HOANG-DUNG BUI

+1 7753577521 ⋄ hbui20@gmu.edu ⋄ https://buivn.github.io ⋄ linkedin.com/in/hoangdungbui

PROFESSIONAL SUMMARY

- Roboticist and AI researcher with 5+ years experience in decoupled AI multi-robot motion planning under constraints: robot's dynamics and kinematics, communication or uncertainty.
- Expert in model-based decision-making frameworks and trajectory generation.
- Skilled in designing and deploying reliable real-time software infrastructure for autonomous robots, with strong expertise in C++, Python, and ROS.

EDUCATION

Ph.D. Candidate in Computer Science (robotics & AI) Jan. 2021 - May 2026
George Mason University, Fairfax, VA — **GPA** : 3.88
Dissertation: Scalable Motion Planning and Decision-Making for Heterogeneous Robot Teams under Uncertainty.

M.S. in Computer Science Jan. 2019–Dec. 2020
University of Nevada, Reno — **GPA** : 3.4

M.S. in Mechatronics Oct. 2011–Apr. 2014
University of Siegen, Germany, — **GPA**: 3.4

Bachelor of Science in Mechanical Engineering Sep. 2002–Jun. 2007
Hanoi University of Science and Technology, Vietnam — **GPA**: 7.17/10

PROFESSIONAL EXPERIENCE

Graduate Research Assistant — George Mason University, Fairfax, VA Jan. 2021–Present
My work is developing novel motion planning/decision-making frameworks for single/multiple robots under uncertainty, including:

- **Developed scalable multi-robot motion planning algorithms with robot dynamics** enabling robust navigation in unknown, obstacle-dense environments with up to 7 robots, while baselines fail with four robots.
- **Pioneered multi-agent pathfinding algorithms** under communication constraints using adaptive path expansion techniques, successfully scaling to **25 autonomous agents** compared to state-of-the-art baselines failing at 6 agents.
- **Created learning-informed motion planning systems** integrating machine learning with classical planners, achieving **30% reduction in travel distance** through intelligent decision-making algorithms and runtime predictions.
- **Developed scout-assisted planning** framework integrating **information gain formulation** and a GNN-based model to guide scouting drones' behavior on a huge action space. The travel cost of the ground robot team (up to 3 members) is improved from 30% to 45% in three tested environments with runtime in few seconds.
- **Developed a learning-guided motion planning** for robots with dynamics in complex environments to significantly improve planning runtime up to three folds.

DSHI-Servers Admin — George Mason University, Fairfax, VA August. 2025–present
My work is to install, setup, and maintaining DSHI-servers with security profile (HPIAA) and strict firewalls, including:

- Installing and setting up secure servers with HPIAA rules.

- Maintaining more than 20 servers that manages 3TB public health data.
- Maintaining hundred of users with different access levels.

Graduate Teaching Assistant - Computer Science Department — George Mason University, Fairfax, VA Jan. 2021–May, 2025

- Lab Instructor of CS522
- Teaching Assistant of CS 531 and CS222

Graduate Research Assistant — University of Nevada-Reno, Reno, NV Jan. 2019–Dec. 2020
My work was to develop control framework for complex structure robots with multiple sensors to apply real-world applications, including:

- **Designed a dual-mode autonomous control system for an Inchworm Hybrid Robot** for steel bridge inspection.
- **Developed an autonomous control framework for AUBO robotic arm manipulation** integrating vision-based object detection, grasping pose estimation, and trajectory planning.
- Implemented robust motion planning and device management for robotic manipulators in real-time environments.

Graduate Teaching Assistant — University of Nevada-Reno, Reno, NV Jan. 2019–Dec. 2020

- Lab Instructor CPE211

Teaching Professor — Thai Nguyen University of Technology, Thai Nguyen, Vietnam

- Teaching Metrology and Manufacturing Processes for Mechanical Faculty Aug. 2007–Sep. 2011.
- Teaching Manufacturing Process, Engineering Material, Manufacturing Automation (English instruction) for International Training Faculty Jun. 2014–Dec. 2018
- Advising for Bachelor's Thesis:
  - Trinh Van Truong

Reviewer for IROS, ICRA, and IEEE RAL 2020–Present
Task: Expert review of cutting edge research in robotics, AI agents, and autonomous systems.

AGENTIC AI RESEARCH IMPACT

- **Scalable Agent Coordination**: Demonstrated significant improvement in multi-agent system under team-connected communication constraints scalability (25 vs 6 agents)
- **Scalable Decision-Making for Scout-Assisted Planning**:

CORE TECHNICAL SKILLS

Agentic AI & Multi-Agent Systems

- Decoupled AI Planning Algorithms • Autonomous Decision-Making Frameworks • Partially Observable Multi-Agent System (Dec-POMDP) • Model-based Planning

AI/ML Technologies

- TensorFlow • PyTorch • CNN • GNN • Reinforcement Learning (PPO) • Foundation Models for Robotics • Learning-Informed Planning

Robotics & Control Systems

- Robot Dynamics • Motion Planning • Real-Time Operating Systems (FreeRTOS)

Github: https://github.com/buivn

SELECTED PUBLICATIONS

- H.D. Bui, E. Plaku, G. Stein - *Multi-agent Pathfinding under Team-Connected Communication Constraint via Adaptive Path Expansion and Dynamic Leading* - JAIR2025 (link).
- H.D. Bui, E. Plaku, G. Stein - *Multi-Robot Guided Sampling-Based Motion Planning with Dynamics in Partially Mapped Environments* - IEEE-Access 2024 (link)
- H.D. Bui, Y. Lu, E. Plaku - *Improving the Efficiency of Sampling-based Motion Planners via Runtime Predictions for Motion-Planning Problems with Dynamics* - IROS2022 (link)
- *Learning-informed Long-Horizon Navigation under Uncertainty for Vehicles with Dynamics* - A. Khanal, H.D. Bui, E. Plaku and G. Stein, IROS2024 (link)

Google Scholar: https://bit.ly/bui_googlescholar

AWARDS AND RECOGNITION

- Full Master Scholarship from Vietnam Ministry of Education and Training (2010)
- DAAD Scholarship - Germany (2010)
- Outstanding Academic Achievement Awards (2026)