

CURRICULUM VITAE

HANHUI HUANG, Ph. D. Candidate

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EDUCATION

University of Oxford, 2023 – 2027 (Expected)

Department of Earth Sciences

Ph. D. in Earth Sciences

Nanjing University, 2019 - 2023

School of Earth Sciences and Engineering

B. Sc. in Biological Evolution and Environment

GPA: 4.53/5.0; Ranking: 2/35

RESEARCH INTERESTS

Artificial intelligence in geology and paleontology

Quantitative stratigraphy

Biodiversity and its drivers in deep time

PUBLICATIONS

Chu, T., **Huang, H.**, Fan, J., Shi, Y., Qian, C., et al. (in preparation). HORSE: harmonize regional and global stratigraphic records by horizon sequencing.

Huang, H., Shi, Y., Chen, Q., Xu, H., Song, S., et al. (2024). An image dataset of fusulinid foraminifera generated with the aid of deep learning. *Geoscience Data Journal*, 11, 46–56. Available from: <https://doi.org/10.1002/gdj3.215>

Hou, C.*, Lin, X.*, **Huang, H.***, Xu, S., Fan, J., et al. (2023). Fossil image identification using deep learning ensembles of data augmented multiviews. *Methods in Ecology and Evolution*, 14, 3020–3034. Available from: <https://doi.org/10.1111/2041-210X.14229>
(*: Equal contribution)

Huang, H., Hou, C., Lin, X., Shi, Y., Lv, H., Fan, J. (2023). Large image dataset of fusulinids and automatic identification using multi-view ensemble learning. In Abstracts of *the 8th Biennial Academic Conference of the Paleontological Society of China, Paleoenvironmental Professional Committee*. (in Chinese) (Distinguished student oral report)

SCHOLARSHIP/AWARDS

2024 Burdett-Coutts Fund (£ 2,200), Department of Earth Sciences, University of Oxford

2024 Barbinder Watson Fund (£ 500), St Hugh's College, University of Oxford

2023 Scholarship for Studying Abroad, China Scholarship Council

2022 China National Scholarship (¥ 10,000), Ministry of Education of China
2021 CHOW TAI FOOK Scholarship (First Prize, ¥ 8,000), Nanjing University
2020 The People's Scholarship (First Prize, ¥ 2,000), Ministry of Education of China

RESEARCH EXPERIENCES

The Heterogeneity of the Great Ordovician Biodiversification Event in Space and Time, Oct 2023 – Present

Advisor: Prof. Erin Saupe | University of Oxford; Prof. Junxuan Fan | Nanjing University

- Developed an algorithm for stratigraphic correlation of local geological records (HORSE) to correlate fossil records from different localities
- Exploring methods for spatial-temporal bias control on fossil occurrence data
- Exploring quantitative co-analyses of palaeobiological and environmental data

Explainable Machine Learning in Image Identification, Oct 2023 – Present

Advisor: Prof. Junxuan Fan & Prof. Yukun Shi | Nanjing University; Prof. Erin Saupe | University of Oxford

- Developing explainable deep learning frameworks to understand how machines “think” when inferencing

Image-based Fusulinid Identification and Classification, Oct 2021 – Jul 2023

Advisor: Prof. Yukun Shi & Prof. Junxuan Fan | Nanjing University

- Produced the first large image dataset of fusulinids (2400 images) with the aid of deep learning image segmentation technique (BlendMask)
- Developed a combined method of deep learning and multi-view augmentation for efficient fusulinid image identification reaching >90% accuracy on generic level
- Conducted advanced morphometric analysis for fusulinid taxonomy and phylogeny

Cambrian Marine Biodiversity in North China, Oct 2021 - Present

Advisor: Prof. Yukun Shi & Prof. Junxuan Fan | Nanjing University

- Co-work with another undergraduate, Yujie Shi
- Designed the data collection, data cleansing, and data analysis procedure, with implementation of the stratigraphic correlation method CONOP (CONstrained OPTimization)
- Developed a Python package for biodiversity analysis based on CONOP output, including functions like bias correction, diversity count, and plotting
- Assisting in data processing and result interpretation

Face Recognition for Chinese Ungulates, Dec 2021 – Dec 2022

Advisor: Prof. Zhongqiu Li & Prof. Jie Guo | Nanjing University

- Designed the data collection and processing procedure with team members
- Labeled image data collected from field trips for deep learning model training
- Assisted in developing an application prototype for ungulates face recognition

FIELD TRIPS

Jiangsu Province and its surrounding regions, field work, 2020-2021

Yunnan Province, field work, 2022

Chaohu, field mapping, 2022

JOBS/OUTREACH

Demonstrator, Jan 2024

Invertebrate Palaeontology, University of Oxford

- Demonstrated at the practical section of the course

Team Leader of Advocacy Group, Jun 2022 – Jun 2023

Li Siguang Lecture Team, Nanjing University

- Led a team of five for advocacy of a scientific outreach project for children in Nanjing Library
- Sought and contacted sponsors for the project
- Designed posts, posters and videos

Peer Mentor, Jun 2021 – Sept 2022

Nanjing University

- Oriented freshmen in their first-year life and helped out when they faced problems in all aspects
- Received agreement from students and the university as a qualified peer mentor

SKILLS

Programming languages:

- Proficiency: Python (for machine learning and data analysis), R (for data analysis)
- Basics: C/C++

Software:

- Proficiency: Microsoft Office, Photoshop, CorelDRAW, PAST
- Basics: Origin, MEGA, MATLAB, Mathematica, etc.

LANGUAGE

- IELTS Academic (Oct 2022): 8.0 (Overall), 8.5 (Listening), 8.5 (Reading), 7.0 (Writing), 7.0 (Speaking)