Xukun Zhu

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Education

Imperial College London Oct. 2022 - Oct. 2023
MSC ECOLOGY, EVOLUTION AND CONSERVATION
Core modules: Biological Computing in R, Spatial Analyses and GIS, Genomics and Bioinformatics, Advanced Statistics
Dissertation: Machine learning approaches to the evolution and ecology of fossils, supervised by Dr Will Pearse from Imperial College London, Prof Richard Twitchett and Dr Stephen Stukins from Natural History Museum London.

Nanjing University of Information Science & Technology/ University of Reading Sept. 2018 - June 2022
BSC ENVIRONMENTAL ENGINEERING
GPA: 3.8/5.0 (First Class Honours)
Core modules: Environmental Chemistry, Advanced Mathematics, Analysing Data
Dissertation: Prussian blue analogue-derived Fe-Co alloy@N-doped carbon for highly effective oxygen catalysis, supervised by Prof Mingdao Zhang, Nanjing University of Information Science & Technology.

Relevant Experience

Machine Learning Pipeline for Fossil Image Processing Mar. 2023 - Sep. 2023
POSTGRADUATE DISSERTATION
• Worked interdisciplinarily with palaeontologists, with the aim of building a semi-supervised pipeline in Python to perform fossil image analysis.
• Performed a series of image processing techniques on fossil glass slide images, including image segmentation (using open-source Segment Anything Model), feature extraction, image clustering, image compression and image classification.
• Conducted elliptical Fourier Analysis and principle coordinate analysis on fossil shapes using Momocs in R.
• Worked on a remote server via SSH using Bash commands.

AI/ML Intern Oct. 2022 - Present
CHINA TELECOM (EUROPE) LTD.
• Assisted in the Proof of Concept (PoC) processes of on-premises Large Language Model (LLM) including environment configuration, model testing and model documentation.
• Collaborate with multi-functional teams including hiring managers, algorithm scientists and customers to identify and implement the most effective Robotic Process Automation (RPA) design.

R Programming Feb. 2023
POSTGRADUATE MINI PROJECT
• Investigated environmental and anthropogenic factors affecting the winter wheat production in Tibetan area through linear regression model.
• Link: https://github.com/zxkcody/EECMaster-mini-project

R Programming Dec. 2022
POSTGRADUATE COURSE ASSIGNMENT
• Investigated effects of climate change on the suitable habitat of *Lynx pardinus*.
• Applied linear regression and species distribution models to predict the distribution under future climate change scenarios.

Additional Experience

Volunteer Jul. 2023
BUGS, BIRDS AND BEASTS DAY, SILWOOD PARK, ASCOT, UK
• Organised and set up the event site with college students and staff.
• Responsible for giving the butterfly tours on campus.

Undergraduate Lab Research Mar 2019 - June 2022
NANJING, JIANGSU, PR CHINA
• Worked independently on the design, assembly and testing of lithium battery (cell and soft packing battery).
• Gained hands-on experience in lab equipment and protocols such as ultrasonic cleaner, tube furnace, vacuum drying oven, electrochemical workstation, rotating ring disk electrode, electrochemical data recording and analysis.
• Worked effectively with fellow researchers, staff members, faculty, supervisors, and students.

Field Work Jan. 2021
NANJING, JIANGSU, PR CHINA

• Measured environmental variables including precipitation amount, noise level, water, soil, and atmosphere quality.
• Cultivated soil bacteria using pour plate and streak plate techniques.

Course Assistant Sept. 2019 - June 2021
NANJING, JIANGSU, PR CHINA
• Assisted teachers in creating educational materials, including production and editing of instructional videos.
• Supported teachers with marking assignments.
• Liaised with students, teachers, instructional administrators as required.

Session Talks

AI in Palaeontology Workshop Oct. 2023
NATURAL HISTORY MUSEUM, LONDON, UK
• Invited as a guest speaker to present the work of 'Machine Learning Pipeline for Fossil Image Processing'.
• Collaboratively participated in the preparation of the conference paper.

Lundy Field Research Nov. 2022
LUNDY ISLAND, UK
• Worked collaboratively with teammates to estimate the population size of the Lundy house sparrows using Mark Recapture analysis.
• Collated population data from different sources.
• Presented the group work to a broad range of audiences including non-science audiences and ornithologists.

Publications

2023

Liu, Y., Zhang, H., Yang, C., Xu, Z., Shi, Y., **Zhu, X.**, Duan, X., Qin, L., Jin, Y., Song, L., Zhang, M., Zheng, H. (2023). Alkaline hydrogen production promoted by small-molecule modification on flowerlike $Co_2(OH)_2CO_3$. Journal of Energy Chemistry.

Song, L., Qi, C., Wang, S., **Zhu, X.**, Zhang, T., Jin, Y., Zhang, M. (2023). Direct regeneration of waste $LiFePO_4$ cathode materials with a solid-phase method promoted by activated CNTs. Waste Management, 157, 141–148.

2022

Wang, S., Zhang, T., **Zhu, X.**, Zu, S., Xie, Z., Lu, X., Zhang, M., Song, L., Jin, Y. (2022). Metal–Organic Frameworks for Electrocatalytic Sensing of Hydrogen Peroxide. Molecules, 27(14), 4571.

Jin, Y., Zhang, T., Pan, N., Wang, S., Zhang, B., **Zhu, X.**, Hao, Y., Wang, X., Song, L., Zhang, M. (2022). Surface functionalization of carbon cloth with conductive Ni / Fe-MOFs for highly efficient oxygen evolution. Surfaces and Interfaces, 33(January), 102294.

Qi, C., Wang, S., **Zhu, X.**, Zhang, T., Gou, Y., Xie, Z., Jin, Y., Wang, Y., Song, L., Zhang, M. (2022). Environmental-friendly low-cost direct regeneration of cathode material from spent $LiFePO_4$. Journal of Alloys and Compounds, 924, 166612.

Qi, C., Zu, S., **Zhu, X.**, Zhang, T., Li, L., Song, L., Jin, Y., Zhang, M. (2022). Applied Surface Science Bamboo-shaped Co @ NCNTs as superior sulfur host for Li-S batteries. Applied Surface Science, 601(July), 154245.

2021

Duan, X., Pan, N., Sun, C., Zhang, K., **Zhu, X.**, Zhang, M., Song, L., Zheng, H. (2021). MOF-derived Co-MOF,O-doped carbon as trifunctional electrocatalysts to enable highly efficient Zn–air batteries and water-splitting. Journal of Energy Chemistry, 56, 290–298.

Duan, X., Ren, S., Ge, F., **Zhu, X.**, Zhang, M., Zheng, H. (2021). MOF-derived CoNi,CoO,NiO@N–C bifunctional oxygen electrocatalysts for liquid and all-solid-state Zn–air batteries. Nanoscale.

Language

English Fluent
Mandarin Native

Referees

Dr Will Pearse Postgraduate supervisor
IMPERIAL COLLEGE LONDON, SILWOOD PARK, ASCOT, LONDON
Email: will.pearse@imperial.ac.uk
Website: http://pearselab.com/

Richard Twitchett Postgraduate supervisor
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Prof Mingdao Zhang Undergraduate supervisor
NANJING UNIVERSITY OF INFORMATION SCIENCE & TECHNOLOGY, NANJING
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