeling, Teaching Assistant

Reviewer Experience

- 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
- 2025,AAAI 2026,Reviewer
- 2025,Computers and Electrical Engineering (JCR Q1, IF: 4.9), Reviewer
- 2025,International Journal of Computational Intelligence Systems (JCR Q2, IF: 3.116), Reviewer
- 2025,Information Sciences (JCR Q1, IF: 6.8), 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 Modeling 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