

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

Robert Dick, 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. 2002 Princeton University, Electrical and Computer Engineering, Princeton, NJ
B.S. 1994 Clarkson University, Computer Engineering/Electrical Engineering, Potsdam, NY

Professional Record:

2011 – present Associate Professor (with tenure), Department of Electrical Engineering and Computer Science, University of Michigan
2009 – 2011 Associate Professor, Department of Electrical Engineering and Computer Science, University of Michigan
2008 Associate Professor, Department of Electrical Engineering and Computer Science, Northwestern University, Evanston, IL
2003 – 2008 Assistant Professor, Department of Electrical Engineering, Northwestern University, Evanston, IL

Summary of Evaluation:

Teaching: Professor Dick is an outstanding teacher and educator, having taught a wide range of courses at all levels. His willingness and desire to teach a variety of courses help provide the much-needed coverage the ECE division needs to support its large academic program, and he is one of the primary faculty covering computer engineering courses. Professor Dick was a major contributor to ECE's ENGR100 course on autonomous systems (as a co-creator), and he solely developed EECS 507, a course on embedded systems research. He is a dedicated mentor, caring deeply about the academic growth of each student and many students benefited from his personal attention. He has graduated 12 Ph.D. students (two co-advised), with five more currently being advised. He has also supervised masters and undergraduate students. Professor Dick has been very effective in recruiting, retaining, and mentoring underrepresented students; half of his graduate advisees have been from underrepresented groups.

Research: Professor Dick's research contributes to the design automation for embedded systems, and in particular the power, reliability and thermal optimizations, and the efficient memory usage. Professor Dick's most influential work is his research on power modeling and optimization for smartphones. His approach to automatic generation of power models for embedded systems is a significant achievement and a contribution to the practice. His work in this area initiated a new research direction and had a significant impact on the application development practice. Professor Dick is a recognized leader in the power and thermal aware

design of embedded systems. He has also been successful in his entrepreneurial pursuits and technology transfer. He formed Stryd, a startup company, to develop wearable power meters and served as the founding CEO.

Recent and Significant Publications:

- L. Zhang, T. Birjodh, Z. Qian, Z. Wang, R. P. Dick, Z. M. Mao, and L. Yang, "Accurate online power estimation and automatic battery behavior based power model generation for smartphones," in *IEEE/ACM/IFIP International Conference on Hardware/Software Codesign and System Synthesis*, pp. 105-114, 2010.
- L. S. Bai, R. P. Dick, and P. A. Dinda, "Archetype-based design: Sensor network programming for application experts, not just programming experts," in *International Conference on Information Processing in Sensor Networks*, pp. 85-96, 2009.
- Y. Liu, D. R. Bild, R. P. Dick, Z. M. Mao, and D. S. Wallach, "The Mason test: A defense against Sybil attacks in wireless networks without trusted authorities," *IEEE Transactions on Mobile Computing*, vol. 14, no. 11, pp. 2376-2391, 2015.
- E. S. Lubana and R. P. Dick, "Digital Foveation: An energy-aware machine vision framework," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 37, no. 11, pp. 2371-2380, 2018.
- R. P. Dick, S. Li, M. Wolf, and S.-W. Yang, "Embedded intelligence in the internet-of-things," *IEEE Design & Test*, vo. 37, no. 1, pp. 7-27, 2019.

Service: Professor Dick created the Embedded Systems Area in ECE and provided sustained leadership. He has been solely responsible for advising the area's students and managing the curriculum. He also led the area's faculty hiring in 2020. He has been a long-time member of the Computer Engineering (CE) Program Committee and served as the chair for many years and as the CE chief program advisor once. In 2023, he served the major role of the Computer Engineering ABET coordinator. In 2018-2019, he chaired the College of Engineering Math Curriculum Revision Committee to develop recommendations for revising the math curriculum to better serve students' needs. Professor Dick was elected and served on the ECE Executive Committee in 2020-2021. Externally, Professor Dick contributed to embedded systems conferences, serving as TPC chair, sub-committee chair and reviewer. In addition, he was an associate editor for the *IEEE Transactions on VLSI Systems*.

External Reviewers:

Reviewer A: "Dr. Dick has established himself as a respected researcher in the area of embedded computing across the entire hardware/software abstraction stack."

Reviewer B: "In short, Prof. Dick has made several seminal contributions to the embedded field throughout his career that have had a large impact not only academically but also commercially."

Reviewer C: "Professor Dick is an outstanding researcher in the field of embedded system design, particularly renowned as a global leader in thermal and energy-aware embedded system design."

Reviewer D: “Robert has made contributions to multiple disciplines in the embedded and real time systems community. He has consistently published papers in premier conferences and journals in his field.”

Reviewer E: “Prof. Dick has clearly established himself as an expert in embedded systems with an emphasis on applying low-power techniques for machine learning assisted signal processing applications.”

Summary of Recommendation: Professor Dick has demonstrated excellence in research, teaching and performed valuable service both internally and externally. It is with the support of the College of Engineering Executive Committee that I recommend Robert Dick for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.



Steven L. Ceccio, Ph.D.
Interim Dean of Engineering
Vincent T. and Gloria M. Gorguze Professor
of Engineering
College of Engineering

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