Bharat Bonala, Ph.D.

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Profile

- 14+ years O&G upstream Seismic Data Processing experience, providing data-driven insights for strategic decisions.
- Springboard Data Science Fellow proficient in Data Science, Machine Learning, Classification, Regression, Time Series Analysis, Deep Learning, NLP, Python, SQL, and PySpark.
- Academic research in Signal and Image Processing, Statistical Data Analysis, and Neural Networks.
- AWS Certified Cloud Solutions Architect (Associate) with basic cloud services knowledge.

Work Experience

Springboard Data Science Fellow — Mar 2023 – Feb 2024

- 600-hour online certificate course in Data Science with 1:1 mentoring and worked on three different capstone projects independently.
- Time-series forecasting problem: Predicted three months of future sales data from a large dataset generated from several stores and items using SARIMA. Analyzed the seasonality trends in the data by decomposing the time-series plots; also analyzed for any degeneracies between different stores and items. Different prediction models were evaluated using SMAPE.
- Customer churn prediction: Developed a classification model which forecasts customer churn behavior with 75% accuracy based on relevant customer data. By understanding the reasons behind customers leaving, focused customer retention programs were recommended to increase retention chances. Various classification algorithms such as random forest, logistic regression, XGBoost, ADA Boost, Gradient Boosting, LightGBM, SVMs were implemented and evaluated.
- Ski resort ticket price prediction: Implemented linear regression and random forests for ski resort ticket price prediction, boosting revenue by $3.5M annually.
- Completed assignments covering diverse topics, including K-means clustering for customer segmentation and NLP-based spam classification achieving 97.5% accuracy.
- Proficient in statistical inference, bootstrapping, hypothesis & A/B testing: Hospital data was used to evaluate if the revenue had fallen below a key threshold and if patients with and without insurance are charged differently.
- Skilled in data mining using HTTP requests, BeautifulSoup, and APIs such as Quandl and Tweepy.

CGG, Houston Tx
Senior Team Leader/Team Leader — **Sep 2009 - Present**

- Imaging leader with 14+ years of experience in applying signal & image processing techniques towards processing terabytes of seismic data, building state of the art models of earth's interior.
- Business value creation:

- Presented data insights to CGG management and industry clients, facilitating MM$ energy exploration decisions. Represented CGG at various industry-academia meetings.

- Team Leadership, Training and Mentoring
  - Led a team of 10+ seismic imagers for multi-client projects with major oil companies.
  - Mentored over 20 junior imaging scientists.
- Technology development:
  - Created a processing pipeline for predictive modeling of acoustic velocity based on batch processing vs offline processing, leading to record-setting project deliveries and new MM$ project awards.
  - Implemented anomaly detection for improved uptime (up to 50%) in datacenters and GPUs.
  - Tested and deployed Convolution Neural Networks (CNN) for image segmentation to enable automated 3D surface mapping of salt domes. This reduced the production time by 80%.
  - Collaborated with researchers and software departments to develop internal tools, improving workflows and reducing personnel requirements by 15-30%.
  - Automated workflows using python, pandas and internal packages, to deliver a hands-off process saving 30% in time and enhancing accuracy.

Education

Ph.D. in Electrical Engineering	*University of Houston, Houston, Texas*	Aug 2009
M.S. in Electrical Engineering	*University of Houston, Houston, Texas*	Aug 2006
B.E. in Electronics and Communication Engineering	*University of Madras, India*	May 2004

Certifications

- AWS Cloud Practitioner | Amazon Web Services | Nov 2021
- AWS Certified Solutions Architect: Associate | Amazon Web Services | Dec 2021

Academic Research

- **Classifier to detect Schizophrenia in humans (M.S. Thesis)**
  - Designed a classifier based on statistical analysis of the specific time-locked EEG events in response to external stimuli to identify a normal subject from a patient suffering with Schizophrenia.
- **Neural Networks based model to simulate short term memory (Ph.D. Dissertation)**
  - Developed a neural network-based mathematical model of a non-linear memory system pivotal to P300 evoked responses. Simulations were validated with experimental results by statistical analysis.

Selected Publications

- **Bonala B et al.:** Improving reservoir imaging using long-offset OBN data: A case study from Conger field, Gulf of Mexico, **Third International Meeting for Applied Geoscience and Energy,** 1812, **2023**
- **Bonala B et al.:** A computational model for generation of the P300 evoked potential component, **Journal of Integrated Neuroscience,** 11(3): 277-94, **2012**
- **Bonala B et al.:** Auditory P300 differences between healthy and schizophrenic subjects revealed by single trial analysis, **Conference Proceedings 2nd International IEEE EMBS,** 577-578, **2006**