

# Abhishek Paudel

Fairfax, Virginia, USA  
abpaudel@outlook.com • <https://abpaudel.com>

<b>BIO</b>	Computer Science PhD student with research interests in the intersection of robotics and machine learning with a focus on planning under uncertainty.
<b>EDUCATION</b>	<p><b>George Mason University</b>, Fairfax, Virginia, USA PhD in Computer Science Aug 2019 – 2025 (Expected) <i>Research Interests: Robotics, Machine Learning, Planning under Uncertainty</i></p> <p><b>George Mason University</b>, Fairfax, Virginia, USA Master of Science in Computer Science Aug 2019 – May 2023 <i>Concentration: Machine Learning</i></p> <p><b>Tribhuvan University, Institute of Engineering</b>, Nepal Bachelor of Engineering, Computer Engineering Nov 2013 – Sep 2017 <i>Thesis: Personality-based Music Recommendation System</i></p>
<b>WORK EXPERIENCE</b>	<p><b>United Nations Children’s Fund (UNICEF)</b>, Nepal <i>Technical Consultant</i> Jan 2015 – Aug 2019</p> <ul style="list-style-type: none"><li>▪ Developed and deployed various SMS based applications along with real-time analytics.</li><li>▪ Provided technical support in development and deployment U-Report Nepal platform.</li><li>▪ Led the development and piloting of SMS based information dissemination and monitoring system for Nepal Government’s social security program.</li><li>▪ Drafted technological and programmatic strategy to implement mobile phone based technologies for youth engagement in policy process.</li></ul>
<b>RESEARCH &amp; TEACHING EXPERIENCE</b>	<p><b>George Mason University</b>, Fairfax, Virginia, USA <i>Graduate Research Assistant</i> May 2022 – Present Working on the intersection of robotics and machine learning with a focus on planning under uncertainty in the Robotic Anticipatory Intelligence and Learning (RAIL) Group. Ongoing research projects include developing techniques for deployment-time learning for navigation in unknown environments with reliability guarantees, and out-of-the box object-goal navigation with large language models (LLMs).</p> <p><b>George Mason University</b>, Fairfax, Virginia, USA <i>Graduate Teaching Assistant</i> Aug 2019 – May 2022 Affiliated with the Department of Computer Science in School of Engineering and Computing. Courses assisted: CS682 (Computer Vision), SWE637 (Software Testing), CS584 (Theory and Applications of Data Mining), CS262 (Introduction to Low-Level Programming), CS222 (Computer Programming for Engineers) and CS112 (Introduction to Computer Programming).</p> <p><b>MPercept Academy</b>, Nepal <i>Course Instructor</i> Jan 2019 – Jun 2019 Taught introductory course on machine learning and data science along with designing and evaluating assignments and projects.</p>
<b>SKILLS</b>	<p><i>Programming Languages:</i> Python, C/C++, C#, Java, JavaScript, MATLAB <i>Libraries &amp; Frameworks:</i> PyTorch, TensorFlow, Keras, scikit-learn, NumPy, pandas, matplotlib <i>Web &amp; Databases:</i> HTML/CSS, Django, Nginx, SQL, MongoDB <i>Tools &amp; Utilities:</i> Git, LaTeX, Docker, Unity3D, Robot Operating System (ROS), Make <i>Languages:</i> English, Nepali, Hindi</p>
<b>PEER-REVIEWED PUBLICATIONS</b>	<p><b>A. Paudel</b> and G. J. Stein, “Data-Efficient Policy Selection for Navigation in Partial Maps via Subgoal-Based Abstraction,” <i>2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)</i>, 2023.</p> <p><b>A. Paudel</b>, B. R. Bajracharya, M. Ghimire, N. Bhattarai and D. S. Baral, “Using Personality Traits Information from Social Media for Music Recommendation,” <i>2018 IEEE 3rd International Conference on Computing, Communication and Security (ICCCS)</i>, 2018.</p>

<b>SELECTED PROJECTS</b>	LLM-informed Object-goal Navigation	Ongoing
	A model-based planning approach for object-goal navigation in unknown indoor environments by leveraging image captioning model to describe the scene to a large language model (LLM) which then guides the robot towards most likely and efficient routes to the object instance. <i>Tools: Python, LLaMa 2, InstructBLIP</i>	
	Model-based Planning under Uncertainty with LoCoBot Robot	2023
	Developed automated training data collection pipeline for model-based planning for visual navigation in unknown indoor environments onboard the LoCoBot mobile robot hardware. <i>Tools: Python, Robot Operating System (ROS)</i>	
	Sentence-level Morpheme Segmentation	2022
	Developed and compared monolingual and multilingual approaches for sentence-level morpheme segmentation with sequence-to-sequence Transformer models. We show that multilingual approaches perform much better for low-resource languages. <i>Tools: Python, PyTorch</i>	
	Motion Primitives based Path Planning with RRT	2022
	An approach for generating kinodynamically feasible paths for a robot by leveraging motion primitives to capture the dynamics of the robot and using these motion primitives to build branches of the tree with Rapidly-exploring Random Tree (RRT). <i>Tools: Python</i>	
	Procedural Generation of 3D Office-like Environments	2022
	Developed procedurally generated office-like 3D simulation environments for robot navigation experiments using Unity3D game engine. <i>Tools: Python, Unity3D, C#</i>	
Room Classification on Floor Plan Graphs using Graph Neural Networks	2021	
An approach for improving room classification task on floor plan maps of buildings by representing floor plans as graphs and leveraging graph neural networks to predict room categories. <i>Tools: Python, PyTorch</i>		
Experimental Evaluation of Activation Functions in Neural Networks	2020	
An empirical study of how various activation functions like sigmoid, tanh, ReLU, leaky ReLU, ELU and SELU affect the training performance and convergence in neural networks. <i>Tools: Python</i>		
Monocular Depth Map Estimation	2020	
Estimation of depth map using single RGB image based on NYU Depth Dataset v2 and Active Vision Dataset with deep learning based methods. <i>Tools: Python, PyTorch</i>		
<b>AWARDS &amp; ACHIEVEMENTS</b>	Outstanding Graduate Teaching Assistant Award, George Mason University	2021
	Artificial Intelligence MicroMasters®, Columbia University	2019
	First Nepal AI Winter School Scholarship, NAAMII	2018
	Fusemachines Artificial Intelligence Fellowship	2017
	Microsoft YouthSpark Challenge for Change Award	2015
	Microsoft Student Partner	2014
<b>PROFESSIONAL AFFILIATIONS &amp; ACTIVITIES</b>	Reviewer, International Conference on Robotics and Automation (ICRA)	2024
	Co-Mentor, Aspiring Scientists Summer Internship Program (ASSIP)	2022 – 2023
	Judge, TJHSST Science and Engineering Fair	2023
	AI Fellow, Fusemachines	2018
	Facilitator, AI for Social Good Workshop, Kathmandu Mini Maker Faire	2018
	Software Coordinator, LOCUS National Technological Festival	2017
	Event Coordinator, Hult Prize @ Tribhuvan University	2017
	Participant, Asia-Pacific HLM3 Youth Innovation Challenge Workshop (Malaysia)	2016
	Speaker, Global Innovations for Children and Youth Summit (Finland)	2015
	Volunteer, Me to We Youth Volunteer Trip (Kenya)	2015