

# Duc M. Nguyen

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## Education

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|----------------------------------------------------|---------------------|
| George Mason University, Ph.D. in Computer Science | Aug 2022 – May 2027 |
| George Mason University, M.S. in Computer Science  | Aug 2022 – Dec 2024 |
| Miami University, B.S. in Computer Science         | Aug 2018 – May 2022 |
| • Minor in Statistics                              | GPA: 3.75/4.0       |

## Experience

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| <b>Research Assistant</b> , RobotiXX Lab – Fairfax, VA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Aug 2022 – Now         |
| <ul style="list-style-type: none"><li>Building neural network-based contact prediction system to enable failure-aware motion planning for home service robots in dynamic environments.</li><li>Implemented motion planning algorithms and collision checking interface in MuJoCo, improving experimental efficiency and enabling rapid prototyping for research team.</li><li>Developed and deployed ROS-based autonomous navigation and manipulation system for mobile manipulators (Fetch, Spot) supporting multi-room task execution.</li><li>Engineered open-source wearable egocentric sensor suite integrating multiple modalities (RGB, depth, IMU) for large-scale human motion data capture.</li><li>Led collection and curation of MuSoHu dataset covering <b>100 km</b>, <b>20 hours</b>, <b>300 trials</b>, and <b>13 participants</b> across diverse public spaces, resulting in IROS 2023 publication.</li></ul>                                                                          |                        |
| <b>Research Engineering Intern</b> , Johns Hopkins University – Baltimore, MD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | May 2025 – August 2025 |
| <ul style="list-style-type: none"><li>Led team adoption of NVIDIA Isaac Sim/Lab, building GPU-accelerated RL training infrastructure supporting <b>10,000+</b> parallel environments with vision sensors for Unitree Go2 quadruped navigation.</li><li>Designed bilevel hierarchical control architecture separating high-level navigation from low-level locomotion, trained using deep reinforcement learning (PPO) in PyTorch and deployed on physical robot via ROS2.</li><li>Enabled Matterport3D indoor environments in Isaac Sim by developing automated mesh processing and lighting injection pipeline to convert incompatible simulation platform assets.</li><li>Implemented multi-sensor suite (LiDAR, IMU, RGB camera) matching physical robot specifications and designed observation spaces and reward structures for neural network policy training.</li><li>Set up AprilTag localization system throughout lab to enable vision-based odometry correction for mobile robots.</li></ul> |                        |
| <b>Technical Lead</b> , Google Developer Group at GMU – Fairfax, VA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Oct 2024 – August 2025 |
| <ul style="list-style-type: none"><li>Organized and moderated a university seminar featuring a Google engineer, conducting a live interview.</li><li>Planned and coordinated annual Google Developer Group events at George Mason University.</li><li>Led hands-on workshops and student projects introducing Google Cloud technologies and applied machine learning tools.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |
| <b>Research Assistant</b> , Miami University – Oxford, OH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | May 2020 – Dec 2021    |
| <ul style="list-style-type: none"><li>Designed multi-agent deep reinforcement learning framework for cooperative UAV control under communication constraints, resulting in Springer book chapter publication.</li><li>Built machine learning models achieving <b>90%</b> accuracy for behavioral data classification and developed interactive visualization tools using NetworkX and JavaScript.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                        |

## Selected Publications

### Anticipatory Task and Motion Planning [\[PDF\]](#)

Roshan Dhakal, *Duc M. Nguyen*, Tom Silver, Xuesu Xiao, Gregory J. Stein  
Preprint, 2024

### Human Uncertainty-Aware MPC for Enhanced Human-Robot Collaborative Manipulation [\[PDF\]](#)

Al Jaber Mahmud, *Duc M. Nguyen*, Filipe Veiga, Xuesu Xiao, Xuan Wang  
IEEE 7th International Conference on Industrial Cyber-Physical Systems (ICPS), 2024

**Toward Human-Like Social Robot Navigation: A Large-Scale, Multi-Modal, Social Human Navigation Dataset** [\[PDF\]](#)

**Duc M. Nguyen**, Mohammad Nazeri, Amirrera Payandeh, Aniket Datar, Xuesu Xiao  
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2023

**Responsive Regulation of Dynamic UAV Communication Networks Based on Deep Reinforcement Learning**  
R. Zhang, **Duc M. Nguyen**, M. Wang, L. X. Cai, X. Shen  
Broadband Communications, Computing, and Control for Ubiquitous Intelligence. Wireless Networks. Springer, 2022

**Mapping the Complexity of Suicide by Combining Participatory Modeling and Network Science** [\[PDF\]](#)  
Phillipe J. Giabbanelli, Michael C. Galgoczy, **Duc M. Nguyen**, Romain Foy, Ketra L. Rice, Nisha Nataraj,  
Margaret M. Brown, Christopher R. Harper  
IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, 2021

## Projects

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### Energy-Based Diffusion Language Models for BabyLM

- Developing Energy-Based Diffusion Language Model (EDLM) combining discrete diffusion with sequence-level energy functions to improve sentence well-formedness on BabyLM benchmark dataset.
- Implementing compact diffusion model with contrastive learning objectives on **10M** word tracks, comparing performance against baseline autoregressive and standard diffusion models.

### LinkedIn Job Posts Tracking

- Built an ETL pipeline that scrapes LinkedIn job posts into a MySQL database on an EC2 instance.
- Designed a S.T.A.R schema database to store over **1000** job postings using MySQL and Python.
- Extracted job details and requirements using regular expressions and Named Entity Recognition (NER).
- Delivered personalized job recommendations by aligning users' resumes with job postings.

## Awards and Services

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### Finalist for Best Paper Award

AAAI Fall Symposium Artificial Intelligence for Human-Robot Interaction (AI-HRI), 2023

**Journal/Conference Reviewer:** ICRA, IEEE RA-L, AAAI AI-HRI, American Control Conference.

## Technical Skills

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**Programming Languages:** Python, C++ , Java, JavaScript, SQL

**AI/ML Specializations:** Reinforcement Learning, Diffusion Models, Energy-Based Models, Computer Vision, Optimization, Planning

**AI/ML Frameworks:** PyTorch, TensorFlow, Scikit-Learn, LangChain, Google Cloud Vertex AI

**Robotics Tools:** ROS/ROS2, NVIDIA Isaac Sim/Lab, MuJoCo, Gazebo

**Cloud & Databases:** AWS (S3, EC2), Google Cloud Platform, MySQL, SQL Server

**Development Tools:** Git, Linux, macOS, Windows