

Suramya Pokharel

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EDUCATION

Thapathali Campus, Tribhuvan University, Kathmandu, Nepal
B.E., Electronics, Information and Communication Engineering
Percentage: 78.04%
Scholarship: Merit-based semester-wise stipend (5/8 times)

Nov 2019 – Apr 2024

RESEARCH AND PROJECTS

1. “A Mobile Surveillance System with Face Detection and Recognition Abilities” | *Paper based on a previous Academic Project*

- Designed and implemented a mobile surveillance system using Arduino UNO, enabling autonomous movement within a specified area while detecting and recognizing faces in real-time.
- Utilized Haar-cascades for face detection and integrated the pre-trained FaceNet model for face recognition.
- Simulated and aided in implementation of the electronic configuration required for the hardware mechanism
- Conducted rigorous testing of the face detection and recognition systems under different lightings and configurations.
- Wrote majority of the full manuscript and successfully presented the paper.

Supervisor: Er. Suramya Sharma Dahal | April 2024 - July 2024 | Status: Published (<https://doi.org/10.3126/kjse.v8i1.69257>)

2. “PuzzleFlow: Solving Jigsaw-Like Puzzles with Transformer-Powered Flow-Based Architecture” | *Final Year Project (B.E.)*

- Designed a new approach to solve Jigsaw-like puzzles by integrating a flow-based mechanism with vision transformer-inspired architecture for accurate and efficient piece alignment.
- Preprocessed and augmented the dataset ensuring diversity and robustness of data and implemented the proposed architecture using Python and Pytorch.
- Continuously optimized the proposed model by architecture pruning, quantizing weights and activations, experimenting with different hyperparameters and so on.
- Conducted in-depth analysis of model performance and thoroughly documented and defended the project.
- Plans to author a paper detailing the mechanism, results and key findings of the project underway.

Supervisor: Er. Suramya Sharma Dahal | Jun 2023 – Apr 2024 | Status: Completed

3. Implementation of various ML algorithms on several different datasets | *Independent Projects*

- Applied fundamental machine learning algorithms like Decision Trees, KNN, K-Means Clustering, Naïve Bayes and custom designed Artificial Neural Network on varieties of datasets like Iris, Stellar Classification, Haberman’s survival etc.
- Explored each involved step in depth, experimenting with plenty of initialization techniques, data pre-processing techniques, separation criterion etc., all while making thorough analysis of the underlying theories involved.
- Visualized datasets and results using tools like Matplotlib and Seaborn to gain insights into feature importance and algorithms’ performances.

- Conducted comparative analysis of each algorithm's performance by varying hyperparameters and evaluating metrics in the classification report.
- Documented the entire processes and theories involved for each mini-project and wrote complete manuscripts

Advisor: Er. Dinesh Baniya Kshatri | Jun 2023- Aug 2023 | Status: Complete (Manuscripts: [Link](#))

WORK EXPERIENCE

AI/ML Engineer | *ICEBRKR AI*

Mar 2024 – Sept 2024

- Fine-tuned multiple LLMs, including variants of BERT, BART, GPT and Spacy models for a wide range of downstream tasks including text to text generation, text classification, text summarization.
- Employed text embedding models like Word2Vec and sentence transformers for similarity calculations, optimizing tasks like ad recommendation using efficient methods like FAISS.
- Implemented various lightweight algorithms tailored for real-time applications, ensuring good performance and low computational overhead.
- Created end points for trained and fine-tuned models, as well as other algorithms using the FastAPI framework.
- Documented the workflows and approaches taken for implementation of any particular feature.

SKILLS

Languages: Python, C, C++, Java, R, SQL

Libraries: Pandas, NumPy, OpenCV, Matplotlib, Seaborn, scikit-learn, Tensorflow, Pytorch, NLTK, SpaCy, FastAPI, LangChain, Streamlit

Tools: HTML, CSS, LaTeX, Linux, GIT, MATLAB

TEST SCORES

1. **GRE:** 167Q, 155V; Total = **322/340 with 4.5/6** in AWA
2. **IELTS:** 9.0R, 9.0L, 7.5S, 7.5W; Total = **8.5/9.0**.

COMPETITIONS

1. Hitachi Locus Technergy 2024

Award: **Best Coding and Presentation Award** (out of 40+ different teams) for our approach to encrypt data at rest using TDE and AES algorithm.

2. LOCUS Hack A Week Competition 2024

Ranking: **Finalist** in the Gen AI category for developing an AI generated game containing AI generated audio, images and plot.

3. Kathfest Nationwide Hackathon

Ranking: **Finalist** for developing a deep-fake detector for images and video