NGUYEN MANH CUONG

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Homepage ◇ Google Scholar ◇ Github

EDUCATION

Hanoi University of Science and Technology (HUST) *Oct 2020 - May 2022*
M.S. in Control Engineering and Automation Very Good Grade
Excellent Grade Thesis

Hanoi University of Science and Technology (HUST) *Aug 2015 - Aug 2020*
The Degree of Engineer in Control Engineering and Automation Very Good Grade
Best Graduate Thesis Award

FIELD OF INTEREST

Humanoid Robots, Model Predictive Control, Whole-body Control, Reinforcement Learning, Industrial Robots, Autonomous Robot Systems.

WORKING EXPERIENCE

Head of Motion Control Department *09/2025 - Present*
Humanoid Robots VinRobotics

Key Responsibilities: Leading the development of full-stack control systems for humanoid robots (Locomotion, Manipulation, and Humanoid Hands), architecting the integration of control platform into reliable, production-grade systems:

Leadership and Strategy

· Manage, mentor, and grow a department of 10+ robotics engineers and researchers, driving team performance and technical excellence

· Define the strategic technical roadmap for the Motion Control department, balancing short-term product delivery with long-term R&D goals

· Spearhead cross-functional collaboration with hardware, perception, and AI teams to ensure seamless integration of control software

Humanoid Locomotion

· Design of real-time, model-based control architectures incorporating Model Predictive Control (MPC), Whole-Body Control (WBC), and force-sensorless state estimation for highly dynamic locomotion tasks

· Development of hybrid control frameworks that integrate model-based reference generators as structured priors to guide Reinforcement Learning

· Deployment of advanced RL policies to scale robust bipedal locomotion across multiple humanoid platforms with distinct kinematic and actuation configurations, supporting applications ranging from precision industrial tasks to high-speed dynamic behaviors

Humanoid Manipulation

· Implementation of advanced system identification and kinematic calibration methodologies to optimize baseline accuracy

· Design of real-time, high-precision, and compliant control frameworks dedicated to handling intricate industrial manipulation tasks

· Development of robust trajectory planning algorithms equipped with obstacle avoidance to enforce strict operational safety

Humanoid Hands

· Development of dexterous grasping and in-hand manipulation frameworks, integrating variable impedance control to achieve robust and versatile object handling

Key Achievements:

Humanoid Locomotion

· Achieved stable and dynamic walking at human-like speeds up to 1.6 m/s, significantly enhancing overall mobility and operational efficiency for real-world deployments

· Demonstrated centimeter-level goal-reaching precision and accurate spatial positioning, guaranteeing reliability for intricate automated workflows

· Developed extreme motion capabilities (bending, squatting, waist rotation) to overcome spatial limitations in tightly constrained environments, enabling the robot to reliably lift payloads up to 15kg from the ground [Link]

· Achieved high-speed running (up to 6m/s) and dynamic performing capabilities (dancing) [Link]

· Ensured highly reliable locomotion against uncertain dynamics, uneven terrain environments, and external pushing disturbances

· Successfully transferred generalized RL policies across diverse humanoid platforms, drastically reducing sim-to-real deployment time despite varying kinematic and actuation setups

· Conducted successful global demonstrations across Europe and Taiwan, featuring official public debuts at ICRA 2026 (Austria) and Computex 2026 (Taiwan) [Link]

Humanoid Manipulation

· Attained precision in industrial manipulation tasks with a verified 1-mm repeatability

· Demonstrated robust, collision-free operations in dynamic environments by deploying real-time, obstacle-aware trajectory planning algorithms

Humanoid Hands

· Achieved highly adaptive and versatile object handling capabilities by successfully integrating grasping control frameworks with variable impedance control

Senior Research Scientist *Jun 2025 - Present*

Intelligent Robotics System VinUniversity

· Contribute to the implementation and management of research projects in robotics and autonomous systems, with a strong focus on industrial applications, technology transfer, and translational research outcomes

· Facilitate academic and industry collaborations to strengthen the research ecosystem and expand international networks

· Conduct research and author high-impact scientific publications

· Co-supervise undergraduate and graduate students

Visiting Lecturer *Jan 2026 - Present*

Visiting Lecturer Vietnam National University, Hanoi

· Conduct active research in the field of AI and robotics, collaborating on innovative projects and academic publications

· Mentor and advise students on research projects focused on the intersection of AI and robotics

· Guide students through algorithm development, practical implementation, and academic research in AI-driven robotic systems

Senior Robotics Engineer *Oct 2024 - July 2025*
Autonomous industrial forklifts for container loading and unloading Goldbell Group, Singapore

Key Responsibilities:

· Led a cross-functional squad as Module Owner for Pallet Docking and Multiple Pallet Detection, overseeing the full lifecycle from architectural design to deployment

· Mentored junior engineers and spearheaded technical design reviews to ensure code quality and system robustness

· Directed the development of the forklift's motion planning and control architecture

· Designed and integrated Mission Control and Task Management features for the Autonomous Forklift System

Key Achievements:

· Achieved millimeter-level high accuracy for automated pallet docking operations

· Successfully delivered and deployed autonomous forklifts to multiple customers' sites across Singapore

Robotics Engineer *Oct 2022 - Oct 2024*
Autonomous industrial forklifts for smart warehouse application Goldbell Group, Singapore

Key Responsibilities:

· Served as Module Owner for Pallet Docking and Pallet Dropoff, specializing in complex operations within narrow racking areas

· Developed high-precision SLAM-based localization and navigation features

· Engineered the forklift's motion control and planning algorithms for autonomous navigation tasks

Key Achievements:

· Developed the core platform for motion planning and control, alongside the pallet docking module

· Delivered a comprehensive autonomy platform for complex industrial forklift tasks

Robotics Engineer *Dec 2020 - Oct 2022*
Auto Pilot (Autonomous Electrical Car) VinAI Research, Vingroup, Vietnam

Key Responsibilities and Achievements:

· Developed motion planning and control algorithms for autonomous parking and highway driving features

· Formulated vehicle modeling and implemented advanced control strategies

· Designed robust vehicle state estimation and localization pipelines

· Engineered automated vehicle smart mirror adjustment features

OTHER PROJECTS

Vietnam's National project - Research and develop an intelligent mobile robot using different types of sensing technology and IoT platform, AI, and implemented in radioactive environment monitoring application *Oct 2023 - 2025*
Vietnam Academy of Science and Technology

· Autonomous Navigation in the unknown radioactive environment

· Autonomous radioactive map building
· Planning and Control Module

Research, design, and manufacture an intelligent humanoid robot IVASTBot implemented in communication and serving people *Oct 2020 - Sep 2023*
Vietnam Academy of Science and Technology

· Designed and Implemented Model predictive control for mobile robots using ROS, applied into Navigation system
· Designed and Implemented the Navigation System

AREAS OF EXPERTISE

Leadership & Strategy	Cross-functional Team Leadership, Technical Roadmapping, Mentorship
Control Engineering	Model Predictive Control, Whole-Body Control, Nonlinear Control, Adaptive Control
Computer Science & AI	Reinforcement Learning, Motion Planning, SLAM, Object Tracking
Robotics & Simulation	Humanoid Locomotion, Manipulation, ROS/ROS2, MuJoCo, Gazebo
Programming Tools	C/C++, Python, MATLAB/Simulink, Linux, Docker, Git

REWARDS

Excellent Grade Thesis - Hanoi University of Science and Technology	*2022*
Postgraduate Scholarships - Vingroup Innovation Foundation (VinIF)	*2020 - 2021*
Merit-based Scholarship – (HUST)	*2020*
Best Graduation Thesis	*2020*