JOONGEUP KYE

Curriculum Vitae

MECHATRONICS & ROBOTICS DESIGNER and TECHNOLOGY PLANNER

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Joongeup Kye is active as an expert in the fields of weapon systems and mobile robots, possessing 36 years of R&D and technology planning experience.

Main career highlights include conducting weapon system development and test evaluation at the Defense Agency for Technology and Quality (DTaQ), and researching positioning technology for mobile robots as a specialist at the Electronics and Telecommunications Research Institute (ETRI).

Served as the Head of the Major Industries Team and the Head of the Industrial Convergence Team at the Korea Planning & Evaluation Institute of Industrial Technology and Office of Strategy & Planning (KEIT/OSP).

Additionally, while cultivating master's & doctoral candidates at Sogang University (& Sunmoon Univ., operated the Intelligent Robotics Research Institute and conducted joint academia-industry collaboration activities). Currently, Engaged in testing and certification work in the robotics field at the Korea Testing Laboratory (KTL).

EXPERIENCE

2024/Sep. ~ Research Fellow (Robot Testing and Certification Center), **Korea Testing Laboratory (KTL)**
Intelligent robotics, autonomous vehicle technology, reliability certification platform development

2022/Dec. ~ 2023/Apr. Director of Planning & Coordination, **Daejeon-Sejong-Chungnam Regional Innovation System (DSC-RIS)**
Operation of Human Resource Education and Smart Mobility R&D Plojects

2020/Feb. ~ 2024/Aug. Professor (President, Intelligent Robotics Research Institute), **Sogang (& SMU) University**
Human Resource Education, Industrial Platform and Service Robot R&D Plojects,
Research on military wearable robots, Research on mobile robots using UWB and RGB sensors

2015/Jul. ~ 2020/Dec. Research Fellow, **Korea Planning & Evaluation Institute of Industrial Technology (KEIT)**
Industry (Machinery, Automotive, Robotics) Technology Planning PM (Team Leader)

2010/Jul. ~ 2015/Jul. Principal Researcher (Expert Committee Member, Defense & Intelligent Robotics Research Institute), **Electronics and Telecommunications Research Institute (ETRI)**
Research and development of positioning and navigation for intelligent robots and autonomous vehicles

1989/Sep. ~ 2010/Jun. Senior Researcher, **Defense Agency for Technology and Quality (DTaQ)**
Defense Unmanned Robot Technology Planning PM, Unmanned Systems (UGV, UUV) Research, Development and Test Evaluation of Weapon Systems (K2, K9(Auto-Gun Laying System), KDX Ⅱ, LPX (Search RADAR)). Establishment of Defense Science and Technology Promotion Implementation Plan (Defense R&D Mid-to-Long-Term Plan and Core Technology Planning)

EDUCATION

2000/Aug. Ph.D. in Mechatronics Laboratory (Robust Control), **Pusan National University** Pusan, South Korea
Dissertation Title: Performance Evaluation of Stabilization Systems and Design of Robust Controllers
Research Advisor: Mahn-Hyung Lee

1996/Feb. M.S. in Mechatronics Laboratory (Control Design), **Pusan National University** Pusan, South Korea
Thesis Title: Study on the K9 Control Characteristics of Heavy-Load Electro-Hydraulic Drive Systems
Research Advisor: Mahn-Hyung Lee

1989/Feb. B.S. in Mechanical Engineering, **Hong-Ik University** Seoul, South Korea
A Study on the Characteristics of Rotating Blades in Side-Flow Fluid Machinery

RESEARCH & WORK HIGHLIGHT

Academia

- Development of Wearable Robots for Persons with Disabilities and Collaborative Robots (EtherNet_IP, Reliability) (MOTIE, Ministry of Trade, Industry and Energy)
- Wearable Robot Actuator (Civil-Military Dual-Use Technology Development, Civil-Military Cooperation Promotion Agency), Research on Characterizing Wearable Robots by Mission Type (ADD, Agency for Defense Development)
- UWB sensor technology development for mobile robots, vacuum dual transfer robot technology development (for semiconductor wafer transfer) (LINC 3.0, National Research Foundation of Korea)
- Autonomous driving positioning technology development using RGB sensors (KIMM, Korea Institute of Machinery and Materials)

Industry.

- Research and Development/Testing and Evaluation of Unmanned Systems (UGV, UUV (SONAR))
- Defense Research and Development (Sep. 1989 ~ Dec. 2005)
  - Development of K1A1 (GTDSS, Gun & Turret Stabilization Systems) and K9 (AGLS, Auto-Gun Laying Systems)
  - Development of Domestic Production for Weapon System Components (Multi-Beam Side Scan Sonar, Electric-Hydro Servo Valve, Power and Suspension Systems)
  - Development and Testing/Evaluation Naval Weapon Systems (KDX, Air defense radar (SMART-L) for LPX))
- Defense Technology Planning (Jan. 2006 ~ Jun. 2010)
  - Defense Core Technology Planning Research, Defense Technology Roadmap Establishment
  - Defense Science and Technology Level Survey
- Robot Research and Development (Jul. 2010 ~ Mar. 2015)
  - R&D Project Title: “Development of Road-Based Robot Autonomous Driving Technology Resilient to Outdoor Environments”, ETRI (Electronic & Telecommunication Research Institute)
  - Research Content: Sensor fusion-based environmental modeling and perception technology, road-based autonomous driving control technology, module fusion and integrated operation system technology, and demonstration operation

TRAINING

Domestic Contract Education

- System Engineering Education (SEER Model), Korea Testing Laboratory, Feb. 2008
- ISO 9001 Certification (Senior Quality Management System Auditor Training), Korea Testing Laboratory, May 2024
- KS Q ISO/IEC 17025 Operational Practices Training for KOLAS, Korea Testing Laboratory, Jun. 2024
- Measurement Uncertainty Education Training for KOLAS, Korea Laboratory Accreditation Scheme, Oct. 2024

Overseas Training Program

- THALES Netherlands (SMART-L System Integration and Acceptance Testing), Apr. ~ Sep. 2005.
- M109A6 Self-Propelled Howitzer Technical Training, BMY, USA, Jun.~ Jul. 1992

PUBLICATION

Doctoral dissertation

1. **Joongeup Kye**, “Performance evaluation and robust controller design of a line of sight stabilization system”, Ph.D. Thesis, Pusan National University, Aug. 2000

Master’s dissertation

2. **Joongeup Kye**, “Study on Control Characteristics of Heavy-Load Electro-Hydraulic Drive Systems”, Master’s Thesis, Pusan National University, Feb. 1996

Journal Paper

3. Rahul Ranjan, **Joongeup Kye**, "Comparative Analysis of Integrated Filtering Methods Using UWB Localization in In door Environment", **Sensors**, 2024, [I.F:3.9] https://doi.org/10.3390/s24041052.
4. Rahul Ranjan, **Joongeup Kye**, "Design of Tactical Multipurpose All-Terrain Mobile Robot", **IJMST, SCOPUS**, vol. 10, No. 2, Oct. pp. 2224-37, 2023
5. J. Y. Seong, Ranjan, R., S. C. Lee, **Joongeup Kye**, "Enhancing Industrial Communication with Ethernet/Internet Prot ocol: A Study and Analysis of Real-Time Cooperative Robot Communication and Automation via Transmission Cont rol Protocol/Internet Protocol", **Sensors**, 2023, [I.F: 3.9] https://doi.org/10.3390/s23208580.
6. K. T. Lee, **Joongeup Kye**, "A Study on the Method of Wearable Robot by Mission Type", Journal of Korea Robotics Society, ISSN-1975-6291, eISSN-2287-3961, Dec. 2017
7. **Joongeup Kye**, C. D. Lim, "Applications and Strategies on Defense Acquisition based CPS & IoT Technology", ISSN 1225-6455, ETRI Journal, Dec. 2015
8. **Joongeup Kye**, J. H. Lee, D. S. Lim, "Trends and Strategies on Defense Information Technology based IT Convergence Technology", ISSN 1225-6455, ETRI Journal, Apr. 2013
9. **Joongeup Kye**, "Trends and Acquisition Strategies on Defense Unmanned Robot Core Technology", ISSN 1225-6455, ETRI Journal, Jun. 2014
10. **Joongeup Kye**, J. I, Joe, "Trends and Applications on Multi-beam Side Scan Sonar Sensor Technology", ISSN 1225-6455, ETRI Journal, Dec. 2013
11. Y. S. Jang, **Joongeup Kye**, "Disturbance Rejection and Attitude Control of the Unmanned Firing System of the Mobile Vehicle", Journal of the Institute of Electronics Engineers, vol 44, SC Edition, No. 3, May. 2007
12. Y. S. Jang, **Joongeup Kye**, "Development of the Side Scan Sonar Using the Multi-beam Sensors : Sensor Design", ISSN 1229-6287, Vol 54, 10-D, Journal of the Korean Institute of Electrical Engineers, 2005
13. **Joongeup Kye,** Manhyung Lee, "Robust Controller Design for a Stabilized Head Mirror", International Journal of the Korean Society of Precision Engineering, Vol. 3. No. 4., Oct. 2002
14. Wongu Lee, **Joongeup Kye**, Manhyung Lee, "Dynamic Characteristic Analysis and LMI-based H∞ Controller Design for a Line of Sight Stabilization System", KSME International Journal Vol. 16, No. 10., Oct. 2002

Conference Paper

15. J. J. Kim, **Joongeup Kye**, "Development and Reliability Evaluation of a Performance Testing Method for Vacuum Suction Grippers in Logistics Robots", 2025 Fall Conference, KSPE, Nov. 2025
16. S. H. Han, **Joongeup Kye**, "A Study on Development of a Common Platformn for Advanced Logistics Service Robots", Conference of the Korean Society of Industrial Convergence, Jul. 2025
17. Eang Chanthol, S. J. Lee, **Joongeup Kye**, "A Study on the Gradient descent based to minimize distance loss in UWB indoor localization", TP1-1-27, KRoC 2024, Feb. 2024
18. Rahul R., **Joongeup Kye**, "UWB Sensor Localization based on LRF and KF for Unmanned Vehicle", International Conference on Control, Automation and Systems (ICCAS 2023), Oct. 2023
19. F. A. Rahul Ranjan, **Joongeup Kye**, "Improving Indoor Positioning Systems with UWB and Filtering Techniques: A Comparative Analysis," 2023 23rd, IEEE, International Conference on Control, Automation and Systems (ICCAS), Yeosu, Korea, Republic of, 2023, pp. 1133-1136, doi: 10.23919/ICCAS59377.2023.10316857.
20. Rahul Ranjan, S. H. Kim, K. O. Lee, **Joongeup Kye**, "UWB Sensor Localization based on LPF and KF for Unmanned Vehicle", Proceedings of the National Conference of the Control and Robotics Systems Society (ICROS), 2023, 82,83, https://www.dbpia.co.kr/journal/articleDetailnodeId=NODE11480217
21. **Joongeup Kye**, "A Study on Precise Position Control of Cooperative Robot Manipulator for Smart Factory", Conference of the Korean Society of Industrial Convergence, May. 2023
22. Rahul Ranjan, **Joongeup Kye**, "Design of a Multipurpose Combat Mobile Robot using Localization Sensor," 2022 22nd, IEEE,International Conference on Control, Automation and Systems (ICCAS), Jeju, Korea, Republic of, 2022, pp. 1684-1686, doi: 10.23919/ICCAS55662.2022.10003907.
23. S. Bajpai, Rahul Ranjan, S. C. Lee, K. O. Lee, **Joongeup Kye**, "Development of Ethernet/IP Adapter for Explicit Messaging in Cooperative Robot Communication", International Conference on Control, Automation and Systems (ICCAS 2022), Nov. 2022, pp. 103-105, doi: 10.23919/ICCAS55662.2022.10003850.
24. **Joongeup Kye**, "Study on String Lifetime Evaluation of Twisted String Actuators applied on soft wearable robot", The Korean Society of Mechanical Engineers Annual Conference, Nov. 2022

25. B. G. Lee, **Joongeup Kye**, "A Study on the Development of a Large-Scale Transport Drone System Military Drone", Korean Society of Automotive Engineers Spring Academic Conference, May 2019
26. **Joongeup Kye**, B. G. Lee, "A Study of the Implementation of Required Operation Capability to Unmanned Ground Vehicle", Korean Society of Automotive Engineers Academic Conference, Oct. 2014
27. **Joongeup Kye**, W. S. Choi, A. Y. Kim, "Implementation of High-Resolution Image analysis Side Scan Sonar using Multi-beam Array Processing", Spring Conference of the Control Robotics Systems Society, 2014
28. **Joongeup Kye**, W. P. Yoo, "Implementation of Robot Shuttle Platform for Unmanned Autonomous Mobile Robot", Korean Society of Automotive Engineers Academic Conference, Oct. 2013
29. J. W. Kim, **Joongeup Kye**, "Adaptive Driving Assistance System for Military Vehicle", Korean Society of Automotive Engineers Academic Conference, Oct. 2013
30. J. D. Choi, **Joongeup Kye**, "Autonomous Valet Parking System Autonomous Valet Pakring", Korean Society of Automotive Engineers Academic Conference, Oct. 2012
31. **Joongeup Kye**, W. S. Choi, "The study for Priority Assessment Implementation on Risk-Return Model Defense Technology Planning,Database,Priority Assessment Model,Risk-Return Analysis", Conference of the Control Robotics Systems Society, 2012
32. J. Jong, **Joongeup Kye**, "Future Warfare Scenarios and Weapon System Development Directions", Conference of the Control Robotics Systems Society, 2012
33. J. H. Hwang, **Joongeup Kye**, "Behavior model of Biologically Inspired Robot for Surveillance and Reconnaissance", Conference of the Control Robotics Systems Society, 2009
34. **Joongeup Kye**, "Current Status of Unmanned Underwater Vehicle (UUV) Technology and Strategy for Securing Core Technologies", ISSN 1975-776X, Defense Science and Technology Information Journal, 2008
35. Y. S. Jang, **Joongeup Kye**, "Attitude Control of the Unmanned Robot System Using Disturbance Observer", The Korean Institute of Electrical Engineers Conference, 2006
36. Y. S. Jang, **Joongeup Kye**, "Study on Development of Side Scan Sonar Using Multi-beam Sensors Towfish", Korean Society of Marine Engineering, 2006
37. Y. S. Jang, **Joongeup Kye**, "Research on Development of Side Scan Sonar Using Multi-beam Sensors", The Korean Society for Precision Engineering Academic Conference, Oct. 2004
38. **Joongeup Kye**, Manhyung Lee, Byeongil Kim, "Design of 6-DOF Attitude Controller of the UAV Simulator's Hovering Model", ICCAS 2004, Aug. 2004

Workshop & Seminar Paper

39. **Joongeup Kye**, "Development Strategy for a Wearable Robot Platform Capable of Responding to LLM-AI", Wearable Robot Demonstration Center Results Sharing Workshop, Dec. 2025
40. **Joongeup Kye**, "Strategy for Promoting Civil-Military Cooperation in Defense Unmanned Systems for Humanoid Robot", OSP (Office of Strategy and Planning), Jul. 2025
41. **Joongeup Kye**, "Strategy for Defense R&D and Acquisition of Defense Robotics Platforms", Jeonbuk-Do, Jul. 2024
42. **Joongeup Kye**, "Smart Manufacturing DX Implementation Strategy", Busan Robot Industry Promotion Agency, Jun. 2024
43. **Joongeup Kye**, "The Present and Future of Defense Unmanned Vehicle Technology", International Unmanned Systems Conference, Unmanned Vehicle Association, COEX, Sep. 2023
44. **Joongeup Kye**, "Human Performance Augmentation Wearable Robot Platform", Korea Institute of Industrial Technology (Robotics Research Division), Sep. 2021
45. **Joongeup Kye**, "Concept of Unmanned Combat Vehicle Operation in Strategic Environment", KRIS Report, Oct. 2022
46. **Joongeup Kye**, "Defense R&D and Defense Unmanned Vehicle Technology", Chungcheongnam-do Science and Technology Promotion Agency (CIAST), Mar. 2022
47. **Joongeup Kye**, "Industrial Technology R&D and New Market Creation Strategies", Chungcheongnam-do Science and Technology Promotion Agency (CIAST), Feb. 2022
48. **Joongeup Kye**, "Strategy for Acquiring Defense R&D and Defense Robot Platforms", Korea Testing Laborarory (KTL), Sep. 2024
49. **Joongeup Kye**, "Strategy for Defense R&D and Acquisition of Defense Robotics Platforms", Chungcheongnam-do, Aug. 2023

Book Chapter

50. **Joongeup Kye**, "Robot Cloud Platform and Business Model Trends for Robot Convergence Integrated Platform", OSP (Office of Strategy and Planning), MOTIE, Jul. 2025
51. **Joongeup Kye, "**Defense Industry Innovation Cluster Planning Report", Chungnam-Do, Nkov. 2025
52. **Joongeup Kye**, "Investment Analysis for Intelligent Robots in Response to the Fourth Industrial Revolution", ISSN 979-89-97568-62-8, MOTIE, Mar. 2017
53. H. S. Park, **Joongeup Kye**, "Current Status and Development Directions of Defense Robotics Technology", PD Issue Report, KEIT, 2014
54. S. S. Park, **Joongeup Kye**, "Robotics Industry Investment Analysis", Korea Institute for Industrial Economics & Trade (KIET), 2018

PATENTS

Application

1. 10-2022-0111452, Wearable Robot Wire Twist Tensile Testing System
2. 10-2023-0006280, System for Acquiring Coordinate Data Using UWB on ROS
3. 10-2023-0007699, Positioning System for Mobile Objects Using Composite Sensors Linked with GNSS Antennas
4. 10-2023-0161026, Wire Twist Tensile Tester for Harsh Environments
5. 10-2023-0196033, DQN-EKF-Based Distance Loss Optimization Method for UWB Positioning
6. ***International Patent Application*** PCT/KR2023/007370, *Wearable Robot Wire Twist Tensile Tester*

Granted Patent

7. 10-2802505-00-00(Registration), 10-2022-0111429(Application), *Wire Twist Tensile Tester*
8. 10-2717294-00-00(Registration), 10-2022-0177151(Application), *Wafer Transfer Robot for Semiconductor Manufacturing*
9. 10-2004-0081727 (10-0648917), Bottom-mounted underwater ultrasonic inspection device utilizing multiple sound sources and Chirp signals

PROFESSIONAL SERVICES & ASSOCIATION ACTIVITIES

- Industrial Technology R&D Planning Committee Member (MOTIE(KEIT), 2010 ~)
- International Joint R&D Planning Committee Member (MOTIE(KIaT), 2010 ~)
- Civil-Military Cooperation Planning Committee Member (Civil-Military Cooperation Promotion Institute, 2010 ~)
- Preliminary Feasibility Planning Committee Member (Ministry of Science and ICT(IITP), 2010 ~)
- Member of the Control Robotics Systems Society, General Council Member & Lifetime Member (2004 ~)
- Korean Society of Mechanical Engineers, Lifetime Member (2004 ~)
- Korean Society for Precision Engineering, Lifetime Member (2004 ~)
- Korean Robotics Society, Council Member & Lifetime Member (2014 ~)
- Korean Society of Automotive Engineers, Chairman of the Mobility Systems Research Committee (2017 ~ 2019), Lifetime Member (2017 ~)

AWARD

- Korea Robot Industry **Grand Prize, Prime Minister's Commendation**, Oct. 2020
- For Meritorious Service in the Defense Science Promotion Implementation Plan, Commendation from the Director of the DAPA (Defense Acquisition Program Administration), Aug. 2008
- For Meritorious Service in the Defense Science Promotion Implementation Plan, Commendation Commendation from the Director of the DTaQ (Defense Agency for Technology & Quality), Oct. 2009
- For Meritorious Service in the Development of the Defense Industry, Commendation from the Governor of Chungcheongnam-do, Dec. 2023

TEACHING EXPERIENCE

- ***Thesis for Degree: Rahul Ranjan****,* "A study on Integrated Algorithm using Ultra-Wideband (UWB) for enhancing positioning accuracy of Mobile Robots in Indoor Environment" M.S. Thesis, Computer Science and Electronics Engineering, Summon University, February 2024**, Supervisor: Prof. Joongeup Kye**
- *Defense Industry Specialist Training Program (Defense Acquisition, R&D, Test and Evaluation Program)*, DAPA (Defense Acquisition Program Administration), Seoul, South Korea (Mar. 2011. ~ Dec. 2015)
- *Mechatronics, Robotics & Control Systems*, Dongmyung University, Busan, South Korea (Mar. 2003. ~ Dec. 2004)
- *Mechanical Engineering*, Kyungnam College of Science and Technology, South Korea (Mar. 2001. ~ Aug. 2003)
- *Mechanical Engineering*, Busan Institute of Science and Technology, South Korea (Mar. 2001. ~ Aug. 2003)
- *Technology Planning(R&D) Program*, Sogang University, Seoul, South Korea (Feb. 2020. ~ Jan. 2021)
- *Robotics, Mechatronics*, Sunmoon University, Chungnam Province, South Korea (Jan. 2021. ~ Aug. 2024)