ABIN SHAKYA

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EDUCATION

Louisiana State University, Baton Rouge *Advisor: Dr. Bijaya Karki*
PhD in Computer Science : 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*

- **Working on Graph Neural Network accelerated Molecular Dynamics to get insight on atom distribution inside the core of Earth.**
- Designed and constructed deep learning-based potential energy models for molecular dynamics applications, enabling unprecedented simulations of Earth's interior and drafted the paper **Computer Simulation and Analysis of bulk earth melt system: Insight into core-mantle differentiation.**
- **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.**
- Navigated intricate computational geometry problems, which included activities such as manipulating 3D convex hulls and alpha shapes, seamlessly incorporating them into molecular dynamic applications. This enhanced representation of geometric solutions which significantly improved our understanding of molecular interactions.
- Developed indexing algorithms that empower efficient queries on compressed data, resulting in optimized data retrieval processes. This innovation directly contributed to the increased speed and effectiveness of data analysis.

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

- Worked as a Backend Engineer **(Python/Django)** in architecting a comprehensive Digital Wallet Ecosystem.
- Streamlined daily operations by automating tasks to support the finance team in reconciliations.
- Exhibited an exceptional level of technical prowess while delivering top-tier L3 support, effectively taking charge of and skillfully mitigating complex issues as they arose, ensuring seamless operations.
- **Successfully migrated code base from Django 1.8 to Django 2.2, ensuring modern and efficient framework utilization.**
- Enhanced flight search engine efficiency by strategically implementing caching and parallelization techniques.

SKILLS

Programming Language:	**Python**, **R**, JAVA, C, C++, SAS, SQL, MATLAB
Frameworks/Libraries:	**Pytorch, Tensorflow**, MLX, Django/DRF, PySpark, Keras, Pandas, Numpy, Scikit-Learn, Matplotlib, PyMC3, HPC, Seaborn
Tools, Technologies, DB:	PostgreSQL, MongoDB, SparkSQL, PySpark, Apache Kafka, Apache Hadoop Amazon S3, Nginx, Redis, RabbitMQ, Latex
ML skills:	**Graph Attention Networks, Bayesian Neural Networks**, Diffusion Models, Sparse Neural Networks, Quantization of Neural Networks, Fine-Tuning LLMs
Time Series Analysis / Statistics:	ARIMA, SARIMA, GARCH, Exponential Smoothing, Gibbs sampling, MCMC, RNN, LSTM, Transformer, 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)