ABHISHEK D. BIHANI, PH.D.

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CAREER SUMMARY

- Data Scientist skilled in applying machine learning and deep learning for research and delivering actionable insights.
- Demonstrated ability to collaborate with partners and communicate recommendations to non-technical stakeholders.
- Certified experience in building cloud-based machine learning pipelines and open-source software development.
- Proficient in using data wrangling and modeling of complex datasets for inference and prediction to achieve business goals.

KEY ATTRIBUTES

- PhD in Engineering
- AWS Machine Learning Certified
- Strong Technical Writing and Visualization Skills
- Quantitative Research Experience
- Quick-learner and Adaptable
- Passionate about Data Science and Analytics

TECHNICAL SKILLS

Programming: Python (Jupyter, NumPy, Pandas, OpenCV), C++ (Palabos), MySQL, MATLAB, Bash, Git

Data Engineering: PySpark, AWS Kinesis, Glue, Athena

Machine Learning: SageMaker, Scikit-learn, XGBoost, LightGBM, PyCaret, Featuretools, Hyperopt

Deep Learning: PyTorch, TensorFlow, Keras

Analytics and Visualization: Tableau, SPSS, QuickSight, Matplotlib, Seaborn

RELEVANT EXPERIENCE

Graduate Researcher | Center for Subsurface Energy & Environment | UT Austin **Aug 2014 – May 2020**

- **PhD:** Used deep learning, statistical image analysis, and simulations to reduce the risk of underground fluids leaking by anomalous flow, and communicated results to stakeholders by publishing research papers, posters, and a dissertation.
  - **MudrockNet | GitHub | Python (TensorFlow, OpenCV), MATLAB**
    Constructed a convolutional neural network for semantic image segmentation to identify grain-scale features from scanning electron microscope (SEM) images and achieved ~0.75 mean intersection over union.
  - **Multiphase LBM Toolbox | GitHub | C++ (Palabos), Python, MATLAB**
    Co-developed and released an open-source simulation toolbox for modeling multiphase flows and characterization of complex 3D geometries using high-performance computing (HPC) resources.
- **MS:** Applied machine learning, petrophysics, and thermodynamics to reconstruct missing data and estimate the extent of gas hydrates in the northern Gulf of Mexico and published results in conferences and a master's thesis.
  - **Synthetic Well-log Reconstruction | GitHub | Python (Scikit-learn, Pandas, Seaborn, Jupyter)**
    Generated a workflow for synthetic reconstruction of a missing well log through feature engineering, time-series analysis techniques, and multivariate polynomial regression to increase variance explained (R^2) from 0.26 (base-case) to 0.54.

Reservoir Engineer | Geology & Reservoir Department | Oil India Limited **Oct 2011 – Jul 2014**

- Led the Improved Oil Recovery team in a collaborative cross-functional brownfield analysis of 500+ wells using statistical modeling and time series analysis of pressure and production rate data which led to 3000+ barrel/day rise in oil production.
- Built non-linear multivariate regression models in SPSS for crude oil viscosity prediction (R^2=0.57) using experimental data from 162 wells to help improve data quality for reservoir modeling.
- Worked with the finance department to calculate incremental recovery and profits using reserve estimation, stochastic modeling, and decline curve predictions, reported to stockholders and the Indian Parliament for the financial years 2012 and 2013.

Undergraduate Intern | Oil and Natural Gas Corporation of India (ONGC) **Jan 2011 – Jun 2011**

- Improved artificial lift by developing a flow optimization algorithm in a team of four and improved the oil production by 90 barrel/day.

Summer Intern | Essar Oil Limited **Jun 2010 – Jul 2010**

- Conducted a sensitivity analysis by the Monte Carlo method on 10 coal-bed methane wells to reduce uncertainty in input data by ~ 5%.

DATA SCIENCE PROJECTS

Home Credit Default Risk Recognition | GitHub | Python (Scikit-learn, XGBoost, LightGBM, Featuretools, Hyperopt, Pandas, Seaborn)
Created a machine learning pipeline for binary classification with automated feature engineering using ETL functions, comparison of multiple classifiers on imbalanced data, and automated hyperparameter tuning to achieve a test ROC AUC score of 0.786.

Movie Sentiment Analysis | GitHub | AWS (SageMaker, Lambda), Python (PyTorch, NLTK, Pandas, Seaborn)
Built an LSTM-based model on AWS SageMaker for determining the sentiment of movie reviews using natural language processing on the IMDB data set, deployed as a simple web app.

PROFESSIONAL DEVELOPMENT

Certifications

AWS Certified Machine Learning Specialty - MLS-C01 Nov 2020

Udacity Nanodegree - Machine Learning Engineer Jul 2020

Udacity Nanodegree - Computer Vision Feb 2020

Volunteering

Graduate Faculty Selection Committee UT Austin, 2017 – 2019

- *Interviewed potential new department faculty, met external department reviewers, and conducted outreach activities*

Presiding Officer – Dibrugarh Constituency, Indian Parliamentary Election Election Commission of India, 2014

- *Supervised team of six allowing 749 people to vote in the Indian Parliamentary election of 2014*

Vice President, Public Relations Toastmasters Club of Pune – West, 2010 – 2011

- *Promoted Toastmasters to public by maintaining club website, editing club magazine, and interviewing with local newspapers*

President Society of Petroleum Engineers Student Chapter, 2010 – 2011

- *Organized national-level conference by raising $ 6000 and received the Gold Standard award for exceptional work*

Awards

Department of Petroleum and Geosystems Engineering Research Award GAIN Conference - Austin, 2019

- *Award for best research poster among 20+ candidates*

Advanced Communicator Bronze, Competent Communicator, Competent Leader Toastmasters International, 2011

- *Awards for completing 20 public speaking assignments and holding 10+ roles in Toastmasters meetings*

Ravindra Kulkarni Silver Medal University of Pune, 2011

- *Award for 2nd highest grade in graduating class of 70+ students*

EDUCATION

The University of Texas at Austin (UT Austin), USA

Ph.D. - Petroleum Engineering May 2020

M.S. - Petroleum Engineering May 2016

Research Focus: Subsurface Machine / Deep Learning, Computational Fluid Dynamics (CFD), Statistical Modeling

Maharashtra Institute of Technology, University of Pune, India

B.E. - Petroleum Engineering May 2011

SELECTED PUBLICATIONS

- **A. Bihani**, H. Daigle (2019). On the Role of Spatially Correlated Heterogeneity in Determining Mudrock Sealing Capacity for CO_2 Sequestration. Marine and Petroleum Geology, 106(106), 116–127. doi.org/10.1016/j.marpetgeo.2019.04.038.
- **A. Bihani**, H. Daigle, J. Santos, C. Landry, M. Prodanović, K. Milliken (2019). Insight into the Sealing Capacity of Mudrocks determined using a Digital Rock Physics Workflow. Texas Advanced Computing Center Symposium for Texas Researchers (TACCSTER), 26-27 September, Austin, TX, USA. doi.org/10.26153/tsw/6874