HYUNCHUL SHIM, PH.D.
PROFESSOR (TENURED), DIRECTOR,
SCHOOL OF ELECTRICAL ENGINEERING,
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EXECUTIVE SUMMARY

Recognitions. Prof. Hyunchul Shim is internationally recognized as **one of the pioneers of unmanned vehicle research world wide**. Since 1991, he has accrued 30 years of experiences and expertise in the field of unmanned aerial vehicles. With his background, he has made academic, industrial, and practical impacts in the field of unmanned vehicles. Most notably, he created a national joint-ministry project for "Highly Reliable Heterogeneous Unmanned Vehicle Systems" with government funding of 30 Billion KRW in 2014 and now serves as the coordinator of the entire project and **Director of Korea Remotely Piloted Aircraft Research Center in total of 16.8B KRW**, leading 80+ researchers. He has also served as **Director of Intelligent Unmanned Combat Aerial Vehicles**, funded by ADD with 3.9 Billion KRW. In 2019 and 2020, he won the AI Grand Challenge hosted by Korean government and received $2M USD research support.. Accordingly, his contributions have been well recognized to receive **four Minister awards from MSIP, and one Minister commendation from MOLIT, one award from MOTIE**. He also won **Research Grand Prize Award by KAIST in 2020, along with Innovation Award and International Collaboration Award by KAIST** in '12 and '18, respectively. With such background, he is considered as one of the most influential researchers in this field domestically and globally

Publication. He has published 80+ Journal and 280+ Conference papers in the area of UAVs, autonomous cars, robotics and control. According to Google Scholar, his papers has been cited 5,500+ times with H-index of 36. His research results have been published in top robotics journals such as **J. of Field Robotics, IEEE T. of Robotics, T. of Intelligent Transportation Systems** and **Proceedings of IEEE**.

International Visibility. His research is highly visible, attracting international interests. He gave an **invited talk at IROS 2016**, one of the largest Robotics Conference. He was invited to give a talk at **MIT, CalTech, NASA Ames Research Center and NASA Jet Propulsion Laboratory. He was also selected to give a talk at RPAS Symposium hosted by International Civil Aviation Organization(ICAO)**. He served as an **organizing member for IROS 2016, and competition co-chair of IROS since 2016**. He also served as **associate editor for ICRA 2017**. His research was introduced many times in international news media such as **Reuter, AP, Bloomberg, IEEE Spectrum, and Discovery Channel**. In 2018, he was requested by NASA Jet Propulsion Laboratory to join forces for **DARPA Subterranean Challenge**. In 2019, he was selected as a finalist for **Lockheed Martin Alpha Pilot Drone Challenge**. He also serves as government appointed advisor for **ICAO and UN meetings for Lethal Autonomous Weapon Systems**.

Funding. He has secured more than 17 Billion KRW since he joined KAIST, more than **20 Billion KRW** since he joined KAIST back in 2007. Most notably, among 100+ projects he has done, he successfully created a **joint-ministry project on heterogeneous unmanned vehicles with 30 Billion KRW in 2015 and successfully secured more than 20 Billion KRW for KAIST**. With all the funding, in order to perfom high quality research, he has built a variety of test platforms including two two-seater airplanes with 3 ground station trucks, 8 full-size cars for autonomous car research, and literally hundreds of drones.

Service. He served many academic societies including IEEE and AIAA. He served in many committees including 공대혁신위원회, KAIST 50주년 준비위원회, 학부 BK 준비위원회, PR committee in Dept. of Aerospace Eng.

EDUCATION

Doctor of Philosophy, December 2000.
University of California, Berkeley
 Field: Mechanical Engineering
 Dissertation Title: **Hierarchical Flight Control System Synthesis for Rotorcraft-based Unmanned Aerial Vehicles**
 Dissertation Advisor: Professor S. Shankar Sastry (Dept. of EECS, UC Berkeley)
 Major: Control engineering
 Minors: Dynamics, Signal Processing and Computer Vision

Master of Science in Engineering, February 1993.
Seoul National University, Seoul, South Korea
 Field: Mechanical Engineering (Control)
 Thesis Title: A Study on the Design of a Hovering Flight Controller for a Model Helicopter
 Thesis Advisor: Professor Kyo-Il Lee

Bachelor of Science in Engineering, February 1991.
Seoul National University**,** Seoul, South Korea
 Field: Mechanical Engineering
 Advisor: Professor Kunwoo Lee

WORK EXPERIENCE

June 29, 2016 – present
 Director, Korea Civil RPAS Research Center, funded by MOLIT, South Korea

October 10, 2016 – Dec. 2020
 Director, Intelligent UAS Research Laboratory, funded by ADD

September 2013 - present
 Jointly appointed in Multi-disciplinary Robotics Program and Future Vehicle Program.

July 1, 2012 – Dec. 31, 2015
 Director(센터장), Center of Field Robotics for Innovation, Exploration, and Defense, KAIST Institute, South Korea

June 1, 2018 - current
 Associate Professor, School of Electrical Engineering, KAIST, Daejeon, South Korea.

September 1, 2010 - May 31, 2018
 Associate Professor, Dept. of Aerospace Engineering, KAIST, Daejeon, South Korea.

February 22, 2007 – August 31, 2010
 Assistant Professor, Dept. of Aerospace Engineering, KAIST, Daejeon, South Korea

March 1, 2005 – Feb. 28, 2007

Project Manager/Principal Development Engineer, University of California, Berkeley

June 25, 2001 – February 10, 2005
   Staff engineer, Maxtor Corporation, Milpitas, California
   In charge of the advanced servo control system design and test of hard disk drives.

Jan. 1993 – May 1994
   Design Engineer, Hyundai Motor Company, South Korea

SELECTED HONORS AND AWARDS (in Korean)

- 2011 년 9 월 중국 AVIC 사 국제무인기대회 특별상 수상
- **2012 년 12 월 카이스트 기술혁신우수상**
- 2013 년 3 월 산업통상자원부 주최 국제무인항공기 논문공모전 우수상 (제어분야)
- 2013 년 5 월 한국 자동차학회 논문상
- 2013 년 9 월 Qualcomm Paper Award
- **2013 년 9 월 한국항공우주산업/항공우주학회 우수논문상 (사장상)**
- 2014 년 8 월 미국 National Instrument 사 Global Student Design Competition 2 위
- **2015 년 12 월 미래창조과학부 장관상 (창조경제박람회 우수 시연)**
- 2016 년 10 월 IROS Autonomous Drone Challenge 1 위
- **2016 년 11 월 KAI 우수논문상 산업통상자원부 장관상/특별상**
- **2016 년 12 월 미래창조과학부 장관상 우수상 (운전로봇 시연)**
- 2017 년 10 월 Airbus 사 주최 Autonomous Racing Drone Challenge 1 위
- **2018 년 2 월 KAIST 국제협력상**
- 2018 년 10 월 IROS Autonomous Drone Challenge 2 위
- **2018 년 12 월 국토교통부 장관 표창 (자율주행기술발전기여)**
- **2019 년 7 월 현대자동차 주최 자율주행경진대회 3 위**
- **2019 년 7 월 AI 그랜드 챌린지 (과기정통부 주최) 1 위, 장관상 및 12 억원 상금 수상**
- **2020 년 2 월 카이스트 개교 49 주년 연구대상 수상**
- **2020 년 11 월 AI 그랜드 챌린지 (과기정통부 주최) 1 위, 장관상 및 12 억원 상금 수상**

SCI Journal Papers

1. Jung, C; **Shim, DH**; "Incorporating Multi-Context Into the Traversability Map for Urban Autonomous Driving Using Deep Inverse Reinforcement Learning", IEEE ROBOTICS AND AUTOMATION LETTERS, vol.6, no.2, pp.1662~1669, 2021.04; DOI(http://dx.doi.org/10.1109/LRA.2021.3059628)

2. Jung, C; Lee, D; Lee, S; **Shim, DH**; "V2X-Communication-Aided Autonomous Driving: System Design and Experimental Validation", SENSORS, vol.20, no.10, 2020.05; DOI(http://dx.doi.org/10.3390/s20102903)

3. Han, J; Kim, J; **Shim, DH**; "Precise Localization and Mapping in Indoor Parking Structures via Parameterized SLAM", IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, vol.20, no.12, pp.4415~4426, 2019.12; DOI(http://dx.doi.org/10.1109/TITS.2018.2885341)

4. Cho, SW; **Shim, DH**; "Sampling-Based Visual Path Planning Framework for a Multirotor UAV", INTERNATIONAL JOURNAL OF AERONAUTICAL AND SPACE SCIENCES, vol.20, no.3, pp.1~29, 2019.09; DOI(http://dx.doi.org/10.1007/s42405-019-00155-8)

5. Lee, J; **Shim, DH**; Cho, S; Shin, H; Jung, S; Lee, D; Kang, J; "A mission management system for complex aerial logistics by multiple unmanned aerial vehicles in MBZIRC 2017", JOURNAL OF FIELD ROBOTICS, vol.36, no.5, pp.919~939, 2019.08; DOI(http://dx.doi.org/10.1002/rob.21860)

6. Cho, S; **Shim, DH**; "Visual servoing framework using Gaussian process for an aerial parallel manipulator", PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART G-JOURNAL OF AEROSPACE ENGINEERING, vol.233, no.9, pp.3408~3425, 2019.07; DOI(http://dx.doi.org/10.1177/0954410018798145)

7. Moon, H; Martinez-Carranza, J; Cieslewski, T; Faessler, M; Falanga, D; Simovic, A; Scaramuzza, D; Li, S; Ozo, M; De Wagter, C; de Croon, G; Hwang, S; Jung, S; **Shim, H**; Kim, H; Park, M; Au, TC; Kim, SJ; "Challenges and implemented technologies used in autonomous drone racing", INTELLIGENT SERVICE ROBOTICS, vol.12, no.2, pp.137~148, 2019.04; DOI(http://dx.doi.org/10.1007/s11370-018-00271-6)

8. Hong, J; Jung, S; Jung, C; Jung, J; **Shim, DH**; "A general-purpose task execution framework for manipulation mission of the 2017 Mohamed Bin Zayed International Robotics Challenge", JOURNAL OF FIELD ROBOTICS, vol.36, no.1, pp.149~169, 2019.01; DOI(http://dx.doi.org/10.1002/rob.21820)

9. Lee, D; **Shim, DH**; "A Mini-drone Development, Genetic Vector Field-Based Multi-agent Path Planning, and Flight Tests", INTERNATIONAL JOURNAL OF AERONAUTICAL AND SPACE SCIENCES, vol.19, no.3, pp.785~797, 2018.09; DOI(http://dx.doi.org/10.1007/s42405-018-0052-0)

10. Paranjape, AA; Chung, SJ; Kim, K; **Shim, DH**; "Robotic Herding of a Flock of Birds Using an Unmanned Aerial Vehicle", IEEE TRANSACTIONS ON ROBOTICS, vol.34, no.4, pp.901~915, 2018.08; DOI(http://dx.doi.org/10.1109/TRO.2018.2853610)

11. Jung, S; Hwang, S; Shin, H; **Shim, DH**; "Perception, Guidance and Navigation for Indoor Autonomous Drone Racing using Deep Learning", IEEE ROBOTICS AND AUTOMATION LETTERS, vol.3, no.3, pp.2539~2544, 2018.07; DOI(http://dx.doi.org/10.1109/LRA.2018.2808368)

12. Yoon, S; Lee, D; Jung, J; **Shim, DH**; "Spline-based RRT∗ Using Piecewise Continuous Collision-checking Algorithm for Car-like Vehicles", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.90, no.3-4, pp.537~549, 2018.06; DOI(http://dx.doi.org/10.1007/s10846-017-0693-4)

13. Lee, U; Jung, J; Jung, S; **Shim, DH**; "Development of a self-driving car that can handle the adverse weather", INTERNATIONAL JOURNAL OF AUTOMOTIVE TECHNOLOGY, vol.19, no.1, pp.191~197, 2018.02; DOI(http://dx.doi.org/10.1007/s12239-018-0018-z)

14. Jung, S; Cho, S; Lee, D; Lee, H; **Shim, DH**; "A direct visual servoing-based framework for the 2016 IROS Autonomous Drone Racing Challenge", JOURNAL OF FIELD ROBOTICS, vol.35, no.1, pp.146~166, 2018.01; DOI(http://dx.doi.org/10.1002/rob.21743)

15. Shin, HM; Lee, J; Kim, H; **Shim, DH**; "An Autonomous Aerial Combat Framework for Two-on-Two Engagements Based on Basic Fighter Maneuvers", AEROSPACE SCIENCE AND TECHNOLOGY, vol.72, pp.305~315, 2018.01; DOI(http://dx.doi.org/10.1016/j.ast.2017.11.014)

16. Lee, D; Lee, H; Lee, J; **Shim, DH**; "Design, Implementation, and Flight Tests of a Feedback Linearization Controller for Multirotor UAVs", INTERNATIONAL JOURNAL OF AERONAUTICAL AND SPACE SCIENCES, vol.18, no.4, pp.740~756, 2017.12; DOI(http://dx.doi.org/10.5139/IJASS.2017.18.4.740)

17. Lee, JH; Kim, ET; Ryu, H; **Shim, DH**; "Handling Quality Improvements of Fly-By-Wire Helicopter using Combined Model Following Controller with Decoupler", INTERNATIONAL JOURNAL OF AERONAUTICAL AND SPACE SCIENCES, vol.18, no.2, pp.378~387, 2017.06; DOI(http://dx.doi.org/10.5139/IJASS.2017.18.2.378)

18. Kim, J; Jeong, YD; Lee, D; **Shim, DH**; "Landing Control on a Mobile Platform for Multi-copters using an Omnidirectional Image Sensor", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.84, no.1-4, pp.529~541, 2016.12; DOI(http://dx.doi.org/10.1007/s10846-016-0339-y)

19. Lee, J; Choi, HS; **Shim, DH**; "Fault Tolerant Control of Hexacopter for Actuator Faults using Time Delay Control Method", INTERNATIONAL JOURNAL OF AERONAUTICAL AND SPACE SCIENCES, vol.17, no.1, pp.54~63, 2016.03; DOI(http://dx.doi.org/10.5139/IJASS.2016.17.1.54)

20. Yoon, SY; Yoon, SE; Lee, U; **Shim, DH**; "Recursive Path Planning Using Reduced States for Car-Like Vehicles on Grid Maps", IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, vol.16, no.5, pp.2797~2813, 2015.10; DOI(http://dx.doi.org/10.1109/TITS.2015.2422991)

21. Huh, S; Cho, S; Jeong, Y; **Shim, DH**; "Vision-Based Sense-and-Avoid Framework for Unmanned Aerial Vehicles", IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, vol.51, no.4, pp.3427~3439, 2015.10; DOI(http://dx.doi.org/10.1109/TAES.2015.140252.)

22. Shim, I; Choi, J; Shin, S; Oh, TH; Lee, U; Ahn, B; Choi, DG; **Shim, DH**; Kweon, IS; "An Autonomous Driving System for Unknown Environments Using a Unified Map", IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, vol.16, no.4, pp.1999~2013, 2015.08; DOI(http://dx.doi.org/10.1109/TITS.2015.2389237)

23. Choi, HS; Lee, S; Ryu, H; **Shim, DH**; Ha, C; "Dynamics and Simulation of the Effects of Wind on UAVs and Airborne Wind Measurement", TRANSACTIONS OF THE JAPAN SOCIETY FOR AERONAUTICAL AND SPACE SCIENCES, vol.58, no.4, pp.187~192, 2015.07

24. You, DI; **Shim, DH**; "Design of an aerial combat guidance law using virtual pursuit point concept", PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART G-JOURNAL OF AEROSPACE ENGINEERING, vol.229, no.5, pp.792~813, 2015.04; DOI(http://dx.doi.org/10.1177/0954410014539654)

25. Yoon, SY; **Shim, DH**; "SLPA*: Shape-Aware Lifelong Planning A* for Differential Wheeled Vehicles", IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, vol.16, no.2, pp.730~740, 2015.04; DOI(http://dx.doi.org/10.1109/TITS.2014.2340020)

26. Choi, HS; Lee, S; Lee, J; Ryu, H; **Shim, DH**; Ha, C; "Development of an Aircraft Auto-landing Guidance System using Time Delay Control, and Simulation with Crosswind and Aileron Fault", TRANSACTIONS OF THE JAPAN SOCIETY FOR AERONAUTICAL AND SPACE SCIENCES, vol.58, no.1, pp.23~29, 2015.01

27. Song, BD; Kim, JH; Kim, J; Park, H; Morrison, JR; **Shim, DH**; "Persistent UAV Service: An Improved Scheduling Formulation and Prototypes of System Components", JOURNAL OF INTELLIGENT ROBOTIC SYSTEMS, vol.74, no.1-2, pp.221~232, 2014.04; DOI(http://dx.doi.org/10.1007/s10846-013-9970-z)

28. Kim, J; **Shim, DH**; Morrison, JR; "Tablet PC-based Visual Target-Following System for Quadrotors", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.74, no.1-2, pp.85~95, 2014.04;

DOI(http://dx.doi.org/10.1007/s10846-013-9952-1)

29. 신희민; 유동일; **심현철**; "Autonomous Shipboard Landing Algorithm for Unmanned Helicopters in Crosswind", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.74, no.1-2, pp.347~361, 2014.04; DOI(http://dx.doi.org/10.1007/s10846-013-9927-2)

30. Moon, S; Oh, E; **Shim, D.H**; "An Integral Framework of Task Assignment and Path Planning for Multiple Unmanned Aerial Vehicles in Dynamic Environments", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.70, no.1-4, pp.303~313, 2013.04; DOI(http://dx.doi.org/10.1007/s10846-012-9740-3)

31. Cho, SW; Huh, SS; **Shim, DH**; Choi, HS; "Vision-Based Detection and Tracking of Airborne Obstacles in a Cluttered Environment", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.69, no.1-4, pp.475~488, 2013.01; DOI(http://dx.doi.org/10.1007/s10846-012-9702-9)

32. Jung, Y; **Shim, DH**; "Development and Application of Controller for Transition Flight of Tail-Sitter UAV", JOURNAL OF INTELLIGENT ROBOTIC SYSTEMS, vol.65, no.1-4, pp.137~152, 2012.01; DOI(http://dx.doi.org/10.1007/s10846-011-9585-1)

33. Choi, HS; Kim, ET; You, DI; **Shim, DH**; "Improvements in Small-scale Helicopter Rotor Modeling for the Real-time Simulation of Hovering Flight", TRANSACTIONS OF THE JAPAN SOCIETY FOR AERONAUTICAL AND SPACE SCIENCES, vol.54, no.185-86, pp.229~237, 2011.11

34. Chung, H; Oh, S; **Shim, DH**; Sastry, SS; "Toward Robotic Sensor Webs: Algorithms, Systems, and Experiments", PROCEEDINGS OF THE IEEE, vol.99, no.9, pp.1562~1586, 2011.09

35. Oh, H; Won, DY; Huh, SS; **Shim, DH**; Tahk, MJ; Tsourdos, A; "Indoor UAV Control Using Multi-Camera Visual Feedback", JOURNAL OF INTELLIGENT ROBOTIC SYSTEMS, vol.61, no.1-4, pp.57~84, 2011.03; DOI(http://dx.doi.org/10.1007/s10846-010-9506-8)

36. You, DI; **Shim, DH**; "Autonomous Formation Flight Test of Multi-Micro Aerial Vehicles", JOURNAL OF INTELLIGENT ROBOTIC SYSTEMS, vol.61, no.1-4, pp.321~337, 2011.03

37. Choi, HS; Lee, SJ; Lee, JH; Kim, ET; **Shim, DH**; "Aircraft Longitudinal Auto-landing Guidance Law Using Time Delay Control Scheme", TRANSACTIONS OF THE JAPAN SOCIETY FOR AERONAUTICAL AND SPACE SCIENCES, vol.53, no.181, pp.207~214, 2010.11; DOI(http://dx.doi.org/10.2322/tjsass.53.207)

38. Huh, S; **Shim, DH**; "A vision-based landing system for small unmanned aerial vehicles using an airbag", CONTROL ENGINEERING PRACTICE, vol.18, no.7, pp.812~823, 2010.07; DOI(http://dx.doi.org/10.1016/j.conengprac.2010.05.003)

39. Huh, S; **Shim, DH**; "A Vision-Based Automatic Landing Method for Fixed-Wing UAVs", JOURNAL

OF INTELLIGENT & ROBOTIC SYSTEMS, vol.57, no.1-4, pp.217~231, 2010.01; DOI(http://dx.doi.org/10.1007/s10846-009-9382-2)

40. **Shim, DH**; Han, JS; Yeo, HT; "A Development of Unmanned Helicopters for Industrial Applications", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.54, no.1-3, pp.407~421, 2009.03

41. **Shim, DH**; Chung, H; Sastry, SS; "Conflict-free navigation in unknown urban environments - Autonomous exploration for unmanned aerial vehicles", IEEE ROBOTICS AUTOMATION MAGAZINE, vol.13, no.3, pp.27~33, 2006.09; DOI(http://dx.doi.org/10.1109/MRA.2006.1678136)

42. **Shim, DH**; Lee, HS; Guo, L; "Mixed-objective optimization of a track-following controller using linear matrix inequalities", IEEE-ASME TRANSACTIONS ON MECHATRONICS, vol.9, no.4, pp.636~643, 2004.12; DOI(http://dx.doi.org/10.1109/TMECH.2004.839043)

43. Kim, HJ; **Shim, DH**; "A flight control system for aerial robots: algorithms and experiments", CONTROL ENGINEERING PRACTICE, vol.11, no.12, pp.1389~1400, 2003.12; DOI(http://dx.doi.org/10.1016/S0967-0661(03)00100-X)

44. Vidal, R; Shakernia, O; Kim, HJ; **Shim, DH**; Sastry, S; "Probabilistic pursuit-evasion games: Theory, implementation, and experimental evaluation", IEEE TRANSACTIONS ON ROBOTICS AND AUTOMATION, vol.18, no.5, pp.662~669, 2002.10; DOI(http://dx.doi.org/10.1109/TRA.2002.804040)

International Conference Papers

1. Kim, T, **Shim, DH**, "Road Semantic Segmentation Oriented Dataset for Autonomous Driving", ICCE-Asia 2020, Paradise Hotel Busan, KO, 2020.11.01, pp.255~257

2. Jung, C, Lee, D, Kim, BS, **Shim, DH**, "Lane Level Path Planning for Urban Autonomous Driving using Vector Map", International Conference On Consumer Electronics (ICCE) Asia, Paradise Hotel Busan, KO, 2020.11.01

3. Ryu, Hj, Wee, IH, Kim, T, **Shim, DH**, "Heterogeneous sensor fusion based omnidirectional object detection", 20th International Conference on Control, Automation and Systems, ICCAS 2020, Online, KO, 2020.10.13

4. Jung, C, Seong, HK, **Shim, HC**, "Time-to-Line Crossing Enhanced End-to-End Autonomous DrivingFramework", IEEE International Conference on Intelligent Transportation, Virtual, GR, 2020.09.20

5. Kim, D, Ryu, H, Yonchorhor, J, **Shim, DH**, "A Deep-learning-aided Automatic Vision-based Control Approach for Autonomous Drone Racing in Game of Drones Competition", Thirty-third Conference on Neural Information Processing Systems, NeurIPS 2019, Vancouver Convention Center, CN, 2019.12.08

6. Kim, T, Wee, I, **Shim, DH**, "Occlusion Robust Object Detection and Tracking on a Real-time Drone", 2019 19th International Conference on Control, Automation and Systems, ICC Jeju, KO, 2019.10.15

7. Wee, I, Lee, DS, Kim, T, **Shim, DH**, "Diurnal Motion of Constellations using 150 Drones", 2019 19th International Conference on Control, Automation and Systems, ICC Jeju, KO, 2019.10.15

8. Lee, EM, Wee, I, Kim, T, **Shim, DH**, "Comparison of Visual Inertial Odometry using FlightGoggles Simulator for UAV", 2019 19th International Conference on Control, Automation and Systems, ICC Jeju, KO, 2019.10.15

9. Lee, J, **Shim, DH**, Kim, S, "Electro-Optical Sensor Selection based on Flight Test for Detect-and-Avoid in Phase Two UAS", 38th IEEE/AIAA Digital Avionics Systems Conference, DASC 2019, Hilton San Diego Resort & Spa, US, 2019.09.08

10. Lee, J, Lee, H, **Shim, DH**, "Low-SWaP EO sensor-based Robust Aircraft Detection for DAA Technology in UAS Integration", AIAA Information Systems-Infotech At Aerospace Conference, Manchester Grand Hyatt San Diego, San Diego, US, 2019.01.07

11. Jung, C, Jung, SW, **Shim, DH**, "A Hybrid Control Architecture For Autonomous Driving In Urban

Environment", International Conference on Control, Automation, Robotics and Vision, Marina Bay Sands Expo & Convention Centre, Singapore, SI, 2018.11.18

12. Wee, I, Lee, D, **Shim, DH**, "Button Filtering for Converting Image to Coordinates of Swarming Drones ", 18th International Conference on Control, Automation and Systems (ICCAS), YongPyong Resort, PyeongChang, KO, 2018.10.17, pp.850~855

13. Lee, J, Shin, D, Ryu, H, Lee, D, **Shim, DH**, "Fault Tolerant Adaptive Control using Time Delay Control Scheme under Motor Faults of Octocopter", 7th International Conference on Systems and Control (ICSC), Univ Politecnica Valencia, Valencia, SPAIN, US, 2018.10.24, pp.123~128

14. Lee, J, Hwang, S, **Shim, DH**, "Consideration of Airborne Detection System for DAA Technology in Remote Pilot Aircraft Systems", IEEE/AIAA 37th Digital Avionics Systems Conference (DASC), Hotel Ibis London Earl's Court, UK, 2018.09.23, pp.300~304

15. Lee, D, **Shim, DH**, "Development of Mini-Drones and Feedback Linearization Based Velocity Control for Outdoor Autonomous Swarming Flights", 12th IFAC Symposium on Robot Control, Budapest Congress & World Trade Center, HU, 2018.08.27

16. Jung, SG, Lee, S, Hwang, S, **Shim, DH**, "Real Time Embedded System Framework for Autonomous Drone Racing using Deep Learning Techniques", AIAA Information Systems-AIAA Infotech@ Aerospace, 2018, Gaylord Palms, Kissimmee, Florida, US, 2018.01.07

17. Lee, H, Lee, D, Jung, SG, **Shim, DH**, "Design of Tracking System using Bayesian Position Prediction for Highly Maneuvarable Aerial Target", AIAA Information Systems-AIAA Infotech@ Aerospace, 2018, Gaylord Palms, Kissimmee, Florida, US, 2018.01.07

18. Lee, J, Shin, HM, **Shim, DH**, "Path-planning with collision avoidance for operating multiple Unmanned Aerial Vehicles in same airspace", AIAA Information Systems-AIAA Infotech@ Aerospace, 2018, Gaylord Palms, Kissimmee, Florida, US, 2018.01.07

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Patents

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SELECTED INVITED TALKS

- **2011 년 5 월 24 일 NASA Ames Research Center invited talk "Sense-n-Avoid for UAVs"**

- **2011 년 12 월 16 일 미국 UC Berkeley 무인기 연구 발표**

- **2012 년 2 월 16 일 미국 Naval Postgraduate School (NPS) 방문, 무인항공기 연구 발표**

- **2012 년 8 월 7 일 NASA Ames Research Center 방문, 초청강연**

- **2012 년 8 월 10 일 Brigham-Young Univ. 초청강연**

- 2013 년 2 월 4 일 일본 동경대학교 Center of Excellence 5th Aerospace Innovation Workshop

- **2013 년 8 월 16 일 MIT 항공우주공학과 초청 연구 발표 (Prof. Jonathan How)**

- 2015 년 10 월 15 일 한림원 초청 한국-호주 워크샵 "자율주행기술 동향 및 발전방향"

- **2016 년 1 월 27 일 LG 전자 글로벌 전략회의 초청강연 ('16.1.27)**

- **2016 년 4 월 11 일 UN Geneva 초청 Lethal Autonomous Weapon System 전문가 발표**

- **2016 년 4 월 27 일 삼성전자 사장단회의 초청 강연**

- **2016 년 6 월 25 일 세계경제포럼 여름 다보스 행사 초청 로봇 기술 시연**

- 2016 년 10 월 한국과학한림원 초청 드론 기술 발표

- **2016 년 10 월 IROS Special Forum 발표: "From theory to Policy"**

- **2016 년 9 월 8 일 국방부 장관 초청 서울 안보대화 회의 전문가 초청 발표**

- **2017 년 2 월 13 일 RTCA SG-228 WG1 발표**

- **2017 년 5 월 22-23 일 국제무인기 워크샵 개최 및 발표(NASA 주요인사 참석)**

- **2017 년 6 월 27 세계경제포럼 Annual Meeting of New Champions AI&Robotics 초청발표**

- **2017 년 7 월 11 일 Caltech 방문, 세미나**

- **2017 년 7 월 12 일 미국 NASA Armstrong 방문, 연구내용 발표**

- **2017 년 7 월 19 일 한미연합사 방문(용산), 군 수뇌부 대상 강연**

- **2017 년 9 월 7 일 국방부 장관 초청 서울 안보대화 회의 전문가 초청 발표**

- **2017 년 9 월 28 일 IROS Indoor Navigation Tutorial Session Talk**

- **2017 년 11 월 10 일 포스코 회장단 초청 강연**

- **2017 년 11 월 14 일 UN Geneva Office Governmental Expert 자율살상무기 관련 패널발표**

- **2018 년 5 월 18 일 UN Geneva Office 초청 발표 (인공지능과 무기시스템 개발 현황)**

- **2018 년 9 월 11 일 ICAO 초청 RPAS Symposium 주제 발표 (AI for Civil Aviation)**

- **2018 년 9 월 18 일세계경제포럼 Annual Champion of New Champions 패널 발표**

- **2018 년 6 월 28 일 과총 연차포럼 발표**

- **2018 년 10 월 17 일 NASA Jet Propulsion Laboratory 초청발표**

- **2019 년 5 월 17 일 SK 강연**

- **2019 년 6 월 26 일 육군 매드사이언티스트 발표**

- **2019 년 8 월 13-1 일 UN 본부 Stimson Center AI Militarization Session 참여**

- 2020 년 4 월 KAOS 재단 강연

- **대형과제**
  - **고신뢰성 다개체 무인이동체 통합운용체계 구축 과제 기획 (300 억원)**
    - **국토부 민간무인기안전운항연구단 유치 (168 억원/6 년)**
    - **과기부 "고신뢰성 무인이동체 통신 및 보안기술" 과제 유치 (42 억원/6 년)**
    - **해수부 "고신뢰성 무인선 통합운용기술 " 과제 유치 기여 (28 억원/6 년)**
    총 238 억원 규모 과제 카이스트 유치에 핵심적 기여.
    본인은 국토부 연구단 유치 및 현재 연구단장 역임중.
  - **국방과학연구소 지능형 무인기 특화연구실 유치, 특화연구실장 역임중 (39 억원/6 년)**

- **연구재단 주요 과제**
  거대과학과제:인공위성 근접운용을 위한 영상 LIDAR 통합 자율항법 기술연구 5 억원/5 년
  중견핵심과제: 고기동성 무인기 근접전투기동 연구: 3 억원/3 년

- **기타 주요 정부지원 과제**
  무인항공기 연구과제 다수 수주: 국방과학연구소, 산업부, 국토부 등(세부자료 참고)
  자율주행기술 관련 연구 수주
  - 정밀지도구축과제: 산업부, 5 억/5 년
  - End-to-end 자율주행기술과제: 산업부, 6.9 억원/4 년
  - **과기정통부 주최 AI Grand Challenge 우승('19.7), 6 억원** 연구예산 지원받을 예정

- **산업체 주요과제**
  자율주행차관련: 현대자동차, 삼성, NAVER 과제 수행
  무인항공기 관련: 한국항공우주산업 등

- **외국 지원 과제: MBZIRC 2017(1 억 5 천만원), MBZIRC 2020(3 억원)**

OUTSIDE CONLSUTING RECORDS

- 국무조정실하 신산업투자위원회 위원 (2016.3-현재)

- 국토교통부 지정 International Civil Aviation Organization(ICAO) RPAS Panel Advisor

- 외교부 요청 UN Lethal Autonomous Weapson Systems Group of Governmental Experts
    Spring 2016, Fall 2017, May 2018, August 2019

- World Economoic Forum (WEf): Global Future Council (2016-2018): AI&Robotics Division

- 삼성전자 회장단 강연

- LG 전자 회장단 강연

- 금호 아시아나 회장단 강연

- 삼성전자 DMC 연구소 자문 (2015-2017)

- LG 전자 자문 (2019-2021)

- 롯데 경영자 과정 강연 (2019-21)

- 특허청 강연

- 세종시 UAM 자문위원

- 연세대 경영자 과정

Major Media Coverages

- Aviation Week & Space Technology 기사: Korea UCAV (2009 년)

- 택배 무인기 시연 전국방송 (KBS, YTN, 주요일간지) ('14.4.11)

- 영국 BBC Gadget Show 촬영('14.6.11) 및 방영 ('15.1)

- IEEE Spectrum (Tiny Humanoid Robot Learning to Fly Real Airplanes, '14.9.18.)

- Reuter TV Pibot 연구 소개 ('14.10.21)

- IEEE Spectrum 연구 소개 (Hyundai Robocar Competition, '14.11.18)

- KBS 세계인 ('15.3.18) 무인기 관련

- IEEE Spectrum 연구 소개 (South Korea Prepares for Drone vs. Drone Combat, '15.4.1)

- KBS 세계인 ('15.4.8) 자율주행차량 관련

- KBS 장영실쇼 ('15.5.17): 드론 특집

- KBS 명견만리 ('15.7.23)

- KBS 드로니안 미래를 날다 ('15.8.9)

- MBC 8 시 뉴스: "드론 잡는 드론" ('16.1.20)

- 조선 Biz "30/40 뉴리더 드론 연구자 1 세대 심현철 교수" (16.2.10)

- YTN 뉴스 생방송 ('16.3)

- EBS Job 쇼 ('16.8)

- Economist 지 연구 소개 "Flight ('16.8)

- IEEE Spectrum 연구소개 Pibot ('16.10)

- MBC Pibot 개발 (MBC 뉴스데스크) ('16.12.8.)

- Discovery Channel 고속 자율주행 레이싱카 개발 (Daily Planet) ('17.10 방영)

- EBS flying car 연구동향 무인항공기/자율주행차량

- KBS 사과콘 ('17.10.26.)

- YTN Science 강연 ('18.4.9)

- 동아사이언스 인터뷰 ('18.4.3)

- MBC 라디오 ('18.11)

- EBS 출연 ('20.9)