Bikram Khanal

bikram_khanal1@baylor.edu jeonbik Bikram Khanal
Bikram Khanal Bikram Khanal

CAREER PROFILE

I am a Machine Learning and Quantum Computing Ph.D. candidate with an analytical mind and the ability to break down and solve complex problems. I have sound foundational knowledge in Quantum Computing, Machine Learning, Deep Learning, and Quantum Machine Learning algorithms. I have worked on various projects in the fields of Adversarial Machine Learning, Program Synthesis, Fairness and Robustness, and Natural Language Processing. I have strong communication skills and a strong mathematical foundation for learning from data. I have an ability to learn new concepts and technologies quickly with a consistent record of meeting project deadlines.

Education

2020 – present **Ph.D. Computer Science, Baylor University**, Waco, TX, USA
Dissertation title: *Generalization Error Bound for Quantum Machine Learning in NISQ Era.*

2020 – 2023 **M.Sc. Computer Science, Baylor University**, Waco, TX, USA
Focus: *Machine Learning, Quantum Machine Learning, NLP.*

2016 – 2020 **B.Sc. Computer Science, Troy University**, Troy, AL, USA
Core Courses: *Machine Learning, Databases, Algorithms, Software Engineering, Networking, Cryptography, Advance Calculus, Advance Statistics, Introduction to Computer Science.*

Experience

2020 - Present **Research/Teaching Assistant,** Baylor University.

1. Assisted in the development and management of a tissue bank for alcohol research, specializing in bioinformatics, tissue tracking, and data integration across species and experimental protocols.
2. Conducted research on the effects of alcohol on monkey lungs and contributed to the understanding of respiratory diseases caused by alcohol consumption.
3. Successfully maintained and updated a Django-based website, ensuring its smooth functioning and seamless user experience. This involved regular uploading and manipulation of data in PostgreSQL while adhering to strict quality and security standards.
4. Conducted extensive data analysis to track and monitor changes in the health of non-human primates, driven by their drinking schedules. Utilized advanced statistical techniques to identify patterns and correlations, and provided valuable insights to the research team.

Experience (continued)

TA Courses
Assisted courses in C++ and Python Programming, Computer Architecture, Computing and Computer Fundamentals, and Algorithms, to enhance student comprehension through lab tutorials and assessment development. My role involved close collaboration with professors in assignments and exam design and direct support to students, contributing to improved academic outcomes in Computer Science and Data Science courses.

Nov 2022 — **Participant,** Gemini Autumn School on Quantum Computation
Lectures and talks by leading experts in quantum computing, quantum error correction, and quantum information theory.

July 2022 — **Participant,** SQMS/GGI Summer School on Quantum Simulation of Field Theories
Lectures and hands-on programming experience on Quantum Machine Learning.

Research Publications

Journal Articles

1. B. Khanal, J. Orduz, P. Rivas, and E. Baker, "Supercomputing leverages quantum machine learning and grover's algorithm," *The Journal of Supercomputing*, vol. 79, no. 6, pp. 6918–6940, 2023.

Conference Proceedings

1. B. Khanal and P. Rivas, "Evaluating the impact of noise on variational quantum circuits in nisq era devices."
2. B. Khanal and P. Rivas, "Kernels and quantum machine learning."
3. K. S. B. K. P. Rivas, "On adversarial examples for text classification by perturbing latent representations."
4. A. Sanjel, B. Khanal, and P. Rivas, "Non-invasive muzzle matching for cattle identification using deep learning."
5. K. Sooksatra, B. Khanal, P. Rivas, and D. R. Schwartz, "Attribution scores of bert-based sql-query automatic grading for explainability."
6. B. Khanal, P. Rivas, and J. Orduz, "Human activity classification using basic machine learning models," in *2021 International Conference on Computational Science and Computational Intelligence (CSCI)*, IEEE, 2021, pp. 121–126.
7. B. Khanal, P. Rivas, J. Orduz, and A. Zhakubayev, "Quantum machine learning: A case study of grover's algorithm," in *2021 International Conference on Computational Science and Computational Intelligence (CSCI)*, IEEE, 2021, pp. 79–84.

Books and Chapters

1. P. Rivas, C. Thompson, B. Tafur, *et al.*, "Ai ethics for earth sciences," in *Artificial Intelligence in Earth Science*, Elsevier, 2023, pp. 379–396.

SELECTED PROJECTS

June - Oct 2023 — **Automated Synthesis of Distributed Code from Sequential Snippets**
Created two comprehensive datasets containing 10k and 100k sequential code snippets paired with their corresponding PySpark API calls and automated the production of PySpark API calls from Python snippets.

May-Aug 2023 — **Noise impact in Quantum Circuit**
Conducted an in-depth analysis of quantum variational classification in the NISQ era, assessing the impact of noise on feature maps and VQCs and identifying robust quantum circuit designs for complex tasks amidst quantum noise challenges.

Jan -May 2023 — **Muzzle Matching for Cattle Identification**
Developed non-invasive muzzle matching to address the challenges in insurance fraud and animal trading markets.

May-Dec 2022 — **Adversarial Examples for Text Classification By Perturbing Latent Representation**
Created a framework that measures a text classifier's robustness using the classifier's gradients

Aug - Dec 2021 — **Up-to-date Publication Embedding**
Developed an embedded JavaScript library that automates the publication of researchers up-to-date.

Jan 2020 — **iBlink**
An application that types characters in a computer based on the blink of an eye. The application captures the Morse code from the eyes blinking and converts it into text using Computer Vision.

Nov 2019 — **Hand Gesture Navigation**
An application that gives commands to the system based on hand gestures captured from the computer webcam.

Relevant Courses

- **Core Courses**: Machine Learning, Data Mining, Natural Language Processing, Advanced Database, Cloud Computing, Quantum Computing, Theory of Computation, Advanced Algorithms.
- **Online Courses**: Deep Learning Specialization (Coursera), Django Essential Training (LinkedIn Learning), Xanadu Codebook, Qiskit Machine Learning Course (Qiskit website), Qiskit Summer 2020 (YouTube).

Skills

Languages	Strong reading, writing, and speaking competencies in English, Nepali, Hindi, and Intermediate Spanish.
Coding	Python, Java,C++, LaTeX
Databases	MySQL, PostgreSQL, HSQL, SQLite, MongoDB
Web Dev	HTML, CSS, Django, NginX.
Frameworks	TensorFlow, Pytorch, Transformers, Sklearn, Pandas, Numpy, Django, Qiskit, Pennylane

Skills (continued)

Tools — VS Code, Pycharm, Docker, Jupyter, UNIX, Git

Misc. — Academic research, teaching, training, LaTeX typesetting and publishing, Public Speaking.

Leadership Experience

March 2019 – May 2020 — **President, Troy Nepalese Student Association**
Troy University, Troy, AL, USA
Conducted meetings and annual Nepali cultural exhibits at various university events.

April 2014 – August 2015 — **Lumbini Expansion Director, National Support Team-AIESEC Nepal**
Lumbini, Nepal
Expanded AIESEC Nepal branch in Lumbini. Responsible for conducting meetings with local NGOs and INGOs to explore possibilities of an exchange program.

Volunteer Experience

Dec 2022 — **Conference Volunteer, NeurIPS**
Checking in people at the registration desk and collaborating with workshop chairs for the smooth conduct of workshops.

Sep – Nov 2018 — **Referee, Troy University Best Robotics**
Helping high school students to exhibit their work in the competition.

Aug 2015 — **Event Volunteer, AIESEC International Congress**
Assisting the organizers in various tasks for the efficient execution of the event.

Jun – Aug 2014 — **Exchange Student, AIESEC in Thailand**
Cross-cultural exchange student from AIESEC in Nepal.

References

Available on Request