Sunghoon Hong

Department of Electronic and Electrical Engineering (PhD student)

▸ Incheon, Republic of Korea

▸ korean

▸ married

SKILLS

Software development   9+ yrs.

UAV 3-D SLAM (Simultaneous Localization And Mapping) using RGB-D and IMU sensors   2+ yrs.

FCWS (Forward Collision Warning System) using a single camera   2+ yrs.

Android app development for in-vehicle ADAS device installation   2+ yrs.

MCU (Micro Controller Unit) development for display and vehicle control   2+ yrs.

Precision position control using single camera and magnetic sensor for autonomous mobile robot   2+ yrs.

Marker-based docking using a single camera for autonomous mobile robot   2+ yrs.

Biography

Sunghoon Hong (Ph.D. Student) received the M.S. degree in Intelligent Robot Engineering from the Hanyang University, Seoul, Korea, in 2016. His main interest is Human-Like Autonomous Driving Systems. He has a lot of experience in autonomous driving technologies such as Simultaneous Localization And Mapping (SLAM), Advanced Driver Assistance Systems (ADAS), Proportional-Integral-Differential (PID) control, machine learning, path-planning and navigation algorithms and has published several journal/conference papers. He is currently pursuing toward obtaining his Ph.D. degree in the Department of Electronic and Electrical Engineering, Kyungpook National University, Daegu, Korea from 2021. He is researching technologies to optimize deep learning-based object detection algorithms for human-like artificial intelligence autonomous driving systems to be applied to low-power embedded systems.

Work experience

Principal Research Engineer   **08/2023 - today**
SW1
Syscon Robotics (155-30, Robot land-ro, Seo-gu, Incheon, Republic of Korea)

Autonomous Mobile Robots (AMR) Development

PhD Student   **09/2021 - today**
Department of Electronic and Electrical Engineering
Kyungpook National University

Deep learning-based object detection algorithms optimization for human-like artificial intelligence autonomous driving systems to be applied to low-power embedded systems.

Part-time Instructor   **03/2022 - 02/2023**
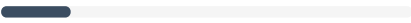Department of Electronic Engineering
Kyungpook National University

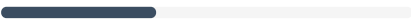1. Microprocessor, 2. Electronic circuit Experiment

Publications

0.1 Journal Publications (KCI 2, SCI 1)

- Author, S Hong. & Author, D Park. (2021). "Vision-based Real-time Vehicle Detection and Tracking Algorithm for Forward Collision Warning". In: *Journal of the Korea Institute of Information and Communication Engineering*, July 31, 2021.

- Author, S Hong. & Author, D Park. (2022). "Lane Detection Based on Inverse Perspective Transformation and Machine Learning in Lightweight Embedded System". In: *IEMEK Journal of Embedded Systems and Applications*, February 8, 2022.

- Author, S Hong. & Author, D Park. (2022). "Runtime ML-DL Hybrid Inference Platform Based on Multiplexing Adaptive Space-Time Resolution for Fast Car Incident Prevention in Low-Power Embedded Systems". In: *Sensors*, April 14, 2022.

- Author, S Hong. & Author, D Park. (2024). "Differential Image-based Scalable YOLOv7-Tiny Implementation for Clustered Embedded Systems". In: *IEEE Transactions on Intelligent Transportation Systems*, (Under Review).
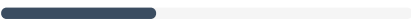
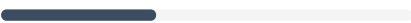**Path-planning and navigation for autonomous mobile robott** 2+ yrs.

SLAM (Simultaneous Localization And Mapping) using Lidar and RGB-D sensors for autonomous mobile robot 4+ yrs.
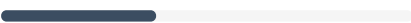
Deep learning-based object detection in low-power embedded systemst 4+ yrs.

Machine learning-based lane detection in low-power embedded systems 4+ yrs.

Continuous Differential Image-based Fast Convolution for Convolutional Neural Networks 4+ yrs.

- Author, S Hong. & Author, D Park. (2024). "Machine Learning-based Fast and Precise Rack Docking System for Autonomous Mobile Robots using 2D LiDAR". In: *IEEE Transactions on Robotics*, (On Writing).

- Author, S Hong. & Author, D Park. (2024). "On-Chip Realization of Efficient Lane Departure Warning Systems using Inverse Perspective Transformation and Machine Learning-based Lane Detection". In: *IEEE Transactions on Vehicular Technology*, (On Writing).

0.2 International Conference Publications (Intl. 4)

- Author, S Hong. & Author, D Park. (2021). "Lightweight Collaboration of Detecting and Tracking Algorithm in Low-Power Embedded Systems for Forward Collision Warning". In: *Twelfth International Conference on Ubiquitous and Future Networks (ICUFN)*, August 17-20, 2021.

- Author, S Hong. & Author, D Park. (2022). "Runtime Virtual Lane Prediction Based on Inverse Perspective Transformation and Machine Learning for Lane Departure Warning in Low-Power Embedded Systems". In: *IEEE International Conference on Imaging Systems and Techniques (IST)*, June 21-23, 2022.

- Author, S Hong. & Author, D Park. (2022). "Continuous Differential Image-based Fast Convolution for Convolutional Neural Networks". In: *13th International Conference on Information and Communication Technology Convergence (ICTC)*, October 19-21, 2022.

- Author, S Hong. & Author, D Park. (2023). "Differential Image-based Fast and Compatible Convolutional Layers for Multi-core Processors". In: *International Conference on Artificial Intelligence in Information and Communication (ICAIIC)*, February 20-23, 2023.

Lorem, 19th February 2024

Sunghoon Hong

Education

09/2021 - 08/2023

Department of Electronic and Electrical Engineering (PhD student)
Kyungpook National University, Daegu, Republic of Korea.

PhD's thesis: "Differential Image-based Scalable YOLOv7-Tiny Implementation for Clustered Embedded Systems", (On Writing).

03/2014 - 08/2016

Intelligent Robot Engineering (M.Sc.)
Hanyang University, Seoul, Republic of Korea.

Master's thesis: "UAV 3-D SLAM Using RGB-D and IMU Sensors".

03/2008 - 02/2014

Department of Electronic Engineering (B.Sc.)
Cheongju University, Chungcheongbuk-do, Republic of Korea.

03/2005 - 02/2008

Natural Sciencesl

Cheonggu High School, Daegu, Republic of Korea.

Interests

- SLAM
- ADAS
- Optimization techniques
- Human-Like Autonomous Driving Systems

Contact

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