CURRICULUM VITAE – JHONGHYUN AN

PERSONAL INFORMATION

Jhonghyun An
Gachen University
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Google Scholar

RESEARCH INTEREST

Intelligence vehicle system
Information fusion
Machine Learning
Deep Learning
Multi-Object Detection and Tracking
Laser scanner based Recognition technology

RESEARCH EXPERIENCES

Gachen University
Associate professor, Department of AI-Software
Mar. 2022 → Present

Agency for Defense Development(ADD)
Senior Researcher at Unmanned Ground System PMO Team 1
Jun. 2020 → Feb. 2022

Yonsei University
Research Assistant at Computational Intelligence Lab. Mar. 2013 → Feb. 2020

Team Leader of Autonomous Vehicle Competition
13th Hyundai Motor Group Autonomous Vehicle Competition
Oct. 2015 → May 2016

EDUCATION

Ph.D. in Yonsei University
Department of Electrical and Electronic Engineering (2013-2020).
Advisors: Euntai Kim
Thesis title: *Novel Moving Vehicle Detection and Vehicle Bounding Box Tracking Using a Low-end 3D Laser Scanner*
GPA: 3.96 / 4.5

B.S in Yonsei University
Department of Electrical and Electronic Engineering(2008-2012).
GPA: 3.36 / 4.5

INTERNATIONAL JOURNAL	Wonje Jang, Junhyuk Hyun, **Jhonghyun An**, Minho Cho and Euntai Kim, "A Lane-level Road Marking Map using a Monocular Camera," *IEEE/CAA Journal of Automatica Sinica*, vol. 9, no. 1, pp. 187-204, Jan. 2022(line: http://www.ieee-jas.net/article/id/cae86f29-ee3b-480f-b5fb-0e5f80075051?pageType=en
	Jhonghyun An,and Euntai Kim, "Novel Vehicle Bounding Box Tracking Using a Low-End 3D Laser Scanner," *IEEE Transactions on Intelligent Transportation Systems* (**TITS, IF:5.744**), vol. 22, no. 6, pp. 3403-3419, June. 2021.(link : https://ieeexplore.ieee.org/document/9098054)
	Jhonghyun An, Baehoon Choi, Hyunju Kim, and Euntai Kim, "A New Contour-Based Approach to Moving Object Detection and Tracking Using a Low-end 3-Dimensional Laser Scanner," *IEEE Transactions on Vehicular Technology* (**TVT, IF:5.339**), vol. 68, no. 8, pp. 7392-7405, Aug. 2019. (link : https://ieeexplore.ieee.org/document/8743409/, video : https://youtu.be/bX8dwg57LgM)
	Jhonghyun An, Baehoon Choi, Kwee-Bo Sim, and Euntai Kim, "Novel Intersection Type Recognition for Autonomous Vehicles Using A Multi-Layer Laser Scanner," *Sensors* (**IF:3.031**), vol. 16, no. 7, pp. 1123-1137, Jul. 2016. (link:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4970166/)
INTERNATIONAL CONFERENCE	Minho Cho, **Jhonghyun An**,Wonje Jang, and Euntai Kim, "Object Classification of Laser Scanner by Using Recurrent Neural Network," in *Proc. of the IEEE TENCON 2018*, Jeju, Korea, October, 2018.
	Wonje Jang, **Jhonghyun An**, Sangyun Lee, Minho Cho, Myungki Sun and Euntai Kim, "Road Lane Semantic Segmentation for High Definition Map," in *Proc. of the IEEE Intelligent Vehicle Symposium* (**IV 2018**), Changshu, China, June, 2018.
	Wonje Jang, **Jhonghyun An**, Minho Cho and Euntai Kim, "Real Time Road Lane Detection for Outdoor Autonomous Navigation of Mobile Robot," in *Proc. of the 17th International Conference on Control, Automation and Systems* (**ICCAS 2017**), Jeju, Korea, Oct, 2017.
	Minho Cho, **Jhonghyun An**, Wonje Jang and Euntai Kim, "Histogram-model based Road Boundary Estimation by using Laser Scanner", in *Proc. of the 2016 16th International Conference on Control, Automation and Systems* (**ICCAS 2016**) , Gyeongju, Korea, Oct. 2016
	Jhonghyun An, Baehoon Choi, Taehun Hwang and Euntai Kim, "A novel rear-end collision warning system using neural network ensemble," in *Proc. of IEEE Intelligent Vehicle Symposium* (**IV2016**), Gothenburg, Sweden, 2016.
	Jhonghyun An, Baehoon Choi and Euntai Kim, "Novel Intersection Recognition Approach for Advanced Driver Assistance System Using Multi-Layer Laser Scanner," in *Proc. of the 16th Intelligent Systems and 15th International Symposium on Advanced Intelligent Systems* (**ISIS 2015**), Mokpo, Korea, Nov, 2015.

Minho Cho, Baehoon Choi, **Jhonghyun An**, and Euntai Kim, "Road Boundary Estimation by using Laser Scanner," in *Proc. of 2015 International Conference on Fuzzy Theory and Its Applications* (**iFuzzy2015**) , Yilan, Taiwan, Nov, 2015.

Minho Cho, Baehoon Choi, **Jhonghyun An**, and Euntai Kim, "Vehicle detection and classification in the Scala sensor by using binary classification," in *Proc. of the 2015 15th International Conference on Control, Automation and Systems* (**ICCAS 2015**), Busan, Korea, Oct. 2015.

Jhonghyun An, Baehoon Choi, Beomseong Kim, Jaego Hwang, Euntai Kim, "Rear-end Collision Warning System Using Linear Discriminant Analysis," in *Proc. of Joint 7th International Conference on Soft Computing and Intelligent Systems and 15th International Symposium on Advanced Intelligent Systems* (**SCIS&ISIS 2014**), Kitakyushu, Japan, Dec, 2014.

Baehoon Choi, **Jhonghyun An**, Beomseong Kim and Euntai Kim, "Intervehicular Sensor Fusion for Situation Awareness," in *Proc. of The 3rd IFAC Symposium on Telematics Applications* (**TA 2013**) , seoul, Korea, Nov, 2013. pp.79-82

DOMESTIC JOURNAL	최배훈, **안종현**, 조민호, 김은태, "MCMC기반 파티클 필터를 이용한 지능형 자동차의 다수 전방 차량 추적 시스템," 한국지능시스템학회 논문지, vol. 25, no. 2, pp.186-190, 2015년 4월.

김범성, 최배훈, **안종현**, 황재호, 김은태 "신경회로망을 이용한 새로운 충돌 경고 시스템", 한국지능시스템학회 논문지, vol. 24, no. 4, , pp.392-397,2014년 8월

김범성, 최배훈, **안종현**, 이희진, 김은태 "퍼지 논리와 Interacting Multiple Model (IMM)을 통한 잡음환경에서의 맞은편 차량의 중앙선 침범 예측", 한국지능시스템학회 논문지, vol.23, no.5, pp.444-450, 2013년 10월.

DOMESTIC CONFERENCE	16 papers on various topics in Korean

AWARDS	**Outstanding Research Award**, 2020 The 35th Institute of Control, Robotics and Systems Annual Conference (ICROS 2020)

INVITED TALKS	Moving Object Detection and Tracking using Low-end Laser Scanner, Keimyung University, 2020

Moving Vehicle Detection and Vehicle Bounding Box Tracking Using a Low-end 3D Laser Scanner, Institute of Control, Robotics and Systems Annual Conference, 2020

Research
Experiences

- **Development of Object Detection Algorithm for 3D Lidar Sensor Data**
  - Developed an algorithm for Low-end 3D LiDAR Sensor
  - Jun.2019 - Apr.2020
  - Funded by Hyundai Mobis

- **Development of Road Model Generation Algorithm Based on Multi-Vehicle Data**
  - Developed a System of Lane Extraction and SLAM Algorithm using Multi MMS Vehicle
  - Mar.2018 - May.2019
  - Funded by Hyundai MNSorft

- **Development of Scala-based Object Recognition Algorithm**
  - Developed an Algorithm for Scala-based Object Recognition
  - Dec.2017 - Jun.2018
  - Funded by Hyundai Motor Group

- **Development of Lane Extraction Algorithm for Machine Learning Based Mobile Mapping System (MMS) Image**
  - Developed an System of Lane Extraction Algorithm using MMS
  - Jun.2017 - Jun.2018
  - Funded by Hyundai MNSorft

- **13th Hyundai Motor Group Future Motor Technology Autonomous Vehicle Competition**
  - Developed an System of Autonomous Vehicle
  - Jan.2016 - Aug.2018
  - Funded by Hyundai Motor Group

- **Derivation of Concept of Rear and Side Collision Detection System Using Machine Learning Technique**
  - Developed an Concept of Rear and Side Collision Detection System
  - Aug.2016 - Dec.2017
  - Funded by Hyundai Motor Group

- **The Development of road feature detection and SLAM based on mono camera**
  - Developed an algorithm for Deep Learning based SLAM
  - Jul.2016 - Dec.2017

- Funded by Hyundai Motor Group

- **Development of laser scanner recognition technology for crossroad collision safety**

  – Developed an algorithm for Low-end 3D LiDAR Sensor
  – Apr.2015 - Mar.2016
  – Funded by Hyundai Motor Group

- **Development of Omni Direction Surroundings Recognition Algorithm using Laser Scanner**

  – Developed an algorithm for Omni Direction Surroundings Recognition for LiDAR Sensor
  – Nov.2013 - Jul.2014
  – Funded by Hyundai Motor Group

- **Development of Target Recognition/Tracking/Classification Algorithm using LIDAR Scanner**

  – Developed an algorithm for Target Recognition System for LiDAR Sensor
  – Oct.2012 - Mar.2013
  – Funded by Hyundai Motor Group

- **Development of Active/Passive Safety Integrated System for Accident Prevention and Injury Reduction**

  – Developed an algorithm for Sensor fusion and Active Collision Warning System
  – Jun.2013 - May.2015
  – Funded by Ministry of Trade, Industry and Energy

PATENT REGISTRATION	Euntai Kim, Beomseong Kim, Baehoon Choi, **Jhonghyun An** *et.al.*, System And Method For Writing Occupancy Grid Map Of Sensor Centered Coordinate System Using Laser Scanner, US patent no:US9827994, Nov.28,2017
	김은태, 최배훈, **안종현**, 외 6인, "도로 경계 검출 시스템 및 방법과 이를 이용한 차량", 등록 101847838, 2017년 5월 2일.
	김은태, 김범성, 최배훈, **안종현**, 외 6인, "레이저스캐너를 이용한 센서중심 좌표계의 점유 격자지도를 작성하는 시스템", 등록 101734654, 2017년 5월 2일.
PATENT APPLICATION	김은태, **안종현**, 조민호, 장원제, 김현주 "도로 지도 생성 시스템 및 도로 지도 생성 방법", 출원 10-2018-0079265, 2018년 7월 9일.
	김은태, **안종현**, 조민호, 장원제, 외 5인, "레이저 스캔 데이터를 이용한 물체의 속도 검출 장치 및 그 방법", 출원 10-2016-0163458, 2016년 12월 2일.
	김은태, **안종현**, 박성근, 김현주, "차량 및 그 제어 방법", 출원 10-2016-0117949, 2016년 9월 13일.

PROGRAMMING
SKILLS   MATLAB, C/C++, Python, ROS Programming

Last updated: March 2, 2022