PROMOTION RECOMMENDATION
The University of Michigan-Dearborn
College of Engineering and Computer Science

Jaerock Kwon, assistant professor of electrical and computer engineering, Department of Electrical and Computer Engineering, College of Engineering and Computer Science, is recommended for promotion to associate professor of electrical and computer engineering, with tenure, Department of Electrical and Computer Engineering, College of Engineering and Computer Science.

Academic Degrees:

Ph.D.	2009	Computer Science and Engineering, Texas A&M University, College Station, TX
M.S.	1994	Electronic Communication Engineering, Hanyang University, Seoul, South Korea
B.S.	1992	Department of Electronic Communication Engineering, Hanyang University, Seoul, South Korea

Professional Record:

2020-present	Assistant Professor, University of Michigan-Dearborn, Dearborn, MI
2016-2019	Associate Professor (tenured), Kettering University, Flint, MI
2010-2016	Assistant Professor, Kettering University, Flint, MI
2009-2010	Visiting Assistant Professor, Kettering University, Flint, MI
2002-2004	Senior Software Engineer, Qualcomm, Inc, Seoul, South Korea
2000-2002	Senior Software Engineer, SK Teletech, Seoul, South Korea
1994-1999	Research Engineer, LG Electronics, Seoul, South Korea

Summary of Evaluation:

Teaching: Professor Kwon is rated as significantly capable in teaching. Professor Kwon has taught four distinct courses in electrical and computer engineering (ECE) and robotics engineering: ECE-3641 Robotic Manipulation, ECE-4641 Mobile Robots, ECE-5831 Pattern Recognition and Neural Networks; and ECE-505 Introduction to Embedded Systems. Notably, he completely revamped ECE-5831 to incorporate the latest trends in deep learning, achieving an impressive course evaluation score of 4.59 out of 5.0. In ECE-3641 and ECE-4641, Professor Kwon spearheaded an overhaul of the Bachelor of Science in engineering in robotics engineering courses and curriculum. Specifically, ECE-3641 underwent significant updates to integrate advanced robotics technologies and tools, including new lab materials, the Robot Operating System, Python, Linux, and comprehensive final project components. In addition to his teaching contributions, Professor Kwon is currently advising three Ph.D. students and one D.Eng. student.

Research: Professor Kwon is rated as excellent in research. Professor Kwon's research primarily focuses on bio-inspired perception and control systems based on embodied artificial intelligence (AI) in mobile robots and autonomous vehicles. Professor Kwon has demonstrated exceptional success in securing research funding and producing scholarly work at UM-Dearborn. He has obtained 11 externally funded grants and contracts totaling over $2,255,338, with his

share amounting to more than $748,729. Notably, he served as the principal investigator for six of these projects. His scholarly output includes 11 journal papers published during his tenure as an assistant professor at UM-Dearborn, averaging 2.2 publications per year.

Recent and Significant Publications:

F.K. Khanzada, E. Delavari, W. Jeong, Y.S. Cho, J. Kwon, "Comparative Study on Simulated Outdoor Navigations for Agricultural Robots," *MDPI Sensors*, 2024 (SJR Q1, Impact Factor: 3.9, Cite Score: 4.1, h-index: 245).

A. Zaboli, J. Hong, J. Kwon, J. Moore, "A Survey on Cyber-Physical Security of Autonomous Vehicles Using a Context Awareness Method," *IEEE Access*, 2023 (SJR Q1, Impact Factor: 3.4, h-index: 242).

D. Kim, A. Khalil, H. Nam, J. Kwon, "OPEMI: Online Performance Evaluation Metrics Index for Deep Learning-Based Autonomous Vehicles," *IEEE Access*, 2023 (SJR Q1, Impact Factor: 3.4, h-index: 242).

J. Kwon, A. Khalil, D. Kim, H. Nam, "Incremental End-to-End Learning for Lateral Control in Autonomous Driving," *IEEE Access*, 2022 (SJR Q1, Impact Factor: 3.4, h-index: 242)

A. Khalil, A. Abdelhamed, G. Tewolde, J. Kwon, "Ridon Vehicle: Drive-by-Wire System for Scaled Vehicle Platform and Its Application on Behavior Cloning," *MDPI Energies*, Special Issue "Autonomous Vehicles Perception and Control," 2021 (SJR Q1, Impact Factor: 3.2, Citescore: 5.5, h-index: 152).

J. Kwon, J. Lee, Y. Lee, "Comparative Study of Markerless Vision-based Gait Analyses for Person Re-identification," *MDPI Sensors*, 2021 (SJR Q1, Impact Factor: 3.9, Cite Score: 4.1, h-index: 245).

Service: Professor Kwon is rated as excellent in service. Professor Kwon served as a member of various committees, including three at the university level, one at the college level, and four at the department level. He also served as the president of the Korean Computer Scientists and Engineers Association in America in 2020 and 2021.

External Reviewers:

Reviewer A: "Professor Kwon's development of ANEC directly addresses critical safety issues in vision-based autonomous driving systems. By mitigating latency issues, ANEC paves the way for safer, more responsive autonomous vehicles—a significant contribution to this emerging field."

Reviewer B: "One of the most remarkable aspects of Professor Kwon's records is his strong passion and dedication to high-quality research, resulting in significant contributions to the neuroscience and neuroanatomy and AI research community in autonomous vehicles and mobile robotics."

Reviewer C: "Professor Kwon's recent paper, 'Comparative Study on Simulated Outdoor Navigations for Agricultural Robots,' published in MDPI Sensors, provides a comprehensive analysis of SLAM algorithms and Deep Neural Network (DNN)-based Behavior Cloning (BC) navigation tailored for outdoor agricultural environments. This research is particularly significant as it offers detailed evaluation criteria for selecting optimal navigation techniques for agricultural settings, tested across various scenarios including Precision, Speed, and Autonomy.

The insights from this study have the potential to significantly advance the field of agricultural robotics and lead to more efficient and autonomous agricultural operations."

Reviewer D: "His research offers a wealth of exciting projects that greatly enhance undergraduate and graduate teaching. The new courses he has developed, along with his numerous engaging and recruitment-focused activities, are truly impressive and inspire a vibrant learning environment for students."
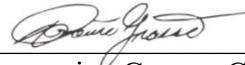
Reviewer E: "Dr. Jaerock Kwon's scholarly activities exhibit a high level of productivity, innovation, and impact. His research not only advances the field of embodied AI but also contributes to the broader areas of computational neuroscience and robotics. Given his contributions, successful mentoring, and ability to secure substantial research funding, Dr. Kwon is well-qualified for promotion to Associate Professor with tenure. I believe his continued work promises to yield further advancements in intelligent systems and AI, positioning him as a leading figure in his field."

Summary of Recommendation: Professor Kwon has distinguished himself in the field of bio-inspired perception and control systems, with his research efforts supported by the National Science Foundation. Additionally, he has made significant contributions to curriculum development within his department. With the strong support of the College of Engineering and Computer Science Executive Committee, we are pleased to recommend Jaerock Kwon for promotion to associate professor of electrical and computer engineering, with tenure, Department of Electrical and Computer Engineering, College of Engineering and Computer Science.

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Ghassan Kridli, Dean   Domenico Grasso, Chancellor
College of Engineering and Computer Science   University of Michigan-Dearborn

May 2025