

TRAN VAN MANH

Robotics Engineer | Robot Simulation & Sim-to-Real | Autonomous Navigation & Deep Reinforcement Learning

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[LinkedIn](#) • [Google Scholar](#) • [GitHub](#) • [Portfolio](#)

PROFESSIONAL SUMMARY

Robotics Engineer with more than 5 years of experience across simulation-based robot development, autonomous navigation, and deep reinforcement learning. Experienced in building and configuring robot simulation environments (Gazebo, OpenAI Gym) to train and validate navigation policies, designing kinematic robot models, and tuning policies to close the sim-to-real gap before deploying them on physical robots.

TECHNICAL SKILLS

Core Expertise: Robot Simulation & Sim-to-Real Transfer, Autonomous Navigation, Mobile Robotics, Robot Modeling (URDF / SDF, Kinematics & Dynamics), Motion & Path Planning, Deep Reinforcement Learning (PPO, SAC), Probabilistic Robotics

Programming: C++, C, Python, MATLAB

Frameworks & Libraries: ROS / ROS2, Nav2, PyTorch, OpenAI Gym, OpenCV, RTAB-Map, NumPy, Matplotlib

Control: MPPI, MPC, PID, Backstepping, Sliding-Mode Control, Kalman Filter

Simulation & Tools: Gazebo, Stage, OpenAI Gym, MuJoCo, URDF / SDF, Git / GitHub, LaTeX

Embedded: STM32 (ARM)

PROFESSIONAL EXPERIENCE

Robotics Engineer — Robot Global Team (RGT)

Sep 2024 – Present

Local Planning & Behavior Trees for Service Robots Seoul, South Korea

- Developed and optimized local planners (TEB and MPPI) in Nav2 for autonomous navigation of service robots, reducing on-board computation cost on single-board computers (SBCs) by 30% to ensure real-time performance and stable control-loop timing.
- Implemented full autonomous navigation with Nav2 and designed behavior-tree decision-making with BehaviorTree.CPP for complex scenarios (e.g., narrow-path waiting logic).
- Supported the development of multi-floor navigation and docking features for service robots.
- Developed and maintained the motor controller (emergency-stop logic, robust serial communication, safety handling, battery-voltage filtering and logging); released production software deployed in restaurant environments.

Researcher — Intelligent Robot Laboratory, CBNU

Mar 2022 – Aug 2024

ATC Project: Deep-RL Collision-Avoidance Navigation Cheongju, South Korea

- Built simulation-based training pipelines and trained deep reinforcement learning collision-avoidance navigation policies (PPO, SAC) in simulation, then transferred them to real-world service robots to close the sim-to-real gap.
- Evaluated mapless navigation and localization with a motion-capture system, achieving a >95% navigation success rate and <10% localization error; performance certified under Korean (KR) safety standards.

Researcher — Vietnam-Korea Institute of Science & Technology (VKIST)

Aug 2020 – Feb 2022

KIST Sub-project — Industrial AMR Hanoi, Vietnam

- Researched and developed autonomous mobile robot (AMR) technology for industrial transport applications.
- Defined functions, requirements, specifications, and technical criteria, and designed the kinematic model and autonomous navigation framework for an omnidirectional mobile-robot prototype, including building the robot description model in URDF (converted from SolidWorks CAD).
- Designed and optimized magnetic flux density of a PMSM motor in JMAG; applied genetic-algorithm optimization, the ROS navigation stack, AMCL, and Kalman filtering.

Research Intern — Vietnam Academy of Science & Technology (VAST)

Mar 2018 – Aug 2020

Project: "Smart Human-Form IVASTBot Robot" (Phase 01) Hanoi, Vietnam

- Designed an intelligent trajectory-tracking system for an omnidirectional mobile robot.

- Developed backstepping and sliding-mode control algorithms in MATLAB and deployed low-level control in C on embedded systems.

EDUCATION

M.Sc. in Control and Robot Engineering

Mar 2022 – Aug 2024

Chungbuk National University (CBNU) Cheongju, South Korea

- GPA: 3.69 / 4.0 (4.19 / 4.5).
- **Thesis:** *Autonomous Navigation in Complex Environments Based on Deep Reinforcement Learning Using Selective Policy Switching for Mobile Robots.*

B.Eng. in Control Engineering and Automation

Aug 2015 – Aug 2020

Hanoi University of Science and Technology (HUST) Hanoi, Vietnam

- GPA: 3.12 / 4.0.
- Ranked 1st in Vietnam for Electrical and Electronic Engineering (QS World University Rankings).

PUBLICATIONS & PATENTS

Journal Articles

- **Tran, V. M.** and Kim, G.-W. (2024). "Cooperative Deep Reinforcement Learning Policies for Autonomous Navigation in Complex Environments." *IEEE Access*, vol. 12, pp. 101053–101065. **(First author)**
- **Tran, V. M.** and Kim, G.-W. (2024). "Mapless Navigation with Distributional Reinforcement Learning." *Journal of Korea Robotics Society*, vol. 19(1), pp. 92–97. **(First author — Best Paper Award)**
- Ha Thi, K. D., **Tran, V. M.**, et al. (2021). "Adaptive Control for Uncertain Model of Omnidirectional Mobile Robot Based on Radial Basis Function Neural Network." *International Journal of Control, Automation, and Systems*, vol. 19, pp. 1715–1727. (Co-author)
- Ha Thi, K. D., **Tran, V. M.**, et al. (2020). "Autonomous Navigation for Omnidirectional Robot Based on Deep Reinforcement Learning." *International Journal of Mechanical Engineering and Robotics Research*. (Co-author)

Conference Papers

- Quang, H. D., **Tran, V. M.**, et al. (2019). "Mapping and Navigation with a Four-Wheeled Omnidirectional Mobile Robot Based on the Robot Operating System." *MoRSE*, Bali, Indonesia, pp. 54–59. (Co-author)
- Ha Thi, K. D., **Tran, V. M.**, et al. (2019). "Trajectory Tracking Control for a Four-Wheeled Omnidirectional Mobile Robot Using Backstepping Aggregated with Sliding Mode Control." *ICA-SYMP*. (Co-author)
- Nguyen, T. L., **Tran, V. M.**, et al. (2019). "Nonlinear Backstepping-Sliding Mode Control of Electro-Hydraulic Systems." *ICERA*, Springer. (Co-author)
- Nguyen, M. C., **Tran, V. M.**, et al. (2019). "Neural-Network-Based Adaptive Control of Web Transport Systems." *ICSSE*, pp. 124–128. (Co-author)

Patents

- **Tran, V. M.** and Kim, G.-W. (2024). "Autonomous Navigation System in Complex Environments Based on Deep Reinforcement Learning Using Selective Policy Switching for a Mobile Robot." KR Patent MP24-0134 / MP24-0141.

HONORS & AWARDS

- Best Paper Award, Journal of Korea Robotics Society (2024).
- Korean (KR) Safety Certification for human-robot navigation performance (2024).
- Graduate Scholarship for four semesters of the M.Sc. program, Chungbuk National University (2022–2024).
- Best Graduation Thesis Defense, Hanoi University of Science and Technology (2020).

LANGUAGES

Vietnamese (Native) • English (TOEIC 740 / IELTS 6.5)