Roshan Dhakal

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EDUCATION

George Mason University, Fairfax, Virginia, USA

- Ph.D. in Computer Science — Aug 2018 – Aug 2026
  - Thesis: Enhancing long-lived robot task and motion planning via learning-augmented anticipatory planning.
  - Adviser: Prof. Gregory J. Stein
  - Focus: Robotics, Task and Motion Planning, Learning Augmented Planning, Commonsense Planning
- M.S. in Computer Science — Aug 2018 – May 2021
  - Cumulative GPA: 3.7 / 4.0

Tribhuvan University, Pokhara, Nepal

- Bachelors of Engineering in Computer Engineering — 2012 – 2016

EXPERIENCE

George Mason University, Department of Computer Science

- Graduate Research Assistant — May 2021 – Present

  Research on developing learning augmented task and motion planning that enables robots to act intelligently in the environment by anticipating the future, even with missing information. I implement learning-based cost models using neural network for decision-making under uncertainty over future, supported by modern software engineering with CMake, Docker, and modular pipelines for scalable, reproducible experimentation. My research advances the integration of classical robot planning and machine learning toward life-long autonomy.
- Graduate Teaching Assistant — May 2021 – Dec 2025

  Supported courses in AI, data mining, programming, and networking. Assist with LLM-based AI projects, Python development, and networking labs using TCP/IP, UDP, and Wireshark. Emphasized applied problem-solving, software engineering, and technical communication across diverse computing domains.

Pokhara Engineering College, Nepal,

- Information Technology Lecturer — Jan 2018 – May 2018

  Mentored and Tutored Computer Engineering students at undergrad level for Computer Science course dealing with Computer Application and Fundamentals as well as Database Management System with Oracle SQL.

Kandara Tech, Pokhara, Nepal,

- Full-Stack Software Engineer — May 2017 – Apr 2018

  Architected and developed full-stack e-commerce application using Java and RESTful APIs, processing 100,000+ transactions per second with 99.9% uptime. Designed and maintained relational databases using SQL and MySQL, optimizing queries for high-traffic scenarios and ensuring data integrity. Created detailed software specifications, API documentation, and deployment guides for custom-built solutions, facilitating seamless handoffs and maintenance.

SELECTED PUBLICATIONS

JOURNALS

R. Dhakal, D. Nguyen, T. Silver, X.Xuesu, and G. J. Stein, "Anticipatory Task and Motion Planning: Improved Rearrangement in Persistent Continuous-Space Environments," in *in IEEE Robotics and Automation Letters (RA-L).* 2025

CONFERENCES

R. Dhakal, Md. R. H. Talukder, and G. J. Stein, "Anticipatory Planning: Improving Long-Lived Planning by Estimating Expected Cost of Future Tasks," in *IEEE International Conference on Robotics and Automation (ICRA).* 2023

PREPRINTS

A. Paudel, **R. Dhakal**, and S. Bhattarai, "Room Classification on Floor Plan Graphs using Graph Neural Networks," in *arXiv*. 2022

R. Dhakal "From Classical Planning to Learning-Based Task and Motion Planning: A Survey of Intelligent Planning Systems," in *TechRxiv*. 2021

SELECTED PROJECTS

- Integrating python-based custom heuristic in Fast Downward Planning System. *Tools Used: Python, C++, Docker, CMake* 2025
- Navigation Among Movable Obstacle using off the shelf Task and Motion Planning (TAMP) solver PDDLStream and Fast Downward planning system. *Tools Used: Python, TkInter, Docker, CMake* 2022
- Extended Kalman Filter (EKF) for Simultaneous Localization and Mapping (SLAM) with synthetic IMU dataset. *Tools Used: Python* 2022
- Comparison between reinforcement learning algorithms (Actor Critic and DQN) with Experience Replay on OpenAI Gym environment. *Tools Used: Python, PyTorch* 2021
- Depth map estimation from a single image using Encoder–Decoder and U-Net architectures. *Tools Used: Python, TensorFlow* 2020
- Student Survey Application using Angular2, RESTful Web Services, AWS Relational Database, S3, Lambda and API Gateway; deployed on Kubernetes with CI/CD. *Tools Used: Python, AWS, SQL* 2020
- Desktop chatbot using Artificial Intelligence Markup Language (AIML). *Tools Used: Java, AIML* 2016

AWARDS & RECOGNITION

- Dissertation Completion Grant, George Mason University. 2025/2026
- Provost Scholarship, George Mason University. 2025
- Outstanding Reviewer, CoRL Workshop on Learning Effective Abstractions for Planning (LEAP) 2024
- Travel Grant Award, IEEE International Conference on Robotics and Automation (ICRA) 2023
- Summer Research Initiation Award, George Mason University 2019

PROFESSIONAL AFFILIATIONS & ACTIVITIES

- Reviewer, IROS, ICRA, Robotics and Automation Letters (RA-L), CoRL LEAP
- CoMentor, Aspiring Scientists Summer Internship Program (ASSIP) 2022
- Volunteer, DMV Top 150 Networking Event, George Mason University 2020

SKILLS

TEX, LATEX, Python, C++, ROS, PyTorch, TensorFlow, OpenCV, OpenAI, SciKit, Pandas, NLTK, Jupyter Notebook, Node.JS, Angular, Springboot, Git, Docker, PDDL, Robot Operating System (ROS), MoveIt, Gazebo, PyBullet, RESTful API, SQL, MySQL, HTML/CSS, Linux/Ubuntu, Web, Windows, AWS EC2, AWS Lambda, MS Office