Approved by the Regents
May 18, 2023

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Electrical Engineering and Computer Science

Honglak Lee, associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:

Ph.D.	2010	Stanford University, Computer Science, Stanford, CA
M.S.	2006	Stanford University, Computer Science, Stanford, CA
M.S.	2006	Stanford University, Applied Physics, Stanford, CA
B.S.	2003	Seoul National University, Physics and Computer Science, Seoul, South Korea

Professional Record:

2020 – present	Chief Scientist of AI and Senior VP, Advanced AI Research Center, LG AI Research, Seoul, South Korea
2016 – present	Associate Professor (with tenure), Department of Electrical Engineering and Computer Science, University of Michigan
2016 – 2020	Research Scientist, Google Research Brain Team, Google, Mountain View, CA
2010 – 2016	Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan

Summary of Evaluation:
Teaching: Professor Lee's post-tenure teaching consists of two large classes: EECS 498/598 (Deep Learning) in W19 and EECS 545 (Machine Learning) in W20-22. Deep Learning was a special topics course developed by the candidate, focusing on the foundations of deep neural nets, together with hands-on implementations and open-ended research projects. The course had 210 students enrolled. For Machine Learning, the candidate significantly updated the course materials to cover recent breakthroughs and innovative new topics such as deep learning, generative models and reinforcement learning, and introduced an open-ended research project, with significant guidance and feedback to students. The candidate had teaching scores of 4.47/4.67 (course/instructor quality) for EECS 498/598 and (4.27/4.47) for EECS 545 in W21 and (3.95/4.43) in W22. Professor Lee has a strong placement record and has graduated nine Ph.D. students (with seven more being currently supervised) and advised three post-doctoral fellows and over 50 masters and undergraduate students.

Research: Professor Lee's research is in the field of Deep Learning and its application to Computer Vision and more recently Reinforcement Learning. He is widely considered as a leader and pioneer in applications of deep learning, and his work has had outstanding academic and industrial impact. He has co-authored over 140 publications with over 110 publications in

top-tier venues; according to Google Scholar his publications have over 49,000 citations for an h-index of 88, with eleven of his papers having over 1000 citations each. Post-tenure, the candidate has done pioneering work in the area of generating images from text, and he has also made major contributions to a new area that combines Deep Learning and Reinforcement Learning to build fully autonomous AI agents. His paper "Value Prediction Network" (NeurIPS'17) led directly to a follow up paper by DeepMind on the state-of-the-art MuZero algorithm. Professor Lee has an outstanding record of tech transfer. He established a LG AI Research Center in Ann Arbor, leading research efforts on tackling machine learning problems with industrial significance, with potential for massive and global impact. He received an NSF CAREER Award, Sloan Research Fellowship, a Google Faculty Research Award, and was inducted into the Korean Academy of Sciences in 2022.

Recent and Significant Publications:

J. Oh, S. Singh, H. Lee, "Value Prediction Network," *31st Conference on Neural Information Processing Systems*, (NeurIPS), 2017.

S. Sohn, H. Woo, J. Choi, H. Lee, "Meta Reinforcement Learning with Autonomous Inference of Subtask Dependencies," *ICLR*, 2020.

J. Oh, Y. Guo, S. Singh, H. Lee, "Self-Imitation Learning," *ICML*, 2018.

R. Villegas, J. Yang, Y. Zou, S. Sohn, X. Lin, H. Lee, "Learning to Generate Long-term Future via Hierarchical Prediction," *ICML*, 2017.

S. Reed, Z. Akata, X. Yan, L. Logeswaran, B. Schiele, H. Lee, "Generative Adversarial Text to Image Synthesis," *ICML*, 2016.

Service: Professor Lee served for six years on the Ph.D. admissions committee, and more recently on the faculty search hosting committee. He went above and beyond expectations by writing a machine learning program to predict yield of Ph.D. applicants and devised an algorithm that was recently adopted for allocating fellowship slots among CSE faculty. He organized workshops for CSE Ph.D. students applying for the NSF graduate fellowship and identifies applicants meeting Rackham Merit Fellowship criteria. Professor Lee has also shown outstanding leadership and service in his role as the chief scientist and senior vice president at LG AI Research by initiating new research collaborations between UM and LG. His service to the machine learning and computer vision communities has been remarkable; serving as an area chair or senior area chair for 31 top tier conferences, including NeurIPS (8), ICML (8), ICLR (6), and five computer vision conferences. He has also co-organized nine workshops, tutorials, or symposia at major conferences, was the Workshops co-chair at ICML, and the associate program chair at IJCAI 2020 where he oversaw the reviews of all machine learning submissions. He currently serves or has served on the editorial boards of three major journals.

External Reviewers:

Reviewer A: "…Honglak is one of the best faculty members in machine learning in the same age group. He has a great and successful research agenda, with impactful contributions both in machine learning and computer vision. I think he largely meets all requirements for promotion at a major research university like the University of Michigan."

Reviewer B: "I have been following Honglak Lee's work since he was a PhD candidate at Stanford, when he became one of the key contributors in the area of deep learning, which is my

main area of research since this area's inception in 2005-2006. Since those beginnings, his scientific contributions have been steady and remarkable, yielding one of the highest Google h-index (76) among computer science professors.... In my view, Honglak Lee clearly meets the requirements for promotion to a tenured Professor position at any of the major research universities."

Reviewer C: "Honglak is without any doubt one of the brightest and most respected researchers in the field of deep learning. Most of the tremendous impact of this field is in fact attributable to Honglak's pioneering work on unsupervised learning. Over the years Honglak has consistently made very significant contributions to this field, demonstrating that he is a unique innovator and leader."

Reviewer D: "His work spans diverse areas including deep representation learning, robotics, computer vision, reinforcement learning, etc, and he has impressively made substantial contributions in all of them. He is clearly a major figure in the AI field, even when broadly defined."

Reviewer E: "One would have a hard time to overstate Honglak's impact on the field of deep learning. With a body of work that has gathered over 45,000 citations and an h-index of 75, he is undeniably amongst the top research figures of our field."

Summary of Recommendation: Professor Lee has established a high-impact record of teaching, scholarly research, and service at the University of Michigan. It is with the support of the College of Engineering Executive Committee that I recommend Honglak Lee for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Alec D. Gallimore, Ph.D.
Robert J. Vlasic Dean of Engineering
College of Engineering

May 2023