

Nisan Chhetri

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SUMMARY

- 4th-year Ph.D. Candidate in Computer Science advancing machine learning for pattern recognition and risk assessment, with research spanning novelty detection in visual data and predictive biosystem modeling. Combines expertise in Python, PyTorch, and large-scale data analysis with a rigorous approach to solving real-world problems through ML-driven solutions.

EDUCATION

- **Ph.D. in Computer Science, North Carolina State University, Raleigh, NC** *Aug 2021 – Dec 2025 (Expected)*
Thesis title: Modeling Creativity Dimensions to Estimate Image Creativity
- **MS in Computer Science, North Carolina State University, Raleigh, NC** *Aug 2021 – May 2024*
Courses: Data Structures and Algorithms, Artificial Intelligence, Data Mining, Neural Networks, Efficient Deep Learning, Software Engineering, Accelerated Deep Learning, Advanced Machine Learning
- **Bachelor of Engineering in Electrical, Tribhuvan University, Nepal** *Aug 2014 – Dec 2018*
Courses: C, C++, Signal Processing, Microprocessor, Probability and Statistics, Artificial Neural Network

PUBLICATIONS

- **Chhetri, N., Sainju, A. (2025).** PromptIQ: Who Cares About Prompts? Let System Handle It – A Component-Aware Framework for T2I Generation. *In Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI)* **Status: submitted.**
- **Chhetri, N., Summers, K. L., Campos, P., Postnikova, O., Rivera, I., Harlow, K., Oliver, W., Wells, J. E., Pirone Davies, C. (2024).** The Role of the Mycobiome in Growth of the Pre-wean Pig, *Sus scrofa*. *Journal of Animal Science*. **Status: submitted.**
- Rivera, I., Harlow, K., Cole, R. N., O'Meally, R., Garrett, W., Xiong, W., Oliver, W., Wells, J. E., Summers, K. L., **Chhetri, N.,** Postnikova, O., Ramsay, T., Pirone Davies, C. (2024). A metaproteomic analysis of the piglet fecal microbiome during the weaning transition. *Frontiers in Microbiology*. **Status: submitted.**

TECHNICAL SKILLS

- Languages/Tools: Python, C, C++, Bash, Git, Linux, AWS, MySQL, Jupyter, Gradio, MLflow
- ML/AI: Supervised & Unsupervised Learning, Optimization, GANs, Transformers, LLMs, Creative AI, Computer Vision, EDA
- Frameworks/Libraries: PyTorch, TensorFlow, Keras, Sklearn, Pandas, NumPy, Matplotlib, Plotly, OpenCV

WORK EXPERIENCE

- **Research Assistant, Knowledge Discovery Lab, Raleigh, NC** *Mar 2020 - Present*
 - Ongoing Work: Designing a deep learning framework to estimate creativity scores using three foundational psychological dimensions: Novelty, Surprise, and Value.
 - Initial Findings: Identified Novelty and Arousal as key creativity dimensions in images from a survey of 10 participants.
- **Teaching Assistant, NC State University, Raleigh, NC** *Aug 2021 - Present*
 - Technical Communication TA: Mentoring 8 teams on data-driven projects by providing feedback on slides, presentation skills, and reports.
 - C programming, AI, and Discrete Mathematics: Prepared 3 lectures, 2 projects, and 10 exercises. Proctored 2 exams. Graded 2 exams and 6 projects of 240 students.
- **AI/ML Research Intern, US Department of Agriculture-ARS, Beltsville, MD** *May 2023 - Aug 2023, Dec 2023 - Aug 2024*
 - Applied ML pipelines to large-scale microbiome datasets, identifying *Candida*, *Kazachstania*, and *Clavispora* as key fungal features linked to swine growth outcomes.
 - Built 5 supervised ML models with clr-transformed data, identifying Day 21 fungal taxa as primary predictors.
- **Machine Learning Engineer, Fusemachines Inc., Nepal** *Dec 2019 - Jul 2021*
 - AI in Education: Created 10 courses and 5 projects for 4 colleges on RL, ML, CV, NLP, and DL topics. Trained 3 interns.
 - AI in Industry: Developed an intrusion detection system (1 TB traffic) with autoencoders achieving 89% accuracy; automated malware IP detection saved \$1M+.
- **Artificial Intelligence Intern, Paaila Technology, Nepal** *Mar 2019 - Nov 2019*
 - Improved accuracy of existing chatbot systems by 6% by building Nepali-Romanizer tool and increased 3 new clients.

PROJECTS

- **Image Generation via Prompt-Based Guidance [Ongoing work]**, Colab project, NC State and MTSU *May 2024 - Present*
LLMs, Text-to-image, Prompt Engineering, Benchmarks [Tech: GPT, PyTorch, CUDA, Google colab]
 - Developing a **user-driven T2I framework** using **prompt engineering**; discovered major limitations in **diffusion-based models** for complex object generation.
 - Built a Gradio/**web-based dashboard** to visualize outputs and facilitate subjective feedback on image quality.
- **Few-shot Learning for Energy Detection**, Course project, Advance ML, NC State, *report link* *Jan 2023 - May 2023*
Few-shot Learning, Computer Vision, Object Detection [Tech: Parallel computing, PyTorch, CUDA]
 - Constructed a **few-shot learning model** to detect energy infrastructure (nuclear, solar, hydro) in aerial imagery.
- **Evaluation of various BERT algorithms**, Course project, Efficient DL, NC State, *report link* *Aug 2022 - Dec 2022*
LLMs, GLUE Dataset, Generative AI [Tech: Google Colab, PyTorch, CUDA, transformer]
 - Evaluated 5 **BERT** models across 8 GLUE tasks, identifying **BERT Uncased** as the top performer.
- **EcoNet Weather Forecasting**, Course project, Data Mining, NC State, *report link* *Feb 2022 - May 2022*
Machine Learning, Time-series forecast, Feature Engineering [Tech: Python, Sklearn, PyTorch, Seaborn]
 - Achieved up to **99% recall** with CatBoost out of 5 different ML models. **Ranked 1st** in class of 25 groups.
- **Pneumonia Detection**, Course project, Neural Networks, NC State, *report link* *Oct 2021- Dec 2021*
Deep Learning, Computer Vision, Image data [Tech: Python, Colab, Pydicom, Keras, Pandas, Matplotlib]
 - Implemented DenseNet model to detect pneumonia with bounding boxes, reaching **80% accuracy**.
- **Terrian Classification**, Course project, Neural Networks, NC State, *report link* *Aug 2021 - Nov 2021*
 - Trained a model with **CNN and LSTM** using time-series data up to **93% accuracy** on the test set to improve robotic limb.

LEADERSHIP EXPERIENCE

- NCSU Global Summer Research Program, NC State University, NC, *presentation link* *Jun 2022 - Aug 2022*
 - Mentored 2 undergraduate students on **creativity-based research**; placed **3rd out of 15** research groups.
- Trainer - C programming, Tribhuwan University, Nepal *Jan 2017 - Feb 2017*
 - Conducted 6 **C programming** foundation hackathon sessions with over 200 students and assisted with 2 projects.

AWARDS AND FELLOWSHIPS

- **USDA Research Fellowship** (2023)
- **Summer Graduate Fellowship** (2022)
- **Title Winner** of Games and Entertainment (2017) (*link*)