Dinh Van Nam

Ha Noi, Viet Nam | +84-90 497 7294
quangnam.auto.tech@gmail.com
Personal site
github | linkedin

Summary - Slides

I am a lead robotics and control systems engineer at VinFAST/VinAI, focusing on smart mobility technologies such as control systems, motion planning, optimization, and multi-sensor SLAM using LiDAR, cameras, and inertial sensors.

Previously, I worked as a Brain Korea Postdoctoral Researcher and Robot Engineer in South Korea. I was part of the Clothoid team, which placed 5th in the Hyundai Self-Driving Challenge in 2019. I have led and contributed to numerous robotics and autonomous vehicle projects, specializing in perception and control systems for AVs, robotic arms, UAVs, and multi-robot systems.

My research interests include robotic AI, SLAM, state estimation, optimization, learning-based control, and advanced control systems.

Research Interests

Robot Navigation Systems

- Multi-sensor fusion: LiDAR, camera, radar, IMU
- Visual SLAM and Visual-Inertial Navigation (VINS)
- Real-time robotics and optimization techniques
- Multi-robot collaboration: motion planning and SLAM

Planning and Control Systems

- Fast and robust motion/path planning
- Factor-graph-based optimal control, nonlinear MPC

AI Robotics

- Optimal control and AI for humanoid robots
- Machine learning for intelligent robotic systems

Education

Chungbuk National University *2018.09–2022.02*

Ph.D. in Control and Robot Engineering

- Minored in Control and Robot Engineering
- *Thesis: Robust Multi-Sensor Fusion-Based SLAM using State Estimation by Learning Observation Models*

Le Quy Don Technical University *2014.03–2016.03*

M.S. in Cybernetics and Automation Engineering

- Minored in Cybernetics and Automation Engineering

Hanoi University of Science and Technology (HUST) *2007.09–2012.08*

B.E. in Electrical Engineering

- Minored in Automation and Control Engineering

Experience

Senior ADAS and Robotics Engineer, VinFAST *2025.04–Present / Vietnam*

Leading development of motion planning, optimal control, and visual-based SLAM systems for smart mobility platforms.

Lead Robotics and Control Engineer, VinAI *2022.12–Present / Vietnam*

Responsible for designing and implementing motion planning and SLAM algorithms with real-time performance for autonomous s

Brain Korea Postdoctoral Researcher, Chungbuk National University *2022.06–2022.12 / South Korea*

Researched AI-driven control and SLAM systems for agricultural robotics.

Focused on agriculture robotics, SLAM, AI-based robotics, and optimal control.

Researcher, Intelligent Robotics Lab (IRL), Chungbuk National University *2018–2022 / South Korea*

Worked on SLAM, robotics AI, optimization, and learning control.

Lecturer, Vinh University *2013–2018 / Viet Nam*

Taught control systems and automation in the Control and Automation Department.

Working Student, Viet Nam Automation Company Ltd. *2011–2012 / Viet Nam*

Contributed to research and software development for smart home devices.

Skills

Programming Languages	**Experienced:** C/C++, MATLAB/Simulink, Python
Software Development Tools	Visual Studio Code, CLion, Git, Keil MDK, MATLAB, LABVIEW
AI Frameworks and Libraries	PyTorch, Jupyter, scikit-learn, MATLAB-GPU
Robot Programming	ROS, OpenCV, GTSAM, Ceres Solver, Eigen
Languages	**Native:** Vietnamese, **Fluent:** English

Tutorials with Code

- 3D Scalable Robotcar-Autonomy: Scalable-Car-Robot
- Model prediction control and optimal control: Casadi-MPC; Geo-MPC Path Tracking
- Mixed-Integer Quadratic Programming (MIQP) MIQP-MPC
- 3D Point-Line Extrinsic Camera Calibration: Calibration
- 3D Computer Vision with Ceres Solver: computer vision-C++
- Open3D Tutorials in C++: open3D-C++
- Gurobi Optimizer in C++: GitHub
- AlexNet on Cudnn-GPU using ROS C++: GitHub
- Visual SLAM Tutorial in C++: GitHub

Patents

ID: 10-2020-0188129: Dinh Van Nam, Automatic Calibration System for Multiple LiDARs using Robust Adaptive Covariance and Line Segment Features, 2021

Selected Publications

- Full publications

Van Nam Dinh and Gon-Woo Kim, 'Online Self-Calibration of Multiple 2D LiDARs Using Line Features With Fuzzy Adaptive Covariance," in *IEEE Sensors Journal* vol. 21, no. 12, pp. 13714-13726, 15 June, 2021, doi: 10.1109/JSEN.2021.3053260.

Van Nam Dinh and Gon-Woo Kim, 'Learning Observation Model for Factor Graph Based-State Estimation Using Intrinsic Sensors," in *IEEE Transactions on Automation Science and Engineering*, 2022, doi: 10.1109/TASE.2022.3193411.

Van Nam Dinh and Gon-Woo Kim, 'Learning Observation Models for Factor Graph Based-Robust State Estimation," in *IEEE Transactions on Intelligent Transportation Systems*, 2023, doi:10.1109/TITS.2023.3234595

Van Nam Dinh et al., 'Fusion consistency for industrial robot navigation: An integrated SLAM framework with multiple 2D LiDAR-visual-inertial sensors," in *Computers and Electrical Engineering*, 120 (2024): 109607.

Selected Projects

- 3D Autonomy Navigation and Exploration toward Uneven Terrains: Developing an Affordable and Scalable Autonomous Car-like Robot (from 2024) - responsibilities: lead the research on the development of a cost-effective and scalable autonomous car-like robot: Solution Architecture, Design and Implementation of Visual-inertial-LiDAR SLAM, Development of Fast Exploration Motion Planning, High-accuracy 3D Localization and Mapping, Advanced Perception and Control. Smart mobility (from 2023)- auto parking and memorized parking using only an SVM camera: I developed expertise in appropriate control and visual-SLAM tasks and effectively fused sensor data to achieve accurate and reliable state estimation, motion planning, and control system. The fast motion planning and optimal control system was developed and verified on C++ code without any third-party library to integrate into a Linux-based system. I developed a tight-coupled visual-inertial-wheel SLAM system using only camera-IMU and wheel odometers for the memorized parking system.

- Urban 3D reconstruction and monitoring system using swarm UAV decentralization (from 2024)- responsibilities: lead the research on the 3D reconstruction and monitoring system using multi-UAV decentralization: Solution Architecture, Develop the Visual-inertial-LiDAR SLAM, Develop a fast explorations motion planning, 3D reconstruction using 3D LiDAR-camera, Intelligent air perception.
- Robot navigation system for agriculture robot (from 2022): I developed a low-cost navigation system using only the Ublox GPS, 6-DoF IMU, and a monocular camera for the intelligent agriculture robot in challenging environments. The core of the system is implemented based on the adaptive Kalman filter with very high accuracy. I developed the whole system in C++ and deployed it on the NXP i.MX6 processor-based- Linux system without any external library.

- A multiple Visual-LiDAR-Inertial SLAM system for mobile industrial robots (from 2021): We propose a low-cost SLAM architecture based on a LiDAR-centric technique with the hybrid couple strategy that utilizes multiple LiDAR, a multi-stereo camera, and an IMU. The suggested system can operate effectively at high speeds and outperform previous LiDAR and visual SLAM systems.

- A low-cost omnidirectional visual-inertial SLAM for indoor and outdoor mobile robots (from 2021): Recently, the 360 cameras can work well both indoors and outdoors with many visual features. We aim to develop a visual-inertial SLAM system using an omnidirectional camera and a low-cost IMU. This system can provide a similar accuracy as LiDAR SLAM, but the price is less than 20 times.

- All-round driving 7 Ton AGV (Korean government-2018-2021): A Korean government-funded research project involving Han Sung Well-Tech Co, Ltd and Power AGV companies. This project aims to develop and evaluate the autonomous AGV platform capable of long-range indoor/outdoor localization and navigation with a 7-ton payload. My task is to provide SLAM capability using multiple LiDARs, multi-stereo vision and IMU sensors, and I also manage the navigation system task for this project.

- Multi-LiDAR Calibration for UGV (from 2020): An automatic calibration framework for multiple LiDARs on manifolds is proposed by adopting the line features-based optimization algorithm with fuzzy inference system-aware robust adaptive covariance.

- A Visual Inertial Navigation System (VINS) for MAV (from 2020): An efficient and lightweight VINS algorithm is developed for the robust state estimation of a mobile robot by practicing a stereo camera and an IMU towards dynamic indoor environments.

- Smart Car Project (Korean government 2014-2020): I joined the project in 2018. A Korean government-funded Autonomous vehicle project involving diverse research domains. I researched and simulated the low- and high-level control system framework. I developed the MPC controller for lateral, longitudinal control, and deep learning-based steering control.

- Hyundai Autonomous Vehicle Competition 2019: Competed in an autonomous vehicle competition by developing a completely autonomous vehicle system. My task was to develop a navigation system, focusing on motion planning, path generation, control system, and vehicle state management.