





Haoxiang Lu

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Education





- 2024 – 2027  **University of Chinese Academy of Sciences**
Beijing, China M.S. in Environmental Engineering, GPA – 3.8/4.0 *Advisor: Prof. Zhi Qian* 
Core Courses: **Data Analysis** in Environmental Engineering Practice, **Mathematical Models** of Environmental Engineering and MATLAB Application, Pattern Recognition and **Machine Learning**, **Optimization** for Data Science, Introduction to **LLMs**
- 2020 – 2024  **East China University of Science and Technology**
Shanghai, China B.S. in Environmental Engineering, GPA – 3.3/4.0 *Advisor: Prof. Juying Lei* 
Outstanding Engineer Education and Training Program
Thesis: *Preparation of Ti_3C_2 MXene-based Composites for Photocatalytic CO_2 Reduction*

Research Publications

Journal Articles

- 1 **Haoxiang Lu**[†], Xihu Sun[†], Guozhong Li, and Zhi Qian*, “An Interpretable Predictive Model for High-Gravity NO_x Oxidation-Absorption Driven by Physics-Informed Neural Networks,” *Industrial & Engineering Chemistry Research* (In Peer Review), 2025.
- 2 Xihu Sun[†], **Haoxiang Lu**[†], and Zhi Qian*, “A Bayesian-State-ANFIS Model for H_2S Removal using a High-Gravity Reactor,” *Chemical Engineering Science* (In Peer Review), 2025.

Research Experience


-  **Interpretable Physics-Informed Neural Networks for HiGee Systems [1]** Mar. 2025 - Sep. 2025
University of Chinese Academy of Sciences *Advisor: Prof. Zhi Qian* 
 - ▷ Pioneered a multi-branch PINN with a hard parameter-sharing architecture, creating a physically-consistent alternative to “black-box” models for simulating high-gravity NO_x removal
 - ▷ Achieved high-fidelity prediction ($R^2 = 0.931$) by embedding physical laws (mass transfer, reaction kinetics) into the model, enhancing convergence and generalization, especially with sparse or noisy datasets
 - ▷ Leveraged SHAP to deliver model interpretability, identifying rotational speed as the key driver for process intensification and establishing a theoretical guide for industrial process optimization
-  **Intelligent Modeling and Control with Bayesian State-ANFIS [2]** Aug. 2024 - Aug. 2025
Weiqiao National Higher Technology Research Institute *Advisor: Prof. Zhi Qian* 
 - ▷ Developed a novel Bayesian-State ANFIS to automatically decouple complex multivariable interactions in industrial high-gravity H_2S removal processes
 - ▷ Designed the system to automatically decouple input variables into “state” and “explanatory” subspaces, creating a transparent model with 243 interpretable IF-THEN fuzzy rules that achieved superior industrial performance ($R^2 = 0.974$)
 - ▷ Applied the high-fidelity model to design a PSO-based optimization strategy and a fuzzy PID controller, establishing a framework for minimizing operational costs and improving robust dynamic control

Work Experience

Teaching

- **University of Chinese Academy of Sciences** Sep. 2025 - Present
 - ▷ Teaching Assistant in *Mathematical Models of Environmental Engineering and MATLAB Application*
- **East China University of Science and Technology** Mar. 2021 - Jul. 2021
 - ▷ Teaching Assistant in *Advanced Mathematics (II)*

Industry

- **Shandong Weiqiao Pioneering Co., Ltd. (Fortune Global 500)** Aug. 2024 - Oct. 2025
Process Engineer
 - ▷ Oversaw the end-to-end implementation of a high-gravity desulfurization system, from process design and CAD-based pipeline layout to on-site construction supervision for a 3000m³/h unit
 - ▷ Engineered and optimized the process parameters post-commissioning, achieving and sustaining an H₂S absorption efficiency of over 96%
 - ▷ Developed and executed operational and monitoring protocols that ensured the system's stable, continuous operation for over a year, establishing a new benchmark for process reliability
- **Tongji Architecture Design Co., Ltd.** Jul. 2023 - Sep. 2023
Research Intern *Advisor: Dr. Yuting Zhu* 
 - ▷ Identified key research trends and emerging technologies in activated carbon regeneration by conducting a comprehensive bibliometric analysis using VOSviewer and CiteSpace
 - ▷ Synthesized findings into a detailed report that provided strategic insights and informed the research direction for the senior team

Skills

Coding	■ Python, R, MATLAB, Mathematica, L ^A T _E X, SQL
AI & ML	■ PyTorch, LLMs, Scikit-Learn, XGBoost, CatBoost, Scikit-Fuzzy, Optuna
Software	■ SPSS, Jade, Adobe Illustrator, Fluent, Aspen Plus, VOSviewer, OpenLCA
Instruments	■ XRD, SEM, TEM, FTIR, Raman, XPS, UV-vis, EIS, EBS, TPC, EDS
Professional Skills	■ Teaching, Research Design, Technical Writing, Data Analysis, Presentation

Honors and Recognition

Awards and Honors

- 2024 ■ **Gold Medal** (Team Member), 49th International Exhibition of Inventions Geneva, for "*High Gravity Selective Desulfurization Technology*"

Scholarships

- 2024 – 2026 ■ **Graduate Academic Scholarship**, University of Chinese Academy of Sciences
- 2023 ■ **Outstanding Undergraduate Scholarship**, University of Chinese Academy of Sciences
- 2020 – 2023 ■ **Merit-based Scholarship** (Third Class), East China University of Science and Technology