Zhihao **LIU**

GEODATA · GEOPHYSICS · RESEARCH ASSISTANT

Oslo, Norway & Tianjin, China

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About Me

I am geophysical data scientist since 2014, with a passion for developing innovative tools/workflows that transform sensor data into actionable decisions to safely accelerate the energy transition…My expertise lies in enhancing the safety and efficiency of offshore energy projects through advanced data analysis and machine learning techniques.

Experience

Business development

Full-time @ Tianjin

BGP OFFSHORE, CHINA NATIONAL PETROLEUM CORPORATION

2024.07 - Present

- Specialized in implementing seismic acquisition techniques across various environments (Streamer, OBN, TZ) with a strong focus on driving innovation.
- Promoting front-edge techniques such as Carbon Capture and Storage (CCS), hybrid acquisition, and sparse node in offshore energy industry.
- Supported the full-cycle of seismic projects, including bidding, audit, project planning & monitoring, HSEQ and finalization & evaluation.

Data Scientist

Freelancing @ Oslo

EUROSTAR / IKOS

2024.02 - 2024.03

- Consulted on the development of a train tracking platform. Applied the Unscented Kalman Filter (UKF) algorithm and engineered a robust microservice architecture using FastAPI and PostgreSQL.

Research Assistant

Part-time @ Oslo

UNIVERSITY OF OSLO

2021.11 - 2023.12

- Teaching Assistant for Geophysical Data Science, providing hands-on training in scientific programming and data analysis to students.
- How does climate change impact wind and solar production? Host a summer scholar project funded by UiO: Energy and Environment. Focusing on exploring machine learning algorithm for bias correction and spatial downscaling.
- Contributed to the SNOWDEPTH, a research project founded by Norwegian Research Council, applying remote sensing and machine learning for spatial-temporal modeling of seasonal snow, a key factor in climate and hydropower.

Field Engineer & Assistant Project Manager

Full-time @ offshore

BGP OFFSHORE, CHINA NATIONAL PETROLEUM CORPORATION

2014.07 - 2021.07

- Participated in over 12 offshore surveys worldwide onboard. The focus is to deliver high-quality geophysical datasets and de-risking offshore operations, aligning with IOGP and client's protocols.
- Developed data processing pipeline and quality control software for geophysical surveys.
- Earned my license as a Registered Surveyor in 2018.
- Promoted to a senior position as Assistant Project Manager in January 2021.

Education

University of Oslo

Oslo, NO

M.SC IN GEOSCIENCE

2021.08 - 2023.07

- My study focuses on change detection and intergrating these signals to geophysical models (inversion problems) using Bayesian inference and machine learning.
- Presented my thesis at the International Union of Geodesy and Geophysics (IUGG) 2023 in Berlin, supported by a travel grant and scholarship from Industrial Liaison program.
- Key Courses (GPA 3.9/4.0): Geophysical Data Science; Advanced Remote Sensing and Topographic Analysis;Surveying, Photogrammetry and Spatial Analysis; Glacial and Periglacial Geomorphology; Avalanche, Flood and Landslides.

Southwest Petroleum University Chengdu, PRC

B.Sc in Geodesy and Geomatics 2010.09 - 2014.07

Four-years engineering education. With a solid background in GIS and Geophysics, underpinned by a strong proficiency in mathematics and statistics. Thesis: A WebGIS System for Urban Infrastructure Management (Grade: A)

Survey Projects

Offshore seismic exploration in the Norwegian Sea Offshore Bergen, NO

Survey Engineer 2020.07 - 2020.10

Participated in the Quad 35 survey (2020.07-2020.10), and get commendation from client for inovation mindset.

- The Quad 35 is well-known in industry for its innovative combination of streamer and OBN (Ocean Bottom Node) technologies, delivering high-quality seismic data.
- The wide-towed sources enriches the near-offset sampling and better supports AVO analysis. The OBN nodes are deployed sparsely to support FWI for a better velocity model.

Offshore side-scan sonar survey Offshore Morocco

Survey Engineer 2017.04 - 2017.04

- Side-scan sonar is especially useful for detecting and mapping underwater hazards like shipwrecks, pipelines, and other obstacles that could pose risks to navigation or construction activities.
- Led a side-scan sonar survey to map and identify potential seabed hazards, ensuring safe seismic operation.
- Managed the entire survey process independently, from mobilization to acquisition, including the installation and calibration of the towfish and GPS systems.
- Collaborated closely with the onboard crew to coordinate survey operations, ensuring efficient workflow.
- Produced high-resolution imagery of the seafloor topography.

Publications, Conferences and Patents

Snow Distribution Patterns from Satellite Laser Altimetry Peer-reviewed Paper

Zhihao Liu, Désirée Treichler, Simon Filhol · 2024

Snow Depth Retrieval and Downscaling Using Satellite Laser Altimetry, Machine Learning and Climate Reanalysis Oral Presentation

Zhihao Liu, Désirée Treichler, Marco Mazzolini · IUGG 2023, Berlin

An identification system for underwater seismic devices Patent

PRC 201911154941X · Issued May 13, 2022

Analysis and processing of USBL positioning data in marine seismic exploration Paper

Equipment for Geophysical Prospecting · 2022

Wide-towed sources in streamer seismic: a case study from Norway Q35 Conference Paper

Zhihao Liu, Bo Wen, Yuanjie Liu, Xuebin Qin, Qian Zhao · Society of Petroleum Geophysicists 2021, Chengdu

Offshoreorinet v1.0 seismic QC software Software Copyright

2020SR0194691 · Issued Mar 2, 2020

Skills, Tools and Topics

Languages Chinese, English, Norsk (beginner)

Tools Python, Machine Learning, Statistics, GIS, Git, LaTex

Topics Climate change, Offshore energy, Carbon capture and storage (CCS), Energy transition