

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Scott Mahlke, 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.	1997	University of Illinois, Urbana-Champaign, Electrical Computer and Engineering
M.S.	1991	University of Illinois, Urbana-Champaign, Electrical and Computer Engineering
B.S.	1988	University of Illinois, Urbana-Champaign, Computer Engineering

Professional Record:

2006 – present	Associate Professor, Electrical Engineering and Computer Science, University of Michigan
2001 – 2006	Assistant Professor, Electrical Engineering and Computer Science, University of Michigan
2008 – present	Co-founder, Parakinetics Inc.
1995 – 2001	Research Scientist, Compiler and Architecture Research Group, HP Labs
1988 – 1995	Research Assistant, ECE Department, University of Illinois, Urbana-Champaign
1992 – 1993	Consultant, Hewlett-Packard Laboratories, summer
1992	Research Engineer, Intel Corporation, summer
1988	Hardware Engineer, IBM Corporation, summer

Summary of Evaluation

Teaching: Professor Mahlke has established an outstanding record in all aspects of teaching including classroom instruction, curriculum development, and student mentorship. He has taught courses at all levels of the program, from a required large undergraduate introductory course on computer organization (EECS 370), to a senior-level course on compiler construction (EECS 483) to an advanced graduate course on compilers (EECS 583). Since achieving tenure in 2006, his teaching scores have been consistently strong with his Q1 and Q2 scores averaging 4.55 and 4.77, respectively. His contributions to the curriculum have had a significant impact on the Computer Science and Engineering (CSE) program, particularly in the overlapping areas of compiler design and computer architecture. He implemented a major revision to EECS 483 (Compiler Construction), and in doing so changed the focus of the class from front-end compiler design to back-end compiler design by including topics such as control and data flow analysis and optimization. Professor Mahlke's course on Advanced Compilers (EECS 583) has become a core offering in the computer engineering curriculum, with strong enrollment every year. He has graduated nine doctoral students and is currently mentoring more than ten Ph.D. students.

Research: Professor Mahlke is one of the leading researchers of his generation in the areas of compilers and computer architecture. Professor Mahlke is considered one of the pioneers in recognizing the potential for synergy at the boundary of hardware and software. He has made seminal contributions in three related areas: hardware customization, application-specific processors, and energy-efficient robust computing. Professor Mahlke has amassed an impressive record of publication in prestigious IEEE and ACM archival journals and highly competitive flagship conferences in his areas of specialization. Since joining the faculty of the University of Michigan, he and his students have been recognized with two

IEEE Micro “Top Picks” recognition in computer architecture in 2006 and 2009, and eight “best paper” awards at major conferences. He was also a co-recipient of the College of Engineering Ted Kennedy Family Team Excellence Award in 2009. He is the inventor or co-inventor of seven patents. The impact and relevance of Professor Mahlke’s research is further evidenced by his industry collaborations with leading semiconductor and computer companies including ARM, IBM, Intel, HP and Nvidia. Professor Mahlke has been highly successful in attracting external support for his research including significant support from highly competitive NSF and DARPA programs and industry sponsors. The external letters from prominent researchers in the field are unanimous in their assessment of the quality and impact of his work.

Recent and Significant Publications

- M. Woh, S. Seo, S. Mahlke, T. Mudge, C. Chakrabarti, and K. Flautner, 2009 IEEE Micro Top Picks in Computer Architecture Selection, “AnySP: Anytime anywhere anyway signal processing,” *36th Int’l. Symposium on Computer Arch.* 2009.
- S. Gupta, A. Ansari, S. Feng and S. Mahlke, Best Paper Award, “Adaptive online testing for efficient hard fault detection,” *27th Int’l. Conference on Computer Design*, 2009.
- M. Woh, Y. Lin, S. Seo, S. Mahlke, T. Mudge, C. Chakrabarti, R. Bruce, D. Kershaw, A. Reid, M. Wilder, and K. Flautner, Best Paper Award, “From SODA to scotch: The evolution of a wireless baseband processor,” *41st International Symposium on Microarchitecture*, 2008.
- M. Chu, R. Ravindran, and S. Mahlke, Best Paper Award, “Data access partitioning for fine-grain parallelism on multicore architectures,” *40th International Symposium on Microarchitecture*, 2007.
- M. Woh, S. Seo, H. Lee, Y. Lin, S. Mahlke, T. Mudge, C. Chakrabarti, and K. Flautner, Best Paper Award, “The Next Generation Challenge for Software Defined Radio,” *7th International Workshop on Systems, Architectures, Modeling, and Simulation*, 2007.
- Y. Lin, H. Lee, M. Woh, Y. Harel, S. Mahlke, T. Mudge, C. Chakrabarti, and K. Flautner, 2006 IEEE Micro Top Picks in Computer Architecture Selection, “SODA: A Low-power Architecture for Software Radio,” *33rd International Symposium on Computer Architecture*, 2006.
- S. Yehia, N. Clark, S. Mahlke, and K. Flautner, Best Paper Award, “Exploring the design space of LUT-based transparent accelerators,” *2005 International Conference on Compilers, Architecture, and Synthesis for Embedded Systems*, 2005.
- N. Clark, H. Zhong, and S. Mahlke, Outstanding paper selection, “Processor acceleration through automated instruction set customization,” *Proc. 36th International Symposium on Microarchitecture*, 2003. Paper selected to appear in October 2005 special issue of *IEEE Transactions on Computers*.
- R. A. Ravindran, R. M. Senger, E. D. Marsman, G. S. Dasika*, M. R. Guthaus, S. A. Mahlke, and R. B. Brown, Outstanding paper selection, “Increasing the number of effective registers in a low-power processor using a windowed register file,” *2003 International Conference on Compilers, Architecture, and Synthesis for Embedded Systems*, 2003. Paper selected to appear in August 2005 special issue of *IEEE Transactions on Computers*.
- P. P. Chang, S. A. Mahlke, W. Y. Chen, N. J. Warter, and W. W. Hwu, Most influential paper selection, “IMPACT: An architectural framework for multiple-instruction-issue processors.” Paper named one of the most influential computer architecture papers in first 25 years of the *International Symposium on Computer Architecture*, 1998.

Service: Professor Scott Mahlke has made significant contributions to the University and the professional community through his service. He has participated on several major committees within the EECS Department, including his service on the CE Curriculum Committee, CSE Faculty Search Committee, ECE Search Committee and as an EECS Undergraduate Advisor. He was recently appointed to serve on the CSE Chair Search Advisory Committee. Professor Mahlke has also established an exemplary record

of external service. Since achieving tenure, he has served on more than twenty -five technical program committees associated with the conferences, symposia and workshops in his areas of research. He has served in leadership positions for several top technical forums in his field, including program co-chair of the International Symposium on Microarchitecture in 2002 and 2006, and co-organizer of several highly successful workshops on parallel execution multi-core systems. He has also served on the editorial boards of the two top journals in computer architecture – *ACM Transactions on Architecture and Code Optimization*, and the *Journal of Instructional Level Parallelism*. Both internal and external letters comment positively on his service to the University and the professional community.

External Reviewers:

Reviewer A: “Dr. Mahlke’s research credentials are impeccable...The very rich range and set of his publications in top-rated conferences...demonstrates his breadth and his knack of pursuing high quality research that spans multiple disciplines.”

Reviewer B: “This steady stream of best paper awards over such a long period, in particular after his last promotion to the rank of Associate Professor, is another clear indicator of the extremely high quality of Scott’s research and his unique talent in these research fields.”

Reviewer C: “Professor Mahlke is one of the few researchers who not only deeply understands but also has done innovative research in both computer architecture and compiler technology.”

Reviewer D: “He works in a very challenging area and the unique capability he brings to it is that instead of treating each area separately, he works on problems that cut across the architecture-software boundary.”

Reviewer E: “Since tenure in 2006, Mahlke has continued to aggressively publish, attract strong funding, and produce top-flight students....”

Reviewer F: “Scott Mahlke is one of the brightest researchers in the areas of compilers and computer architecture Scott Mahlke has clearly demonstrated that he is a world-class researcher with outstanding creativity and excellent abilities to lead and perform research projects of extremely high relevance and impact.”

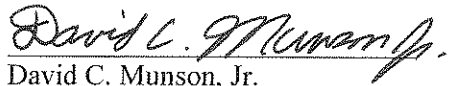
Reviewer G: “Dr. Mahlke has been very successful in obtaining research funding for his projects. He has obtained funding from highly competitive National Science Foundation and DARPA programs as well as from microprocessor manufactures [sic].”

Reviewer H: “... he has done far more than his share of service functions in behalf of the computer architecture and compiler community.”

Reviewer I: “Prof. Mahlke is an outstanding researcher. He is a true powerhouse in terms of productivity and technical contributions. He is one of the world leaders in the area of interaction of computer architecture and compilation systems....”

Summary of Recommendation: Professor Mahlke has established an exemplary record of teaching, research and service at the University of Michigan. He is one of the top computer architects of his generation. His scholarly contributions in the areas of compiler technology and computer architecture have served to strengthen the Computer Science and Computer Engineering programs at the University of Michigan. His portfolio of research includes numerous award papers in the most prestigious venues in his field of specialization. His teaching record is excellent at both the undergraduate and graduate levels, and

his students find him to be a dedicated and nurturing teacher and mentor. Through his quality service, he has made noteworthy and beneficial contributions to his profession and the institution. Without reserve, reviewers were uniform in their evaluation of the excellence and influence of Professor Mahlke's work and the assurance of its long-term scholarly impact on the field. It is with the support of the College of Engineering Executive Committee that I recommend Scott Mahlke for promotion to the professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.



David C. Munson, Jr.

Robert J. Vlasic Dean of Engineering
College of Engineering

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