

# Hoang Viet Do, Ph.D.

Postdoctoral Researcher

intelligent Navigation and Control Systems Lab

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## Education

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2025	<b>Ph.D. in Intelligent Mechatronics Engineering</b> (GPA: 4.5/4.5)
(Dual Degree)	<b>Ph.D. in Convergence Engineering for Intelligent Drone</b> (BK21 FOUR) <b>Sejong University, Seoul, Republic of Korea</b> <ul style="list-style-type: none"><li>• Dissertation: <i>Dead Reckoning Based on Radar Odometry: Approaches, Design, and Experiments</i> [PDF]</li><li>• Advisor: Associate Professor Jin Woo Song</li></ul>
2021	<b>M.Eng. in Unmanned Vehicle Engineering</b> (GPA: 4.38/4.5)
(Dual Degree)	<b>M.Eng. in Convergence Engineering for Intelligent Drone</b> (BK21 FOUR) <b>Sejong University, Seoul, Republic of Korea</b> <ul style="list-style-type: none"><li>• Thesis: <i>A Monocular Visual-Inertial Navigation System based on Multi-state Constraint Kalman Filter with Comprehensive Feature Motion Measurements</i> [PDF]</li><li>• Advisor: Associate Professor Jin Woo Song</li></ul>
2018	<b>B.S. in Control Engineering and Automation Technology</b> <b>Hanoi University of Science and Technology, Hanoi, Vietnam</b> <ul style="list-style-type: none"><li>• Thesis: <i>Applying Convolutional Neural Networks for road lane detection, Adaboost for traffic light recognition and PID for trajectory tracking for an autonomous car</i> (in Vietnamese)</li><li>• Advisor: Thu Ha Nguyen, Ph.D., and Thi Lan Le, Associate Professor</li></ul>

## Awards and Scholarship

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2021	Brain Korea 21 Phase Four (BK21 FOUR) Scholarship
2018	Best Final Year Project (B.S. Thesis).
2017	Hanoi University of Science and Technology Award for Excellent Students

## Technical Skills and Interests

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<b>Research Interests:</b>	Artificial intelligence for robotics, Kalman filtering, SLAM, state estimation, sensor fusion (LiDAR, Radar, Camera, IMU, and GNSS)
<b>Programming:</b>	C++, ROS 1/2, Python, MATLAB, L <sup>A</sup> T <sub>E</sub> X
<b>Languages:</b>	Vietnamese (native), English (IELTS: 6.5 — L: 6.5, R: 7.0, W: 6.0, S: 6.0)

## Open-source Software

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|------|---|
| 2024 | Dead Reckoning Based on Radar Odometry (C++) – <i>IEEE IROS</i>                 |
| 2021 | Drone Visual-Inertial Navigation System Simulation (MATLAB) – <i>IEEE ICCAS</i> |

## Journals

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1. **Hoang Viet Do**, Bo Sung Ko, Yong Hun Kim, and Jin Woo Song, “CREVE: An Acceleration-based Constraint Approach for Robust Radar Ego-Velocity Estimation,” Submitted to *IEEE Sensor Journal*, 2025 [**Arxiv**]
2. Bo Sung Ko, Joo Han Lee, **Hoang Viet Do**, Yong Hun Kim, and Jin Woo Song, “INS/Multi-Positioning Sensor-Based Fault Tolerant VTOL Navigation System Via 3D Distance Constraints,” *IEEE Transactions on Aerospace and Electronic Systems*, 2025 [**Paper**]
3. **Hoang Viet Do** and Jin Woo Song, “Error-state Kalman Filtering with Linearized State Constraints,” *Aerospace* 2025, 12, 243 [**Paper**]
4. Min Ho Lee, Kyeong Wook Seo, Dong Yun Hwang, Jin Woo Song, and **Hoang Viet Do**, “Radar Dead-reckoning Based EKF-SLAM Using Virtual Line Segment,” *Journal of Institute of Control, Robotics and Systems*, vol. 30, no. 9, pp. 996-1003, 2024
5. Kyeong Wook Seo, Dong Yun Hwang, Min Ho Lee, Jin Woo Song, and **Hoang Viet Do**, “Re-estimate the Robot Position by Estimating the Location of Unknown ArUco Markers with Feature Velocity Aid,” *The Transactions of the Korean Institute of Electrical Engineers*, vol. 73, no. 4, pp. 711-717, 2024
6. Duyen Ha Thi Kim, Tien Ngo Manh, Chien Nguyen Nhu, **Viet Do Hoang**, Huong Nguyen Thi Thu, “Tracking control for electro-optical system in vibration enviroment based on self-tuning fuzzy sliding mode control,” *Journal of Computer Science and Cybernetics*, vol. 35, no. 2, pp. 185-196, 2019 [**Paper**]

## Conferences

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1. **Hoang Viet Do**, Yong Hun Kim, Joo Han Lee, Min Ho Lee, and Jin Woo Song, “DeRO: Dead Reckoning Based on Radar Odometry With Accelerometers Aided for Robot Localization,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2024 [**Code**][**Paper**][**ArXiv**]
2. **Hoang Viet Do**, Yeong Seo Kwon, Hak Ju Kim, and Jin Woo Song, “An Improvement of 3D DR/INS/GNSS Integrated System using Inequality Constrained EKF,” *22nd International Conference on Control, Automation and Systems (ICCAS)*, 2022 [**Paper**]
3. **Hoang Viet Do**, Yong Hun Kim, Yeong Seo Kwon, San Hee Kang, Hak Ju Kim, and Jin Woo Song, “An Adaptive Approach based on Multi-State Constraint Kalman Filter for UAVs,” *21st International Conference on Control, Automation and Systems (ICCAS)*, 2021 [**Code**][**Paper**]
4. Yeong Seo Kwon, Yong Hun Kim, **Hoang Viet Do**, San Hee Kang, Hak Ju Kim, and Jin Woo Song, “Radar Velocity Measurements Aided Navigation System for UAVs,” *21st International Conference on Control, Automation and Systems (ICCAS)*, 2021 [**Paper**]
5. Hoang Anh Tran, **Hoang Viet Do**, and Jin Woo Song, “State Estimation for Polysolenoid Linear Motor based on an Adaptive Unscented Kalman Filter with Unknown Load and Measurement Noises,” *20th International Conference on Control, Automation and Systems (ICCAS)*, 2020 [**Paper**]
6. Min Jun Choi, Yong Hun Kim, Eung Ju Kim, **Hoang Viet Do**, and Jin Woo Song, “Land-Vehicle Navigation System for Autonomous Driving with Averaged Nonholonomic Measurement,” *IEEE Vehicle Power and Propulsion Conference (VPPC)*, 2019 [**Paper**]

## Research Experience

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- 2025 – present     **Development of magnetometer calibration algorithm and attitude heading reference system (AHRS) algorithm**  
*Postdoctoral Researcher at iNCSL, Sejong University*
- Funded by Haechitech Company
  - Smartphone application
- 2024 – 2025     **Development of 3D Sensor Fusion Technology for Improving Detection Performance of Unmanned Vehicles**  
*Graduate Research Student at Sejong University*
- Funded by the National Research Foundation of Korea (NRF)
  - Building a ROS 2 package to gather sensor data from a LiDAR (Livox Avia), a radar (RETINA-4FN), and a camera (OAK-D Pro)
- 2022 – 2023     **Development of Indoor and Outdoor Integrated Navigation Technology for Operating in Unknown and Harsh Environments**  
*Graduate Research Student at Sejong University*
- Funded by the National Research Foundation of Korea (NRF)
  - Collaborating with Seoul National University
  - Building a simulation for ground and aerial vehicles using Unreal Engine and AirSim to generate LiDAR, IMU, and camera data in harsh environments (rain, snow, fog, and tunnels) [Code]
- 2019 – 2021     **Development of Core Technology for Next Generation AI-based Unmanned Flying Vehicles**  
*Graduate Research Student at Sejong University*
- Funded by the Ministry of Science and ICT, Republic of Korea
  - Outdoor and indoor autonomous landing of a drone on static and moving targets using an IMU and camera
  - Simulation (Gazebo, ROS 1, Python) [Code] and real-world experiments (CUAV v5+, Raspberry Pi 4 and Intel Realsense T265)
- 2016 – 2017     **Research and Development of Control Algorithms for Electro-Optical Tracking and Omnidirectional Robotics**  
*Undergraduate Research Student at Vietnam Academic of Science and Technology (VAST)*
- One domestic conference paper.