ABIN SHAKYA

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EDUCATION

Louisiana State University, Baton Rouge *Advisor: Dr. Bijaya Karki*
PhD in Computer Science : 4.062/4.0 GPA *Aug 2021 - May 2026 (Expected)*
Relevant Courses : Applied Deep Learning, Bayesian Data Analysis,
Machine Learning, Big Data Analysis, Statistics 7004, Statistics 7014, Algorithm Design and Analysis

Tribhuvan University, Kathmandu, Nepal *Advisor: Dr. Subarna Shakya*
BE in Computer Engineering: 3.6 GPA (US Scale) *Nov 2013 - Nov 2017*

EXPERIENCES

Louisiana State University, Baton Rouge
Position: Research Assistant *Aug 2021 - Present*

- Building Graph Neural Network-accelerated Molecular Dynamics to explore atom distribution in Earth's core.
- Developing an active learning framework to sample comprehensive high-dimensional first-principles molecular dynamics data, which is subsequently utilized for model building.
- Developed deep learning-based potential energy models for molecular dynamics, facilitating simulations of Earth's interior, and authored the paper **Insights into core-mantle differentiation from bulk Earth melt simulations**. DOI: 10.1038/s41598-024-69873-8
- Performed binning analysis to identify bimodal distribution and verify core-mantle segregation using strongly connected components. Additionally, created a 3D convex hull to model the Earth's core boundary, employing multiple methods for comprehensive validation.
- Implemented a state-of-the-art Bayesian Neural Network architecture to address prediction uncertainty in X-ray dataset, contributing to more reliable and robust predictions.

Sparrow Private Limited, Lalitpur, Nepal *Oct 2017 - Sep 2021*
Position: Software Engineer

- Worked as a Backend Engineer (Python/Django), leading the architecture and development of a robust Digital Wallet.
- Build a middle-ware layer called Service Layer that integrates APIs from multiple vendors (both SOAP and REST API) and expose a consistent REST API for our clients.
- Optimized the efficiency of a flight search engine by implementing caching and parallelization strategies, resulting in a more than 4x improvement in search response times.
- **Migrated code base from Django 1.8 to Django 2.2, ensuring modern and efficient framework utilization.**
- Streamlined daily operations by automating tasks to support the finance team in reconciliations.

SKILLS

Programming Language:	**Python**, **R**, JAVA, C, C++, SAS, SQL, MATLAB
Frameworks/Libraries:	**Pytorch, Tensorflow**, Django/DRF, PySpark, Keras, Pandas, Numpy, Scikit-Learn, Matplotlib, PyG, HPC, Seaborn
Tools, Technologies, DB:	PostgreSQL, MongoDB, SparkSQL, PySpark, Apache Kafka, Apache Hadoop Amazon S3, Nginx, Redis, RabbitMQ, Latex
ML skills:	**Graph Learning, Representation Learning**, Generative AI, Transformers and Attention Mechanism, Quantization of Neural Networks, Sparse Neural Networks, Model Optimization for Edge, Fine-Tuning LLMs
Time Series Analysis / Statistics:	ARIMA, SARIMA, GARCH, Exponential Smoothing, Gibbs sampling, MCMC, PCA, SVD, A/B testing, ANOVA analysis

PAPERS, AWARDS AND RECOGNITIONS

- **Shakya, A.*, Ghosh, D.B., Jackson, C., Morra, G., Karki, B.B. (2024). Insights into core-mantle differentiation from bulk Earth melt simulations. Scientific Reports. DOI: 10.1038/s41598-024-69873-8.**
- Shakya, A.*, Pokharel, A., Bhattarai, A., Sitikhu, P., Shakya, S. (2018). Real-Time Stock Prediction Using Neural Network. 8th International Conference, Confluence 2018— IEEE. ISBN: 978-1-5386-1720-5.
- Talk on "Stock Market Prediction using Neural Networks" at Kelaniya International Conference on Advances in Computing and Technology held in Srilanka
- Enrolled in a fully Funded PhD Program : NASA Emerging Worlds Research Grant, Computer Science, LSU, 2021/22
- Enrolled in a fully funded Bachelor's Program: Merit based scholarship for securing 26th Rank in Engineering Entrance Examination (From a pool of 15000+ applicant)