PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Industrial and Operations Engineering

Viswanath Nagarajan, assistant professor of industrial and operations engineering, Department of Industrial and Operations Engineering, and assistant professor of electrical engineering and computer science, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to associate professor of industrial and operations engineering, with tenure, Department of Industrial and Operations Engineering, and associate professor of electrical engineering and computer science, without tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:
Ph.D.   2009   Carnegie Mellon University, Algorithms, Combinatorics, and Optimization, Pittsburgh, PA
M.S.   2006   Carnegie Mellon University, Algorithms, Combinatorics, and Optimization, Pittsburgh, PA
B.Tech.   2003   Indian Institute of Technology, Computer Science and Engineering, Bombay, India

Professional Record:
2018 – present   Assistant Professor, Department of Computer Science and Engineering, University of Michigan
2014 – present   Assistant Professor, Department of Industrial and Operations Engineering, University of Michigan
2009-2014   Research Staff Member, Business Analytics and Mathematical Sciences, IBM T.J. Watson Research Center, Yorktown Heights, NY

Summary of Evaluation:
Teaching: Professor Nagarajan has a strong record of teaching optimization courses at all levels. He developed a new and highly successful course, IOE 410, as a much-needed follow-on to a required introductory undergraduate course in optimization. He has successfully taught the masters level IOE 510, and several times the Ph.D. offering, IOE 610. Finally, he taught an advanced Ph.D. level special topics course, IOE 691, on approximation algorithms. The course evaluation numbers are uniformly high and speak to him as a conscientious, diligent, and well-prepared instructor who treats students with kindness and respect. For his excellence in the classroom, the College of Engineering recognized Professor Nagarajan with a 2020 Holt Teaching Award. He has also achieved success in research mentoring, having graduated one Ph.D. student, with two more expected to graduate (one as co-chair) in 2020.

Research: Professor Nagarajan works on the design of efficient algorithms for combinatorial optimization problems with provable performance guarantees, for important problems arising in many industrial sectors of the economy. He has made significant contributions on several topics in the area of approximation algorithms, and is particularly well regarded for results in

submodular optimization. For instance, he has developed innovative methods for adaptive submodular ranking, which has potential applications in vehicle routing. His publication record is outstanding, as measured by the quality and quantity of published articles. His work was recognized with the prestigious NSF CAREER award in 2018.

Recent and Significant Publications:

Fatemeh Navidi, Prabhanjan Kambadur, Viswanath Nagarajan, "Adaptive Submodular Ranking and Routing," *Operations Research*, 2019, Accepted, in press.

Viswanath Nagarajan, Joel Wolf, Andrey Balmin, Kirsten Hildrum, "Malleable Scheduling for Flows of Jobs with Applications to MapReduce," *Journal of Scheduling*, 2019; 22(4): 393–411.

Viswanath Nagarajan, Baruch Schieber, Hadas Shachnai, "The Euclidean k-Supplier Problem," *Mathematics of Operations Research*, 2019, Accepted, in press.

Xiangkun Shen, Viswanath Nagarajan, "Online Covering with Sum of L_q-Norm Objectives," *Mathematical Programming (A)*, 2019, Accepted, in press.

Viswanath Nagarajan, Cong Shi, "Approximation algorithms for inventory problems with submodular or routing costs," *Mathematical Programming (A)*, 2016; 160(1-2): 225-244.

Service: Professor Nagarajan has been active in internal service, having served in multiple roles, including seminar organizer, member of IOE's graduate admissions committee, and freshman student advisor for IOE. As for external service, Professor Nagarajan is an associate editor for *ACM Transactions on Algorithms*, he has co-edited special issues and volumes, and he was co-chair of the local committee for the Integer Programming and Combinatorial Optimization (IPCO) conference held at UM last summer. He has served on numerous conference program committees and grant review panels.

External Reviewers:

Reviewer A: "… Vish is a leading researcher of his generation in the area of algorithms and discrete optimization. His work has resolved important open problems, and has added several novel technical ideas of broad interest to discrete optimization."

Reviewer B: "Comparing Vish to the best researchers [of his cohort] in the area of algorithms & optimization, I would place him in the top tier."

Reviewer C: "…I strongly recommend the promotion of Professor Viswanath Nagarajan to the rank of associate professor with tenure. I believe that were he to be on the faculty at [my institution] he would have been readily promoted to the tenured associate professor rank."

Reviewer D: "Prof. Nagarajan has made significant and exciting contributions to approximation algorithms, online algorithms, and more recently, to the domain of stochastic optimization. I would rank him among the top algorithms researchers of his generation."

Reviewer E: "In reviewing his CV, it is clear that Nagarajan has displayed all of the characteristics one would hope for within the portfolio of a candidate being considered for tenure."

Reviewer F: "Let me say upfront that the University of Michigan, as any high-ranking university, can be proud to have Viswanath Nagarajan, a brilliant [junior] researcher of great scientific stature, as a member of its faculty."

Reviewer G: "He is an outstanding scholar in our field, very well suited for this position. There could hardly be a better choice. I would not hesitate to offer him a tenured professorship at my university His research is already at the level of a full professor."

<u>Summary of Recommendation</u>: Professor Nagarajan is an outstanding researcher and educator who has a strong scholarly reputation among his peers. He shows all the promise of an outstanding scholar who will become a leader in the field of industrial and operations engineering. It is with the support of the College of Engineering Executive Committee that I recommend Viswanath Nagarajan for promotion to associate professor of industrial and operations engineering, with tenure, Department of Industrial and Operations Engineering, College of Engineering.

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

May 2020