PROMOTION RECOMMENDATION
The University of Michigan-Dearborn
College of Engineering and Computer Science

Bruce R. Maxim, associate professor of computer and information science, with tenure, Department of Computer and Information Science, College of Engineering and Computer Science, is recommended for promotion to professor of computer and information science, with tenure, Department of Computer and Information Science, College of Engineering and Computer Science.

Academic Degrees:

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| Ph.D. | 1982 | Mathematics Education, University of Michigan, Ann Arbor, MI |
| M.A. | 1974 | Mathematics Education, University of Michigan, Ann Arbor, MI |
| B.S.Ed. | 1973 | Mathematics Education, University of Michigan, Ann Arbor, MI |

Professional Record:

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| 2008 – 2011 | Chief Technology Officer, Sweetspot Games, Silver Springs, NV |
| 1998 – 1999 | Visiting Scholar, Electrical Engineering and Computer Science Department, University of Michigan, Ann Arbor, MI |
| 1992 – present | Associate Professor, Computer and Information Science, University of Michigan-Dearborn, Dearborn, MI |
| 1991 – 1992 | Visiting Scholar, Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI |
| 1991 – 1991 | Director, Computer and Information Science Program, University of Michigan-Dearborn, Dearborn, MI |
| 1990 – 1991 | Associate Professor, Computer & Information Science Program, University of Michigan-Dearborn, Dearborn, MI |
| 1990 – 1991 | Associate Professor, Mathematics and Statistics Department, University of Michigan-Dearborn, Dearborn, MI |
| 1986 – 1990 | Assistant Professor, Computer and Information Science Program, University of Michigan-Dearborn, Dearborn, MI |
| 1985 – 1990 | Assistant Director, Computer and Information Science Program, University of Michigan-Dearborn, Dearborn, MI |
| 1985 – 1990 | Assistant Professor, Mathematics and Statistics Department, University of Michigan-Dearborn, Dearborn, MI |
| 1984 – 1984 | Visiting Assistant Professor, Mathematics and Statistics Department, University of Michigan-Dearborn, Dearborn, MI |
| 1983 – 1984 | Adjunct Assistant Professor, Mathematics and Statistics Department, University of Michigan-Dearborn, Dearborn, MI |
| 1983 – 1984 | Senior Programmer Analyst, Post Graduate Medicine Department, University of Michigan, Ann Arbor, MI |
| 1982 – 1984 | Part-Time Instructor, Washtenaw Community College, Ann Arbor, MI |
| 1980 – 1983 | Programmer Analyst 2, Post Graduate Medicine Department, University of Michigan, Ann Arbor, MI |

| 1978 – 1980 | Programmer 2, Epidemiology Department, University of Michigan, Ann Arbor, MI |
| 1973 – 1978 | Instructor, Mathematics, Greenhills School, Ann Arbor, MI |

Summary of Evaluation:

Teaching: Professor Maxim is an excellent and very skillful educator. Over the last seven years, his average student evaluation score (weighted per number of responded students per course) is 4.77/5.0. He has taught 28 different CIS courses and has developed 20 new courses (both undergraduate and graduate) since his last promotion. His teaching interests include software engineering, human computer interaction, game design, artificial intelligence, and computer science education. He was a co-author of a series of best-selling introductory computer science texts and created web content to support the world's most popular software engineering text. Currently, he is a co-author of a new software engineering text which is considered one of the best in the field.

Professor Maxim is the architect of the ABET accredited Computer Science curriculum and the ABET accredited Software Engineering curriculum at the University of Michigan-Dearborn. He has served on the ACM and IEEE committees that created the standard curricula for both areas, and has created more than 20 courses in graduate and undergraduate programs in our department. He was designated as a UM-D service learning fellow for 2009-2010. He has supervised more than 246 community-based student software projects since his last promotion. The value of the software engineering work donated ranges from $40,000 to $80,000 per project and has created a great deal of good will in the community. Nine of these projects have won the top award from the annual CECS senior design competition, during the 16 years of its existence.

Professor Maxim began teaching game design courses at the University of Michigan-Dearborn in 1999. His students have developed a large number of multimedia computer games. Several of these games were developed as collaborative projects between his students and digital animation students from the College of Creative Studies in Detroit. His recent activities have been in the area of serious game development. Algorithm animation software created by his students in this area has been used by a large number of professors around the globe.

Research: Professor Maxim's work on serious game and virtual worlds development has occupied much of his research activity for the past 15 years, with several separately funded research efforts in this area. He has supervised 14 game-based master's projects, 23 game-based senior design projects involving more than seventy students, and 14 independent study projects on game related topics. He worked with Ben Ridgeway at the College of Creative Studies, Patricia Anderson at the University of Michigan, Nilesh Patel at Oakland University, and Margret Turton at LaTrobe University, Melbourne. He has supported three GSRA's over a period of five years, two student programmers, and two game artists as part of these projects.

Some of the games developed have focused on handwriting recognition, problems faced by homeless veterans, exploring the cultural diversity of Detroit, exploring best practices of food banking, training business executives, as well as game AI for entertainment games. Two of his game projects (a game on engineering process improvement, a game on teaching the dangers of cyber stalking) are ongoing and waiting for student development teams to complete their work.

Two of his newest game projects (the library collection management game and an environmental decision making project) are in the planning stages and have received initial funding from the MCubed program, and involve collaboration with a number of University of Michigan faculty (Mark Lindquist, Christi Merrill, Heidi Kumao, and Barbara Alvarez) and UM-Dearborn faculty (Jennifer Proctor and Francine Dolins). These projects will support several undergraduate and graduate students.

Currently, he is working with Christi Merrill, Heidi Kumao, and Barbara Alvarez from the University of Michigan on a digital humanities project whose goal is to create a computer game whose goal is to explore bias present in the University of Michigan Library Catalog System. Initial funding was obtained through the MCubed program, and the project is scheduled to be completed in fall 2017.

Since his last promotion, Professor Maxim has produced just over two publications per year (journals, conferences, chapters, books). His recent book in software engineering is one of the best in the field. It is currently being translated into many other languages.

Professor Maxim has served on 11 conference program committees since his last promotion. He has also served on three education curriculum committees/task forces since his last promotion, including two prestigious ACM/IEEE committees (ACM/IEEE Software Engineering Education Project Committee, 2002-2005 and ACM/IEEE Curriculum 2001 Review Committee, 1999-2001).

Recent and Significant Publications:

Usman Mansoor, Marouane Kessentini, Bruce R. Maxim, and Kalyanmoy Deb, "Multi-Objective Code-Smells Detection Using Good and Bad Design Examples," *Software Quality Journal*, 2016, doi:10.1007/s11219-016-9309-7.
Hanzhang Wang, Ali Ouni, Marouane Kessentini, Bruce R. Maxim, and William I. Grosky, "Identification of Web Service Refactoring Opportunities as a Multi-Objective Problem," IEEE International Conference on Web Services, July 2016, pp. 586-593.
Habib M. Ammari, Nicholas Gomes, Matthew Jacques, Bruce Maxim, and David Yoon, "Survey of Sensor Network Applications and Architectural Components," *Ad Hoc & Sensor Wireless Networks International Journal*, Vol. 25, No. 1-2, 2015, pp. 1-44.
Bruce R. Maxim and M. Turton, "Use of Teams in Game Design and Software Engineering Capstone Classes," Global Perspectives on Engineering Management, Vol. 2, No. 1, February 2013, pp. 21-26.
Akila Varadarajan, Nilesh Patel, Bruce Maxim, and William Grosky, "Analyzing the Efficacy of Using Digital Ink Devices in a Learning Environment," Multimedia Tools and Applications, Vol. 40, No. 2, November 2008, pp. 211-239.

Service: Professor Maxim creates myriad opportunities for youth in Michigan to put their love of gaming to creative and productive use. Not only has he championed the gaming track of the Computer and Information Science degree both within and well beyond the university, he has created immense goodwill in the community by organizing Computing Merit Badges for Boy Scouts and Girl Scouts on our campus and offering Gaming Days to large numbers of interested

youth in the community. His activities as a scout leader are widely appreciated, earning him several distinguished adult scout service awards (Silver Beaver, District Award of Merit, Venturing Leadership Award, Harold Oatley Distinguished Service Award).

This generous donation of time and highly valued software engineering work is yet another conduit for creating goodwill in the community. In the same collaborative and facilitative spirit, Professor Maxim has hosted several meetings of the Detroit Chapter of the International Game Developers Association on our campus, and has gained national recognition for his innovative game-design classes: in the past they were awarded top 10 status by the Global Gaming League. (Note: Currently in top 50 ranked 36 by Princeton Review).

Since his last promotion, Professor Maxim's internal service has consisted of being the chair or vice chair for seven campus/college-level committees, chair or vice chair for five department committees, a member of 28 campus/college-level committees, a member of six department committees, and a program advisor for 4 programs. His external service, since his last promotion, has consisted of being an editorial board member for three journals, a program committee member for 11 international conferences, a member of three education curriculum committees/task forces, being a reviewer for many book manuscripts/proposals and grant proposals, and many activities for outreach, diversity/climate, and mentoring.

External Reviewers:
Reviewer A: "Dr. Maxim has a lot of publications, some of which he published in the late 1970's. The quality of the publications that I reviewed is quite acceptable for promotion to professor in the computing community and more specifically for schools similar to yours. Correspondingly, the impact numbers are in line. … Looking at Dr. Maxim's educational contributions, the co-authored book (with Roger Pressmen) *Software Engineering: A Practitioner's Approach*, 8th Ed., McGraw-Hill, 2014. This edition of the book is very popular among computing and software engineering programs both with faculty and students. Similarly, his involvement with previous editions of the book stand as a major contribution to the software engineering education community."

Reviewer B: "Dr. Maxim's journal publications I have had a chance to read can be characterized as valuable description and analyses of educational experiences in teaching undergraduate computer science."

Reviewer C: "His publications date back many years, to 1977, but he has published regularly during his career, including some recent articles dating from 2013 and 2015. In terms of both quantity and quality, his research publication output is very good. At a university such as my own, some people would argue that the percentage of computer science education research is high compared to the percentage of non-education research. However, in my opinion, education research is extremely important. I rate his research record as excellent."

Reviewer D: "By far the most impressive item in his CV is that he has become co-author of what I believe to be the most influential textbook in software engineering. … This is a major honour and shows he is regarded highly."

Reviewer E: "Based on a reading of the papers provided in his portfolio, I would say that the quality of Dr. Maxim's technical papers is very good. … In my opinion, this number of technical papers published in the refereed literature is a respectable number for a candidate for promotion to professor. … In my opinion, this shows sufficient depth and breadth for promotion to professor."
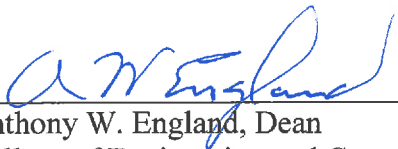
Reviewer F: "The ASEE/IEEE conference, which seems to be Dr. Maxim's home conference so to speak, would be an excellent venue. Both of these professional societies are appropriate for his area and maintain excellent quality in their conferences. ... He shows careful scholarship in his research articles."

Reviewer G: "I feel that Dr. Maxim has accumulated an impressive body of work since receiving tenure and ranks as one of the leaders in Software Engineering Education worldwide."

Reviewer H: "Recently, Dr. Maxim became a co-author of the seminal and most respected software engineering textbook, 'Software Engineering: A Practitioner's Approach.' I can sum up my reaction to this co-authorship as, 'Wow. I'm impressed!' Roger Pressman must have tremendous faith and respect in Dr. Maxim to entrust the reputation of his book with Dr. Maxim."

Summary of Recommendation:
We are pleased to recommend, with strong support of the College of Engineering and Computer Science Executive Committee, Bruce R. Maxim for promotion to professor of computer and information science, with tenure, Department of Computer and Information Science, College of Engineering and Computer Science.


Anthony W. England, Dean
College of Engineering and Computer Science

Daniel Little, Chancellor
University of Michigan-Dearborn


May 2017