Curriculum Vitae – JHONGHYUN AN

Personal Information

Jhonghyun An
50, Yonsei-ro, Seodaemun-gu, Seoul
Republic of Korea
tel: +82 51901641
jhonghyen@yonsei.ac.kr
Google Scholar

Research Interest

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

Education

Ph.D. in School of Electrical and Electronic Engineering Yonsei University (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 School of Electrical and Electronic Engineering Yonsei University (2008-2012).
GPA: 3.36 / 4.5

Experiences

2020 Jun → Present Agency for Defense Development(ADD) **Senior Researcher** Unmanned Ground System PMO Team 1

2015 October → 2016 May Yonsei University **Team Leader** of 13th Hyundai Motor Group Future Motor Technology **Autonomous Vehicle Competition**

International Journal

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**), May. 2020. (Accepted)

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. https://ieeexplore.ieee.org/document/8743409/, 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. 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)

Domestic Conference

16 papers on various topics in Korean

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.
Professional Activities	Reviewer of IEEE Intelligent Transportation Systems Society Conference (**IV**)
Programming skills	MATLAB, C/C++, Python, ROS Programming

Last updated: July 3, 2020