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, 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 Illinois, Electrical Engineering, Urbana-Champaign
M.S.         1995        Indian Institute of Science, Electrical Communication Engineering,
                         Bangalore, India
B. Tech.     1993        Indian Institute of Technology, Electronics and Communication,
                         Madras, India

Professional Record:
2020 – present    Associate Professor (with tenure), Department of Electrical Engineering and
                  Computer Science, University of Michigan
2014 – 2019       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, Electrical Engineering and Computer Science,
                  Northwestern University, Evanston, IL

Summary of Evaluation:
Teaching:  Professor Subramanian has made outstanding contributions to classroom teaching, curriculum development, and mentoring graduate students.  He has taught courses at the graduate and undergraduate levels, with great evaluation scores and enthusiastic feedback from students.  He has made important contributions to curriculum development, including introducing a brand-new course on societal networks and numerous revisions of existing courses.  Professor Subramanian has provided an immersive, encouraging, and supportive environment for the members of his research group.  He has graduated five Ph.D. students as the chair with another two in progress.  He has also graduated five Ph.D. students as the co-chair and has served as a member of 24 Ph.D. committees.

Research:  Professor Subramanian's research focuses on multi-agent system design and analysis, which involves a system of multiple entities (controllers) that have different levels of information among them.  This is a rich problem space, which touches on cooperation, competition, strategy, and other concepts, and has applicability in communication networks, social networks, search ad auctions, e-commerce transactions, and elsewhere.  He also works on random dynamical systems, distributed optimization, random graph models of networks, and other topics.  Professor Subramanian's work is fundamental and mathematically rigorous yet has

made practical impact in areas such as wireless spectrum sharing via regulatory boards. He has published a total of 37 journal papers and over 70 conference papers in his career. His research has been supported through grants from the NSF and the DoD, among others.

Recent and Significant Publications:

Moharrami, M., Subramanian, V., Liu, M. and Sundaresan, R., "The Erlang Weighted Tree, A New Branching Process," *Random Structures and Algorithms (RSA)*, June 2023.

Tang, D., Tavafoghi, H., Subramanian, V., Nayyar, A. and Teneketzis, D., "Dynamic games among teams with delayed intra-team information sharing," *Dynamic Games and Applications (DGAA)*, 13(1), pp.353-411, 2023.

Kao, H. and Subramanian, V., "Common information based approximate state representations in multi-agent reinforcement learning," In *International Conference on Artificial Intelligence and Statistics (AISTATS)* (pp. 6947-6967). 2022.

Kao, H., Wei, C.Y. and Subramanian, V., "March. Decentralized cooperative reinforcement learning with hierarchical information structure," In *International Conference on Algorithmic Learning Theory (ALT)* (pp. 573-605), 2022.

D. Vial and V. Subramanian, "Local Non-Bayesian Social Learning With Stubborn Agents," in *IEEE Transactions on Control of Network Systems (TCNS)*, vol. 9, no. 3, pp. 1178-1188, Sept. 2022.

Service: Professor Subramanian has been an excellent citizen in the university and the profession and has provided effective leadership service to the department after joining UM. He served on a number of departmental committees and served as the chair of the Faculty Workload Task Force. He made a great effort to enhance DEI. He was the point person for the EECS Department at Michigan to host the EECS Rising Stars program and has spent effort in the seminar organizing activities to ensure diverse representation. He is also an active member and an established leader of several professional societies, including networking, performance analysis, operations research, and applied probability. Professor Subramanian served as the TPC co-chair of multiple premier conferences and an associate editor of flagship journals in these areas.

External Reviewers:

Reviewer A: "…the work of Prof. Subramanian stands out for its originality, technical depth and breadth in terms of methodological approaches as well as thematic directions. He is widely recognized as one of the key authorities worldwide when it comes to fundamental challenges at the intersection of network optimization, information theory and applied probability."

Reviewer B: "I am extremely impressed by the lines of scholarly research works carried out by Prof. Vijay Subramanian. These works are fundamental, insightful, and more importantly, provide a well disciplined framework for engineers to develop family of algorithms for distributed learning (e.g., many machine learning and AI systems)…Prof. Vijay Subramanian has established himself as one of the most important researchers in the field of multi-agent systems."

Reviewer C: "He has been very skillful at extracting good analytical problems from complicated engineering situations in an ever increasing number of application domains. The problems are

interesting in their own right, and yet address pertinent and timely engineering concerns; the technical depth is nicely supported by a diversified mathematical arsenal. I am also very impressed by the broad range of topics covered in his research output. ... He is a strong asset to your large research and teaching programs in the areas of communications and controls…"

Reviewer D: "…Dr. Subramanian is an internationally known researcher in stochastic systems with a focus on networked systems and learning."

Reviewer E: "…he demonstrated the rare ability to move seamlessly between disparate technical areas and make substantial contributions in each --- a hallmark of a scholar. … Vijay chooses his problems carefully and works on problems of importance. His work is technically deep and of high quality, and has the potential for having a long-lasting impact."

<u>Summary of Recommendation</u>: Professor Subramanian is an established leader in multi-agent system design and analysis. He published high-quality papers in premier journals and conferences. Professor Subramanian made outstanding contributions to classroom teaching, curriculum development, and mentoring graduate students. He has been an excellent citizen in the university and the profession and has provided effective leadership service to the department. It is with the support of the College of Engineering Executive Committee that I recommend Vijay G. Subramanian 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

May 2024