

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

Mariel S. Lavieri, assistant professor of industrial and operations engineering, Department of Industrial and Operations Engineering, College of Engineering, is recommended for promotion to associate professor of industrial and operations engineering, with tenure, Department of Industrial and Operations Engineering, College of Engineering.

Academic Degrees:

- Ph.D. 2009 University of British Columbia, Sauder School of Business, Management Science, Vancouver, BC, Canada
M.S. 2004 University of British Columbia, Sauder School of Business, Management Science, Vancouver, BC, Canada
B.S. 2002 University of Florida, Industrial and Systems Engineering, Gainesville, FL
B.A. 2002 University of Florida, Statistics, Gainesville, FL

Professional Record:

- 2010-present Assistant Professor, Industrial and Operations Engineering Department, University of Michigan
2009 Visiting Scholar, Department of Industrial and Operations Engineering, University of Michigan

Summary of Evaluation:

Teaching: Professor Lavieri is a strong classroom teacher. She has taught a large undergraduate class (IOE 316, Introduction to Markov Processes, with an average enrollment of nearly 120). Her Q1/Q2 scores have consistently improved in this course. Most recently, they were 4.71/4.75. In addition, she created IOE 513 (originally IOE 591) Healthcare Operations Research receiving average scores of 4.16/4.30. She has also taught IOE 440 (Operations Analysis and Management) with Fall 2015 scores of 4.33/4.39. Professor Lavieri's students describe her as a dedicated and enthusiastic instructor who can teach intellectually challenging topics effectively. She has engaged undergraduate students in most of her research projects. She has completed one Ph.D. student, with another expected to graduate this spring. She is working with another four in earlier phases of their work. In addition, she has served on several other dissertation committees, mentored nine M.S. students and she has involved numerous undergraduate students in her research.

Research: Professor Lavieri's research focuses on the application of stochastic models to medical screening and treatment decision making for patients with chronic diseases; she has also worked in the area of healthcare workforce planning. She is recognized as one of the leading scholars in the development of individualized treatment plans for chronic diseases such as glaucoma. Her research has had an impact on the engineering area of stochastic modeling through the development of new models and methods of analysis for complex deteriorating systems. She has also had an impact on the field of medicine through the discovery of innovative approaches to decision making in the new and fast growing realm of personalized medicine. She has published 18 archival papers and has another nine under review. She publishes her work in a combination of top operations research/industrial engineering journals as well as leading medical journals. Her work has appeared

in *Operations Research*, *Healthcare Management Science*, and *Interfaces* on the operations research end and *Liver Transplantation*, *Journal of Urology*, *Ophthalmology*, and *Pediatrics* in medicine. She has received funding for her research with one NSF grant, one foundation grant and several internal grants including an MCubed project. She was recently awarded an NSF CAREER grant. In addition, she has an NIH R01 grant under review. Her work has been recognized with numerous awards including a Bonder Scholarship, the Pierskalla Award, and the Lee Lusted Award for Quantitative Methods and Theoretical Developments in Medical Decision Making. Her students have also been recognized with such awards as the Doing Good with Good OR (Operations Research) award from INFORMS, and the Lee Lusted Award and the Bonder Scholarship.

Service: Professor Lavieri excels in the service area. She serves as the IOE Diversity Ally. Since she took this post, the percentage of underrepresented minority Ph.D. students in the department has grown from about 12% to nearly 40%. She has consistently mentored SROP students. She is the advisor for the IOE INFORMS Student Chapter, which has consistently won Cum Laude or Magna Cum Laude recognition from INFORMS. The student chapter president won the prestigious Judith Liebman award from INFORMS that recognizes outstanding student volunteers. She has developed an exciting emergency room simulation game that she has used in local middle schools to teach students about industrial engineering. The national Bonder Scholars adopted this simulation game for use in their service day a few years ago. She served as an elected member on the IOE Department Committee in 2011 and she currently serves on the IOE Faculty Recruiting Committee. Nationally, she has been active in many INFORMS groups. For example, she has served as the secretary and treasurer of the INFORMS Section on Public Programs, Services and Needs. She also has served as a referee for numerous journals in her field and as a member of the editorial board of *Operations Research for Healthcare*.

Recent and Significant Publications:

- J. Helm, M.S. Lavieri, M. Van Oyen, J. D. Stein and D. Musch, "Dynamic Forecasting and Control Algorithms of Glaucoma Progression for Clinician Decision Support," *Operations Research* (in press).
- N. Parikh, D. Hutton, W. Marrero, K. Sangani, Y. Xu and M.S. Lavieri, "Projections in Donor Organs Available for Liver Transplantation in the United States: 2014-2025," *Liver Transplantation*. 21:855-86, 2015.
- G. Schell, M.S. Lavieri, X. Li, A. Toriello, K. Martyn and G. Freed, "Strategic Planning of Pediatric Nurse Practitioners: Yielding Self-Sufficiency," *Pediatrics*. 135(2): 298-306, 2015.
- E. Lee, M.S. Lavieri, M. Volk and Y. Xu, "Applying Reinforcement Learning Techniques to Detect Hepatocellular Carcinoma Under Limited Screening Capacity," *Health Care Management Science* 1-13, 2014.
- M. Hu, B. Jacobs, H. Chang, J. Ye, J. Brathwaite, T. Morgan, J. S. Montgomery, K.S. Hafez, A.Z. Weizer, S. Gilbert, C.T. Lee, M.S. Lavieri, J.E. Helm, B.K. Hollenbeck and T.A. Skolarus, "Sharpening the Focus on Causes and Timing of Readmission after Radical Cystectomy for Bladder Cancer," *Cancer*. 120(9): 1409-1416, 2014.

External Reviewers:

Reviewer A: "She has worked on a variety of interesting problems in health care, has formed a number of multidisciplinary research collaborations, and is productive . . . I have no doubt she will continue on this path in the future."

Reviewer B: "...Mariel is one of the relatively rare individuals who excels in both theory and practice . . . Mariel Lavieri has demonstrated that she is well on track as a superstar in both applied and theoretical healthcare research . . . I am confident that she would be eligible for promotion at [my institution]."

Reviewer C: "Professor Lavieri's papers are of very high quality and show great creativity both in problem formulation and solution methodologies. She is clearly one of the leading researchers [in her cohort] in applying dynamic programming and stochastic control to healthcare problems."

Reviewer D: "Her contributions in the areas of research, mentoring, teaching and service are excellent – she truly raises the bar to a new level."

Reviewer E: "Her list of research awards is quite impressive for someone at this early stage of her career . . . I anticipate that she will continue to make interesting contributions to the field . . . Simply put, she is a keeper."

Reviewer F: "The many awards for which Dr. Lavieri has been a finalist or winner has certainly established her scholarly visibility at the national and international level . . . Her strong ties to the medical community and her ideas for future work will undoubtedly lead to an impressive future in this field."

Reviewer G: "...Dr. Lavieri is not only very productive but the work produced is of excellent quality ... Dr. Lavieri surpasses the requirements for someone being considered for promotion at any research university. U of M is lucky to have her!"

Reviewer H: "In short, the innovation in Professor Lavieri's work is excellent. It is not surprising that she has developed a strong program of external research funding to support her efforts."

Summary of Recommendation: Professor Lavieri is a very productive industrial engineer who has made significant contributions to the field of medical decision making and the treatment of patients with chronic diseases. She is a very strong teacher and an excellent research mentor. Her internal and external service are exemplary. It is with the support of the College of Engineering Executive Committee that I recommend Mariel S. Lavieri for promotion to associate professor of industrial and operations engineering, with tenure, Department of Industrial and Operations Engineering, College of Engineering.



David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

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