Gaurab Baral

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Education

Northern Kentucky University Aug. 2022 – Present
Undergraduate in Data Science, Minoring in Statistics and Biological Science *Highland Heights, KY*

- **Relevant Courses:** Calculus, Advanced Statistics, Data Mining in Python, Data Cleaning and Visualization, Regression Analysis, Artificial Intelligence, Statistical Computing, Big Data
- **Awards/Honors:** L.I.F.E Fellowship, International Merit Scholarship, President's Honor List
- **Organizations:** Data Science Club(President), COI Ambassadors, STEM Peer Mentor, ACM NKU

Experience

Statistical Consultant Aug 2025 – Present
Burkardt Consulting Center *Highland Heights, KY*

- Conducted statistical analyses (Regression, ANOVA, Hypothesis Testing) to uncover patterns and support decision-making.
- Developed reports and dashboards to deliver actionable insights for DNP projects, ensuring data accuracy and timely feedback.

Undergraduate Research Fellow May 2023 – Present
Northern Kentucky University *Highland Heights, KY*

- Published research on Recommendation Systems (ICMI 2025), Drowsiness Detection (ICMI 2025, AIBThings 2025), Complex Regression Analysis (AHFE 2024, ICCIDA 2025), and Job Market Analysis (KCFC 2024).
- Presented 2 times at Kentucky Capitol Poster Celebration and 3 times on NKU Research Celebration events.

Data Science Intern May 2025 - August 2025
Re-Assist *Remote*

- Used OpenCV and AWS Textract to extract fields from scanned medical forms; applied Google Gemini to understand and fill the fields intelligently.
- Built a FastAPI-based PDF auto-filler in Python; packaged with Docker and deployed serverlessly using AWS EC2.

Teaching Assistant Jan. 2023 – Jan. 2025
College of Informatics - Northern Kentucky University *Highland Heights, KY*

- Assisted in teaching Python Programming (Fall 2023) and Data Science (Fall 2024), supporting students through tutoring, labs, reviews, and grading.
- Served as a Statistics Teaching Assistant at the Mathematics and Statistics Lab.

Projects

Driver Drowsiness Detection | *Python, Streamlit, OpenCV, TensorFlow*
* Developed a real-time driver drowsiness detection system using OpenCV and TensorFlow
* Integrated facial landmark detection and eye-blink monitoring to identify signs of fatigue
* Built an interactive dashboard with Streamlit for visualizing detection metrics and results
* Designed the system to trigger alerts when drowsiness is detected, ensuring enhanced road safety

Virtual Teaching Assistant | *Python, React, NodeJS, Pinecone, OpenAI API*
* Built a Retrieval-Augmented Generation (RAG) system for two graduate level cybersecurity courses at NKU.
* Implemented document chunking, vector embeddings, and semantic search for efficient information retrieval.
* Developed a user-friendly interface for querying course requirements, schedules, and policies in real-time.

Technical Skills

Languages: Python, Java, SQL, R, SAS, Git, MATLAB
Libraries/Frameworks: Pandas, Numpy, Matplotlib, TensorFlow, PyTorch, LangChain,FastAPI, Docker, Hadoop

Publications:

Baral, G. & Zhou, J. (2024). "A Hybrid Regression Method for Predicting Housing Prices." AHFE International Conference, AHFE Open Access, vol 159. DOI: 10.54941/ahfe1005725

Baral, G. & Zhou, J. (2024). "A Data-Driven Analysis of Cybersecurity Job Market Trends." Proceedings of the Kentucky Cybersecurity & Forensics Conference (KCFC 2024). DOI: 10.13140/RG.2.2.20788.92802.

Baral, G.,Shrestha, S., Shrestha, A., Lama, N., Zhou, J. (2024). "Drowsiness Detection Using Convolutional Neural Network with Eye Feature Analysis. IEEE 4th International Conference on Computing and Machine Intelligence. DOI: 10.1109/ICMI65310.2025.111411185.

Baral, G. & Zhou, J. (2024). "Exploring Movie Recommendation Systems: A Text Mining based Overview. IEEE 4th International Conference on Computing and Machine Intelligence. DOI:10.1109/ICMI65310.2025.11141109.

Baral, G. & Zhou, J. (2025). "Forecasting Sticker Sales: A Comprehensive Analysis Using Regression Models." Proceedings of the 4th International Conference on Computing, IoT and Data Analytics . (Upcoming publication)

Baral, G., Sah, M., Khanal, A., Dhonju, A., & Shrestha, S. (2025). "AutoEyeFT: A Human-in-the-Loop Continuous Learning Pipeline for Robust Drowsiness Detection via Eye Region Analysis " Proceedings of the International Conference on Artificial Intelligence, Blockchain, and Internet of Things . (Upcoming publication)

Baral, G., Sah, M., Khanal, A., Dhonju, A., & Shrestha, S. (2025). "Enhancing Emotion Classification with Human-in-the-Loop Verification for Facial Expression Recognition" Proceedings of the International Conference on Artificial Intelligence, Blockchain, and Internet of Things . (Upcoming publication)

Posters:

Baral, G., 2024. A Survey on Movie Recommendation: from a machine learning perspective.

Baral, G., Zhou, J., Tao, Y., Jiang, H. and Zhang, X., 2025. A Data-Driven Analysis of Trends in the Artificial Intelligence Job Market.