PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Approved by the Regents
May 20, 2010

Dennis M. Sylvester, 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.	1999	University of California, Electrical Engineering, Berkeley, CA
M.S.	1997	University of California, Electrical Engineering, Berkeley, CA
B.S.	1995	University of Michigan, Electrical Engineering, Ann Arbor, MI

Professional Record:

2006-2007	Visiting Associate Professor, Department of Electrical and Computer Engineering, National University of Singapore
2005-present	Associate Professor (with tenure), Department of Electrical Engineering and Computer Science, University of Michigan
2000-2005	Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan
1999-2000	Senior R&D Engineer, Synopsys, Inc., Mountain View, CA
1996-1998	TCAD Engineer, Hewlett-Packard Laboratories, Palo Alto, CA

Summary of Evaluation:

Teaching: Professor Sylvester has established an excellent teaching record at Michigan. His contributions are significant both in and out of the classroom. He has developed (jointly with Professor David Blaauw) and taught a new graduate-level course on "Advanced High-Performance VLSI Design" (EECS 628). He has been regularly teaching the senior-level elective on VLSI Design (EECS 427) and the core graduate-level courses on VLSI Design (EECS 627) and integrated circuits (EECS 523). His Q1/Q2 scores have been consistently above 4.0, a notable accomplishment for such demanding courses.

Beyond his excellent teaching contributions in the classroom, Professor Sylvester has distinguished himself as a very successful supervisor of graduate students. He has graduated a total of 12 Ph.D. students. Since his most recent promotion in 2005, he has chaired seven and co-chaired two Ph.D. committees. His Ph.D. graduates have moved on to attain positions at leading industry labs, including IBM and Intel. Professor Sylvester is currently advising a group of 13 graduate students. In addition to directing his students with great success, Professor Sylvester stands out as a mentor who guides and inspires undergraduate and graduate students alike. Professor Sylvester's contributions to teaching have been recognized by the CoE Vulcans Education Excellence Award, the CoE 1938E Award and the Henry Russel Award.

Research: Professor Sylvester's research-related activities and their impact are monumental in scope. He is a nationally and internationally renowned researcher in the field of low power circuits. A defining feature of his research is his ability to identify the most relevant and challenging problems and to be one of the first to tackle and solve them. As an example, he has extended his research on ultra-low power subthreshold circuits to low-power microprocessors/microcontrollers and energy efficient CMOS image sensors. His work in these areas has found applications in environmental monitoring and radio frequency identification (RFID). Some of his solutions for low-power consumption in ICs have been adopted by

industry world-wide. In addition, he is co-founder of a company invested in the development of ultra-low power microelectronics platforms for defense and industry.

Professor Sylvester has presented numerous invited and keynote talks, and has written several invited articles in journals and trade magazines, including four invited articles in the prestigious *Proceedings of the IEEE*. The quantity and quality of his research is reflected in his h-index of 34, a rare achievement for anyone in any field of science and engineering at this career stage.

A hallmark of Professor Sylvester's work is his collaboration with colleagues in the department, at other universities, and in the industry. He has secured a sizeable amount of funding from industrial and government sources. He has 250 archival articles and conference presentations and proceedings to his credit. Professor Sylvester's contributions to research have been recognized by the NSF CAREER Award, the IBM Faculty Award, the Outstanding New Faculty Award by ACM and the Inventor Recognition Award by the Semiconductor Research Corporation. In addition, he and his students have garnered eight best paper awards.

Recent and Significant Publications

Scott Hanson and Dennis Sylvester, "A 0.45-0.7V Sub Microwatt CMOS Image Sensor for Ultra-Low Power Applications," *IEEE Symposium on VLSI Circuits Digest of Technical Papers*, pp. 176-177, 2009.

Scott Hanson, ZhiYoong Foo, Daeyeon Kim, Yoonmyung Lee, Nurrahman Liu, Dennis Sylvester and David Blaauw, "A Low-Voltage Processor for Sensing Applications with Picowatt Standby Mode," *IEEE Journal of Solid-State Circuits*, 44, 1145-1155, April 2009.

E. Karl, P. Singh, D. Blaauw, and D. Sylvester, "Compact In-Situ Sensors for Monitoring Negative-Bias-Temperature-Instability Effect and Oxide Degradation," *IEEE International Solid State Circuits Conference*, pp. 410-411, 2008.

Scott Hanson, Bo Zhai, Mingoo Seok, Brian Cline, Kevin Zhou, Meghna Singhal, Michael Minuth, Javin Olson, Leyla Nazhandali, Todd Austin, Dennis Sylvester, and David Blaauw, "Exploring Variability and Performance in a Sub-200-mV Processor," *IEEE Journal of Solid-State Circuits*, Vol. 43, No. 4, April 2008, pp. 881-891.

Sarvesh H. Kulkarni, Dennis M. Sylvester and David T. Blaauw, "Design-Time Optimization of Post-Silicon Tuned Circuits Using Adaptive Body Bias," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, Vol. 27, No. 3, March 2008, pp. 481-494.

D. Sylvester and A. Srivastave, "Computer-Aided Design for Low-Power Robust Computing in Nanoscale CMOS," (INVITED), *Proceedings of the IEEE*, pp. 507-529, March 2007.

Service: Professor Sylvester has compiled an excellent record in professional service for a faculty member at his rank. This record includes both internal service activities contributing to the mission of the EECS department and college, and external service that has made notable contributions to the electrical engineering profession. His internal activities include serving on a number of departmental committees involving faculty recruitment, strategic planning, building renovation, curriculum development, and promotion and tenure. He was also the ECE representative for the CSE chair search committee in 2007-2008. Professor Sylvester has also served on the committees of more than 50 Ph.D. students during his time at Michigan. His primary external service activities include positions as associate editor or co-guest editor for several leading electrical engineering journals, as organizer or member of the technical committee for many conferences and workshops, and reviewer for journals and funding programs.

Professor Sylvester is also committed to contributing to diversity and climate at Michigan. He is mindful of the diverse cultural backgrounds, perspectives, and influences of his students and strives to interact

with them in a balanced and positive manner. He has made particular efforts to encourage women to continue graduate studies in electrical engineering.

External Reviewers:
Reviewer A: "In my assessment, University of Michigan is now in the top five (in the world) in the field of low power digital circuit design. This is largely because of the top notch research team, working closely, innovating, and solving the important problems. And, I believe that Dennis's [sic] research has played a key role in establishing this. That is why I believe that Dennis is not only a leading researcher in the field of low power circuits, but among the **top ten in the world**."

Reviewer B: "Dennis Sylvester has made significant contributions to integrated circuit design and design methods. He is considered a leader in these fields, for his breadth of knowledge and for the importance of the specific technical achievements. His work has had significant impact on the academic and industrial communities worldwide."

Reviewer C: "Professor Sylvester's work, as exhibited by his publication record and honors, also places him in the top rank of faculty in his field."

Reviewer D: "Dennis' work focuses on issues that are important for silicon technologies at the end of roadmap. In particular, he has done pioneering work in the area of leakage estimation under process variations, modeling of process parameter variations, design of scaled CMOS circuits under extreme parameter variations, and design of ultra low power CMOS circuits."

Reviewer E: "You need to be seen as a 'serious circuits person' to be invited to venues like ISSCC, and this again speaks well of Dennis's [sic] reputation."

Reviewer F: "His work on low power design has made him an acknowledged authority on the subject."

Summary of Recommendation: Professor Dennis Sylvester is an internationally recognized leader in low power circuits. He has established a vigorous and productive research effort at Michigan. He has made important contributions to both undergraduate and graduate education, and to both internal and external service. It is with the support of the College of Engineering Executive Committee that I recommend Dennis M. Sylvester for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

David C. Munson Jr.

David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

May 2010