Anuj Pokhrel

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Research Interests

I'm a PhD candidate, advised by Dr. Xuesu Xiao. I am interested in developing robust perception and planning algorithms and applying Deep Learning/Machine Learning for effective maneuverability in challenging off-road terrain.

Education

George Mason University — *Fairfax, VA*
Ph.D. student in Computer Science — *Jan 2021 – Dec 2026 (Expected)*
- **Research Focus:** Model based approach for off-road navigation.

George Mason University — *Fairfax, VA*
Master of Science in Computer Science — *May 2025*

Tribhuvan University — *Kathmandu, Nepal*
Bachelors in Computer Engineering — *Sep 2017*

Publications

Peer-reviewed Papers

Anuj Pokhrel, Mohammad Nazeri, Aniket Datar, and Xuesu Xiao. **CAHSOR: Competence-Aware High-Speed Off-Road Ground Navigation in SE(3)**. *Robotics and Automation Letters (RA-L)*, 2024.

Anuj Pokhrel, Aniket Datar, and Xuesu Xiao. ***Dom, cars don't fly!—Or do they?* In-Air Vehicle Maneuver for High-Speed Off-Road Navigation**. *International Conference on Intelligent Robots and Systems (IROS), 2025.*

Anuj Pokhrel, Aniket Datar, Mohammad Nazeri, Francesco Cancelliere, and Xuesu Xiao. **Zero-Shot Adaptation to Robot Structural Damage via Natural Language-Informed Kinodynamics Modeling**. 2026 **(Under Review)**.

Aniket Datar, **Anuj Pokhrel**, Mohammad Nazeri, Madhan B. Rao, Chenhui Pan, Yufan Zhang, André Harrison, Maggie Wigness, Philip R. Osteen, Jinwei Ye, and Xuesu Xiao. **M2P2: A Multi-Modal Passive Perception Dataset for Off-Road Mobility in Extreme Low-Light Conditions**. *International Conference on Intelligent Robots and Systems (IROS), 2025.*

Mohammad Nazeri, **Anuj Pokhrel**, Alexandyr Card, Aniket Datar, Garrett Warnell, and Xuesu Xiao. **VertiFormer: A Data-Efficient Multi-Task Transformer for Off-Road Robot Mobility. (Under Review)**.

Amirreza Payandeh, **Anuj Pokhrel**, Daeun Song, Marcos Zampieri, and Xuesu Xiao. **Narrate2Nav: Real-Time Visual Navigation with Implicit Language Reasoning in Human-Centric Environments.** *(International Conference on Robotics and Automation)*, 2025.

Mohammad Nazeri, Aniket Datar, **Anuj Pokhrel**, Chenhui Pan, Garrett Warnell, and Xuesu Xiao. **Verticoder: Self-Supervised Kinodynamic Representation Learning on Vertically Challenging Terrain**. *International Conference on Robotics and Automation*, 2025.

Chenhui Pan, Aniket Datar, **Anuj Pokhrel**, Matthew Choulas, Mohammad Nazeri, and Xuesu Xiao. **Traverse the Non-Traversable: Estimating Traversability for Wheeled Mobility on Vertically Challenging Terrain**. 2025 **(Under Review)**.

Aniket Datar, Chenhui Pan, Mohammad Nazeri, **Anuj Pokhrel**, and Xuesu Xiao. **Terrain-Attentive Learning for Efficient 6-DoF Kinodynamic Modeling on Vertically Challenging Terrain**. *International Conference on Intelligent Robots and Systems (IROS)*, 2024.

Tong Xu, Chenhui Pan, Madhan B. Rao, Aniket Datar, **Anuj Pokhrel**, Yuanjie Lu, and Xuesu Xiao. **Verti-bench: A general and scalable off-road mobility benchmark for vertically challenging terrain**. *Robotics: Science and Systems (RSS), 2025.*

Research & Work Experience

George Mason University RobotiXX Lab — *Fairfax, VA, USA*
Graduate Research Assistant — *Jan 2023 - Present*
- Advisor: Dr. Xuesu Xiao

George Mason University *Fairfax, VA, USA*

Graduate Teaching Assistant

- Teaching Assistant:
  - (Spring 2021) Introduction to Low-Level Programming (CS 262) & Essentials of Computer Science (CS 110)
  - (Fall 2021) Introduction to Cryptography (CS587/CS487)
  - (Spring 2022) Blockchains and Cryptofinance (CS 499)
  - (Fall 2023) Secure Programming and Systems (CS 468)
  - (Fall 2024) Introduction to Data Mining (CS 584)

Los Alamos National Laboratory *Los Alamos, NM, USA*

Intern: Applied Machine Learning School *Jun 2022 - Aug 2022*

- Developed a semi-supervised BERT-based Named Entity Recognition (NER) model for explainable topic analysis of materials science research. The model analyzed titles of published papers, extracting key entities and enabling researchers to understand research trends in a more interpretable way. Additionally, a web application was built to facilitate user interaction and efficient extraction of NERs from the dataset, using the developed model in the backend.

Tekvortex Pvt. Ltd. *Lalitpur, Nepal*

Full Stack Software Developer *Jan 2018 - Dec 2020*

- Projects:
  - Worked on the design and development of CloudChomp, a web application that streamlined the AWS migration for organizations, utilizing Ruby on Rails for the back-end, AngularJS for the front-end, and a Postgres database.
  - Designed, developed, and implemented custom Salesforce applications for various organizations, leveraging my expertise in Apex, Visualforce, and Lightning Web Components.

Professional Service

Peer Reviewer

IEEE Transactions on Robotics (T-RO)

IEEE Transactions on Field Robotics (T-FR)

Conference on Robot Learning (CoRL)

IEEE Robotics and Automation Letters (RA-L)

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Honors & Awards

- 1st Place, Raytheon Autonomous Vehicle Competition, 2024.

Press Coverage

- **The Washington Post** - Highlited as a key student utilizing the new Fuse building's robotics and AI labs to advance Virginia's tech talent pipeline, 2025.

Languages

English	Professional proficiency
Nepali	Native proficiency
Hindi	Medium proficiency

References

Dr. Xuesu Xiao (xiao@gmu.edu)

Assistant Professor
Dept. of Computer Science (CS)
George Mason University
4400 University Dr, Fairfax, VA 22030

Dr. Manish Bhattarai (ceodspspectrum@lanl.gov)

Staff Scientist
Los Alamos National Laboratory
Los Alamos, NM 87545