

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

Hun Seok Kim, assistant professor of electrical engineering and computer science, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:

Ph.D.	2010	University of California, Electrical Engineering, Los Angeles, CA
M.S.	2006	University of California, Electrical Engineering, Los Angeles, CA
B.S.	2001	Seoul National University, Electrical Engineering, Seoul, South Korea

Professional Record:

2016 – present	Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan
2014 – 2016	Assistant Research Scientist, Department of Electrical Engineering and Computer Science, University of Michigan
2010 – 2014	System Engineer, EP R&D Labs, Texas Instruments, Dallas, TX

Summary of Evaluation:

Teaching: Professor Kim has contributed significantly to the undergraduate and graduate education programs at the University of Michigan. He has taught three courses since joining the University of Michigan: EECS 312, EECS 452, and EECS 598, a special topics course on VLSI in communications and machine learning. Professor Kim's average scores are 4.08/4.48 (EECS 312, Q1/Q2), 4.45/4.6 (EECS 452, Q1/2), 4.7/4.75 (EECS 598, Q1/Q2). He revised the EECS 452 labs to enable remote learning during the pandemic and developed EECS 598 from scratch, attracting approximately 30 students: healthy for a graduate-level special topics course.

Professor Kim is supervising eight Ph.D. students with two expected to graduate this year. He has graduated four Ph.D. students as a co-chair with another three in progress. In addition, he is a member on several other Ph.D. committees. He has advised 18 master's students and advised eight undergraduate students.

Research: Professor Kim's contributions are primarily in the areas of algorithms for machine learning, signal processing, and wireless communication and are motivated by the desire to solve complex interdisciplinary engineering and design problems enabling new distributed, wireless sensing and communication systems. His work considers the system-level implications of his design decisions. He typically designs algorithms in the context of the complex (application, algorithm, software, architecture, and circuit) systems they will be used within, enabling him to develop novel ideas that work in real systems. The systems he considers are frequently subject to tight power consumption, volume, timing, and other constraints. Several of his ideas have been implemented in custom integrated circuits. His consequential consideration of the full-system implications of his design decisions are noted by external reviewers. Many of Professor

Kim's high-impact publications are from large-scale team projects with numerous student and faculty collaborators. These full-system projects have received widespread attention. Professor Kim's funding record is exceptionally strong and more than adequate to support a large group of graduate research assistants. He has 13 active research grants, his share of which is \$5 million, and he is PI on grants for which his share is \$2.5 million.

Recent and Significant Publications:

Bowen Liu, Yu Chen, Shiyu Liu, Hun-Seok Kim, "Deep Learning in Latent Space for Video Prediction and Compression," *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.

Yu Chen, Bowen Liu, Pierre Abillama, Hun-Seok Kim, "HTNN: Deep Learning in Heterogeneous Transform Domains with Sparse-Orthogonal Weights," *ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED)*, 2021.

Hyochan An, Siddharth Venkatesan, Sam Schiferl, Tim Wesley, Qirui Zhang, Jingcheng Wang, Kyojin Choo, Shiyu Liu, Bowen Liu, Ziyun Li, Hengfei Zhong, Luyao Gong, David Blaauw, Ronald Dreslinski, Dennis Sylvester, Hun-Seok Kim, "A 170uW Image Signal Processor Enabling Hierarchical Image Recognition for Intelligence at the Edge," *IEEE Symposium on VLSI Circuits (VLSI-Symposium)*, 2020.

Yajing Chen, Nicholas Chiotellis, Li-Xuan Chuo, Carl Pfeiffer, Yao Shi, Ronald Dreslinski, Anthony Grbic, Trevor Mudge, David Wentzloff, David Blaauw, Hun Seok Kim, "Energy-Autonomous Wireless Communication for Millimeter-Scale Internet of Things Sensor Nodes," *IEEE Journal on Selected Areas in Communications*, 2016.

Li-Xuan Chuo, Zhihong Luo, Dennis Sylvester, David Blaauw, Hun-Seok Kim, "RF-Echo: A Non-Line-of-Sight Indoor Localization System Using a Low-Power Active RF Reflector ASIC Tag," *23rd Annual International Conference on Mobile Computing and Networking (Mobicom)*, 2017.

Service: Professor Kim has contributed significantly to service and outreach including his role as a computer engineering undergraduate advisor for five years, a graduate advisor, and summarizing admissions for the VLSI area. Professionally, he is on the editorial board of three IEEE transactions (*Mobile computing*, *Solid State Circuits Letters*, and *Green Communications and Networking*) and on the technical program committees for Mobicom, MobiSys, and ISLPED conferences, some of the leading conferences in his field (Mobicom and MobiSys are highly selective and generally regarded as journal equivalent).

Professor Kim's most innovative service work, and most relevant to diversity, inclusiveness, and equity, has been in two novel and exciting outreach projects. He collaborated with faculty in the School of Art and Design and the School of Information to create a projection-based augmented reality (AR) system called iGYM that allows people with disabilities to augment their experiences in both social and physical play. He enlisted 12 children with disabilities and their families to participate in two pilot runs. With his second highly innovative outreach activity, he and his collaborators have enlisted the aid of 300 K-12 students to collect data to plot the 3000 km long migration pattern of endangered monarch butterflies. He was responsible for an ultra-small and light butterfly-mounted wireless sensing and computing platform.

External Reviewers:

Reviewer A: “The research team University of Michigan has put together in...wireless and embedded systems is incredibly productive and it is great to see Hun-Seok become a key component to Michigan’s success...tenure is a no-brainer. If Michigan doesn’t, I suspect many top institutions, including mine, would be happy to have him as a tenured faculty.”

Reviewer B: “I don’t have a shred of a doubt of his ability to do solid independent research and I think he has struck the right balance in favor of maximizing the impact of his work.”

Reviewer C: “He should be comfortably included in the top 10 among all the assistant and associate professors who were recently promoted in the world.”

Reviewer D: “This fully characterizes his main strength: working across application domains, not being afraid of the complexity this brings.”

Reviewer E: “The breadth of his research endeavors and the depth of insights from his papers are highly commendable. I support his promotion to Associate Professor with Tenure.”

Summary of Recommendation: Professor Kim is an internationally renowned researcher whose work has had significant impact in the areas of digital VLSI circuits. He has an excellent record in teaching, mentorship, and service. It is with the support of the College of Engineering Executive Committee that I recommend Hun Seok Kim for promotion to associate 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. Vlastic Dean of Engineering
College of Engineering

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