

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

Vijay G. Subramanian, associate professor of electrical engineering and computer science, without tenure, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for the granting of tenure to be held with his title of associate professor of electrical engineering and computer science, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:

- Ph.D. 1999 University of Illinois at Urbana-Champaign, Electrical Engineering, Champaign, IL  
M.S. 1995 Indian Institute of Science, Electrical Communication Engineering, Bangalore, India  
B.S. 1993 Indian Institute of Technology, Electronics and Communication, Madras, India

Professional Record:

- 2014-present Associate Professor without tenure, Department of Electrical Engineering and Computer Science, University of Michigan  
2011-2014 Research Assistant Professor, Department of Electrical Engineering and Computer Science, Northwestern University, Evanston, IL  
2010-2011 Senior Research Associate, Department of Electrical Engineering and Computer Science, Northwestern University, Evanston, IL  
2010-2010 Research Fellow, Laboratory for Information and Computer Science, Massachusetts Institute of Technology, Cambridge MA  
2006-2010 Research Fellow, Hamilton Institute, National University of Ireland, Maynooth, Co. Kildare, Ireland  
2004-2006 Distinguished Member of Technical Staff, Performance Analysis and Availability Department, Motorola Inc., Arlington Heights, IL  
2001-2004 Senior Staff Engineer, Mathematics of Communication Networks, Motorola Inc., Arlington Heights, IL  
1999-2000 Lead Engineer, Mathematics of Communication Networks, Motorola Inc., Arlington Heights, IL

Summary of Evaluation:

Teaching: Professor Subramanian has made significant contributions to teaching. He developed the first course on social networks in the College of Engineering, from an analytical perspective, EECS 444/544 Analysis of Societal Networks, offered simultaneously for seniors and graduate students. Students in this course, and others (sophomore to advanced graduate level), appreciate Professor Subramanian's enthusiasm in teaching, his devotion to their needs, and his constant efforts at improving the course. He significantly revised the curriculum of our single graduate offering in Communication Networks (EECS 557). He developed an advanced graduate course on Probabilistic Analysis of Large-Scale Systems. He invested effort in developing new

materials for our sophomore-level course EECS 216 the first time he taught this course. As a mentor of doctoral students, he encourages his advisees to explore new problem domains, while providing hands-on close monitoring when needed. Professor Subramanian has graduated five Ph.D. students (four as co-chair, three of these at other universities). He currently advises another four with one expected to graduate this year. He is also active with Master's and undergraduate students.

Research: Professor Subramanian is an internationally recognized researcher in the broad area of network systems. Network systems are at the core of our connected technological society, either in the form of technological networks (e.g., communication or computer networks), or in the form of social or economic networks. His research agenda covers both forms, and has followed the rapid evolution of the field. His discoveries have direct applicability to current technology in network systems. A prime example is his recent work on Personalized PageRanks, which have many applications, such as: community detection and graph similarity, who to follow on Twitter, connection recommendation on social networks like LinkedIn or Facebook, video suggestion on YouTube, or protein function prediction and analysis of microarray experiments in biology. A second example is provided by his results on the dynamics of opinion formation, which provide mathematical explanations about how a community can eventually agree to a wrong conclusion. His publication record, both overall and since coming to Michigan, is very strong, including nine journal articles with Michigan students as lead author. He publishes in highly selective venues. Professor Subramanian has secured healthy funding including three NSF grants at Michigan to support his research.

Recent and Significant Publications:

- D. Vial, V. Subramanian, "A structural result for Personalized PageRank and its algorithmic consequences," *Proceedings of the ACM on Measurement and Analysis of Computing Systems (ACM POMACS)*, 06/2019; 3(2).
- J. Li, B. Xia, X. Geng, H. Ming, S. Shakkottai, V. Subramanian, L. Xie, "Mean Field Games in Nudge Systems for Societal Networks," *ACM Transactions on Modeling and Performance Evaluation of Computing Systems (ACM TOMPECS)*, 08/2018; 3(4).
- J. Li, S. Shakkottai, J. Lui, V. Subramanian, "Accurate Learning or Fast Mixing? Dynamic Adaptability of Caching Algorithms," *IEEE Journal on Selected Areas in Communications*, 06/2018; 36(6): 1314-1330.
- B. Xia, S. Shakkottai, V. Subramanian, "Small-Scale Markets for Bilateral Resource Trading in the Sharing Economy," *IEEE INFOCOM 2018*, 04/2018.
- J. Huang, V.G. Subramanian, R. Agrawal, and R. Berry, "Downlink scheduling and resource allocation for OFDM systems," *IEEE Transactions on Wireless Communications*, 2009; 8(1): 288-296.

Service: Professor Subramanian has an outstanding record of internal and external service. Internally, he has brought considerable energy to the Electrical and Computer Engineering Division, and especially to the Networks, Communications, and Information Systems group. He has played an active role in graduate student and faculty recruiting, including successfully recruiting underrepresented minority students. He has brought many distinguished speakers to technical seminar series. Externally, he is a leader in his research community, as a workshop organizer and chair of special tracks at prestigious conferences. The community is recognizing

his technical and organizational skills, as he has served as a co-chair of the technical program committees of MobiHoc 2019 and will serve as a co-chair of WiOpt 2020, two flagship conferences.

External Reviewers:

Reviewer A: “He is simultaneously a master of cutting edge theories, as well as a master of issues bottlenecking the latest generation of technological systems.”

Reviewer B: “Over the past decade Prof. Subramanian has been among the most active and prolific members of the networking research community.”

Reviewer C: “A successful engineering department today needs more of his breed of researcher . . . I rank him among the best of his peer group in network science.”

Reviewer D: “I believe that his research and service record would earn him tenure at the top universities in the country...”

Reviewer E: “There is no doubt that Vijay would get this promotion in my department and I recommend it enthusiastically.”

Summary of Recommendation: Professor Subramanian is a world leader in the field of network systems, from communication networks to social networks. He is an outstanding mentor of graduate students, and a dedicated and caring teacher of undergraduate and graduate students. He has shown remarkable engagement in service activities. It is with the support of the College of Engineering Executive Committee that I recommend Vijay G. Subramanian for the granting of tenure to be held with his title of associate professor of electrical engineering and computer science, Department of Electrical Engineering and Computer Science.



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Alec D. Gallimore, Ph.D.  
Robert J. Vlasic Dean of Engineering  
College of Engineering

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