BAO NGUYEN

DATA SCIENTIST

CONTACT

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SUMMARY

Data Scientist with acute expertise in reservoir geophysics for oil and gas Exploration and Development. Able to develop and deliver fit-for-purpose geoscientific solutions. Very comfortable with quick adoption of new software and with writing computer programs in Python.

EDUCATION

The University of Texas at Dallas
PhD Geosciences (Geophysics) 2014

Southern Methodist University
BS Computer Engineering 2005

SKILLS

DATA SCIENCE: Machine Learning, SKLearn, Pandas, Numpy, Tensorflow, Bokeh, Matplotlib
PROGRAMMING: Python, SQL, Matlab, Fortran
GEOPHYSICS: Imaging, Interpretation, Inversion
LEADERSHIP: Empathy, Collaboration, Ownership

PUBLICATIONS

[2016] Polarized wavefield magnitudes with optical flow for elastic angle-domain common-image gathers: GEOPHYSICS, 81(4), S239-S251. https://doi.org/10.1190/geo2015-0518.1

[2015] Improving input/output performance in 2D and 3D angle-domain common-image gathers from reverse time migration: GEOPHYSICS, 80(2), S65-S77. https://doi.org/10.1190/geo2014-0209.1

[2015] Five ways to avoid storing source wavefield snapshots in 2D elastic prestack reverse time migration: GEOPHYSICS, 80(1), S1-S18. https://doi.org/10.1190/geo2014-0014.1

[2013] Excitation amplitude imaging condition for prestack reverse-time migration: GEOPHYSICS, 78(1), S37-S46. https://doi.org/10.1190/geo2012-0079.1

[2013] Joint inversion for ocean bottom node position and average water velocity along the shot line: SEG Technical Program and Expanded Abstracts, 4880-4884. https://doi.org/10.1190/segam2013-1240.1

EXPERIENCE

Metis · Remote - Houston, TX — Sep. 2020 - Dec. 2020

Data Scientist

Completed Metis's 12-week accredited data science program focused on Python programming, machine learning, statistical modeling, data visualization, data engineering, and communication. Designed, implemented, and presented five end-to-end projects. Please see selective work:

Augmenting Seismic Interpretation Using Expedient Seismic Lithology Prediction

- Supervised Decision Tree classifier with a set of 24 uniquely engineered generalized and domain-specific features for prediction , versus a specialized neural net implementation
- Allows fast adoption and QC of intermediary results for real-time work, before considering neural nets
- Over 90% Recall & F1 scores for target classes on 5 million samples; baseline model runs < 1 hour

Natural Language Processing: What Earnings Calls Can Tell Us

- Topic modeling for 5 semiconductor companies' earnings calls over 20 fiscal quarters using Latent Dirichlet Allocation (LDA), Non-negative Matrix Factorization (NMF), and Self-Organizing Maps (SOMs)
- Selected topics include: Bandwidth Technologies, Growth Opportunities, and Strategy with some additional expected topics such as, Primary Business, Stakeholders, and Revenue/Profit
- Using SOMs gave unsorted topics that appear more interpretive than either LDA or NMF

Classification: What in the (H)Well? Predicting Rock Types in Oil and Gas Wells

- Used supervised Logistic Regression, KNN, Random Forests, and XGBoost classifier models to train and ultimately predict the rock types present in a zone-of-interest for unknown (unlabeled) wells.
- Lithology prediction addresses a crucial part of a potential investment into exploring for oil and gas as it looks at how economical the field is likely to be based on its predicted size. We could imagine that mis-predictions for the overall thickness of certain lithologies could have very significant consequences in the risk aversion for an oil and gas investment portfolio.
- Visualization packages used: Bokeh for interactive data exploration,T, XGBoost), PCA, Self-Organizing Maps (SuSi SOM), and Matplotlib

CNOOC International · Houston, TX — Mar. 2014 - Sep. 2020

Geophysicist, International Developments (2014 - 2020)

Lead Geophysicist for Hammerhead Field Development (OBO), Stabroek block in deepwater Guyana.

- Responsible for seismic interpretations and geophysical workup of all Southeastern areas covering discoveries at Uaru, Mako, the Tails, and Turbot
- Created novel rock-physics-guided seismic inversion workflows for the Liza Development area in deepwater Guyana to incorporate rock property volumes into reservoir geomodeling
- Geophysical mapping and interpretation using seismic attributes to delineate potential baffle zones
- Conducted Fluid replacement modeling for Liza Phase I, Liza Phase II, and Payara/Pacora reservoirs to capture range of seismic uncertainty due to fluid properties and downhole conditions
- Interpreted and reinterpreted seismic using QI-derived products on Operator-provided deliverables

Houston, TX

Geophysicist, Exploration (2014 - 2017)

Project Geophysicist on the EGOM Maturation Team focused on seismic reservoir characterization and seismic interpretation of the deep Jurassic Norphlet Play (>1 BBOE recoverable, OBO) overlying autochthonous salt.

- Delivered several prestack seismic inversions of multiclient and proprietary reprocessed datasets
- Participated in the full lifecycle QA/QC of three reprocessing FourPoint projects for the Eastern Gulf of Mexico deepwater Norphlet Play
- Matured several deepwater EGOM prospects from initial-to-final internal review gates – including seismic interpretation/mapping, seismic attribute generation and analysis, rock property inversion for reservoir characterization, inputs for scoping volumes, and prospect risking analysis
- Performed AVO inversion feasibility studies, wedge modeling, fluid replacement modeling, seismic forward modeling, and crossplot analysis
- Served as a Geophysical Mentor for Summer Intern (2017): oversaw depth uncertainty and velocity analyses, using fresh drilling information via Castle Valley well

BP · Hoston, TX — May 2011 - Aug. 2011

Geophysicist Intern

- Developed and tested a nonlinear least-squares solution to the coupled problem of deepwater velocity estimation (cold water statics) and ocean-bottom node (OBN) positioning. Method is applied for 4D (time-lapse) OBN marine data collected over the Atlantis oil field.
- Corrected water velocities produce improved migrations for both Base and Monitor surveys, accounting for observed time shifts in the overburden above the reservoir.