

Buyu Deng

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🐙 BuyuDeng



Education

2023.09 – Expected **B.S. Candidate**, *School of the Gifted Young*, University of Science and Technology of China (USTC)
2027.06 **Major:** Geophysics

GPA: 3.62/4.30 (**Rank:** 3/20)

Relevant Coursework: Linear Algebra: **90**, Probability & Statistics: **92**, Theoretical Mechanics: **95**, Python & Deep Learning: **A**, Programming in Geophysics: **94**, Introduction to Seismic Exploration: **98**

Research Interests: Seismic interpretation, geomodeling, forward modeling; deep learning, agentic AI

Research Experience

2026.07 – Present **Undergraduate Research Intern**, [Stanford Center for Earth Resources Forecasting \(SCERF\)](#), Stanford University
Supervisor: **Prof. Tapan Mukerji**

- Conduct research on geomodeling and forward modeling for subsurface energy systems.

2024.08 – Present **Undergraduate Researcher**, [Computational Interpretation Group \(CIG\)](#)
Supervisor: **Prof. Xinming Wu**

3D "All-in-One" Seismic Denoising

- Built a synthetic 3D seismic dataset with random noise, acquisition footprints, and migration artifacts; trained an all-in-one denoising network based on Degradation Representation Learning.

Code: github.com/BuyuDeng/NDR_Seismic

Geo-VAE for 3D Geophysical Data Compression & Latent Processing

- Adapted Wan-VAE with cached causal pseudo-temporal resampling along crossline, achieving isotropic $8 \times 8 \times 8$ downsampling and 31.0:1 scalar compression for 256^3 cubes.
- Benchmarked five 3D geophysical modalities over 128^3 – 512^3 cubes; maintained competitive, modality-dependent reconstruction fidelity and reduced latency versus fine-tuned Wan-VAE at larger cube sizes.

- Developed RGT-conditioned seismic generation and 768^3 complete-volume latent denoising; one latent-map call achieved higher SSIM and lower leakage than raw-space controls.

Full manuscript under revision at *Geophysics*; gave an oral presentation at IMAGE 2026.

Code: github.com/BuyuDeng/Geo-VAE

PHY-to-BGC Ocean Biogeochemical Emulation

- Built a 2.5D full-image U-Net emulator mapping global physical ocean fields to coupled biogeochemical variables, with evaluation under anomalous ocean-climate conditions; **manuscript in preparation**.

GNSS-NISAR Ionospheric Super-Resolution Reconstruction

- Developed an automated pipeline aligning GNSS TEC-derived ionospheric phase with NISAR dual-frequency InSAR for high-resolution super-resolution research.

Honors and Awards

- 2025 **Zhao Jiuzhang Elite Program Scholarship**, School of Earth and Space Sciences
2024 **Rose Fund Endeavor Scholarship**, School of the Gifted Young
2024 **Zhao Jiuzhang Elite Program Scholarship**, School of Earth and Space Sciences
2023 **Freshman Scholarship**, University of Science and Technology of China (USTC)

Experience and Leadership

2025.08 **IPGP Geophysical Field Camp:** conducted geophysical surveys and joined academic seminars with faculty from the Institut de Physique du Globe de Paris (IPGP).

2025.06 – 2026.01 **Head (Minister)**, Dept. of Cultural & Sports in College Student Union