

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

Marina A. Epelman, associate professor of industrial and operations engineering, with tenure, Department of Industrial and Operations Engineering, is recommended for promotion to professor of industrial and operations engineering, with tenure, Department of Industrial and Operations Engineering, College of Engineering.

Academic Degrees:

Ph.D. 1999      Massachusetts Institute of Technology, Operations Research, Cambridge, MA  
B.A. 1995      Cornell University, Mathematics, Ithaca, NY

Professional Record:

2005-present      Associate Professor, Department of Industrial and Operations Engineering,  
University of Michigan  
1995-2005      Assistant Professor, Department of Industrial and Operations Engineering,  
University of Michigan

Summary of Evaluation:

Teaching: Professor Epelman is an accomplished and well-respected teacher. She has taught nine different courses in her years at Michigan with average Q1/Q2/Q4 scores of 4.2/4.3/4.5. The courses have ranged from introductory undergraduate courses to advanced graduate optimization courses. She has developed new graduate integer programming and non-linear programming courses and has significantly revised other graduate courses. Professor Epelman has supervised eleven Ph.D. dissertations (ten co-advised) and is currently co-advising two Ph.D. students. She has served as a member of over 20 other dissertation committees. In addition, she has mentored eight Tauber projects. Professor Epelman won the 2016 Holt Award for Teaching Excellence and won the IOE Graduate Professor of the year award in 2015 and again in 2016. The strong letters from students attest to her excellence in teaching and mentoring.

Research: Professor Epelman's research is broadly in the area of optimization theory, algorithms and applications. On the theoretical and algorithmic side, she has worked on countably infinite linear programming problems with applications to Markov Decision Processes. In applications, she has worked on intensity modulated radiation therapy (IMRT) and automotive crash-testing. The crash-testing work, in collaboration with Ford Motor Company, was a finalist in the prestigious Daniel H. Wagner Prize for Excellence in Operations Research Practice. She is also working on multi-criteria personnel scheduling. She has secured roughly \$675,000 in past grants from a variety of agencies and companies and currently has nearly \$600,000 in funding. Professor Epelman has published 23 refereed publications, most of which are with IOE colleagues. She has given over 15 invited presentations. She is a valued collaborator on student

dissertation supervision, research papers and funded research. She has over 1100 citations to her work and an h-index of 14 (Google Scholar).

#### Recent and Significant Publications:

- I. Dolinskaya, M. Epelman, E. Sisikoglu and R.L Smith, “Parameter-free Sampled Fictitious Play for Solving Deterministic Dynamic Programming Problems,” *Journal of Optimization Theory and Applications*, 169(2):631–655, 2016.
- D. Reich, Y. Shi, M. Epelman, A. Cohn, E. Barnes, K. Arthurs and E. Klampf, “Scheduling Crash tests at Ford Motor Company,” *INTERFACES*, 2016, accepted.
- V. W. Wu, M.A. Epelman, H.E. Romeijn, M. Feng, Y. Cao, H. Wang, R.K. Ten Haken and M. Matuszak, “Optimizing Global Liver Function in Liver SBRT Treatment Planning,” Proceedings of 57th Annual Meeting of the American Association of Physicists in Medicine, 2015.
- I. Lee, M. A. Epelman, H. E. Romeijn and R. L. Smith, “Extreme point characterization of constrained non stationary infinite-horizon Markov decision processes with finite state space,” *Operations Research Letters*, 42:238-245, 2014.
- F. Peng, X. Jia, X. Gu, M.A. Epelman, H.E. Romeijn, S.B. Jiang, “A new column generation based algorithm for VMAT treatment plan optimization,” *Physics in Medicine and Biology*, 57:4569-4588, 2012.

Service: Professor Epelman has provided outstanding service to the department and the profession. She has served as the chair of the IOE Graduate Admissions and Financial Aid committee since 2012. She was the ABET chair for IOE’s last review in 2011. She served on the elected IOE Department Committee during the 2012-13 academic year. At the college level, she was a freshman advisor for 13 years and served on the CoE Curriculum committee 2007-2011 (as the chair 2009-2011). She has served in elected positions for all three of the major optimization professional societies. She currently serves as the treasurer of the Mathematical Optimization Society, was the secretary of the SIAM Activity Group on Optimization from 2011-2013, and was the treasurer and secretary of the INFORMS Optimization Society from 2008-2011. She currently serves as an associate editor of *Optimization and Engineering* and was an associate editor of *Operations Research* from 2006-2011.

#### External Reviewers:

Reviewer A: “The quality of Marina’s work in radiation oncology...is outstanding. ...She is one of the few people who can bridge the fields of operations research and radiation oncology.”

Reviewer B: “...every one of her papers appears in a strong outlet...”

Reviewer C: “...the quality of her research contributions, her commitment to educational activities, and her wide footprint of service have all been superb.”

Reviewer D: “She has made important contributions to the foundations of mathematical optimization...Her work on fictitious play is particularly impactful...Dr. Epelman has an excellent record, and perhaps an even better trajectory.”

Reviewer E: "...Dr. Epelman's work reflects a strong mix of optimization theory, algorithms and applications."

Reviewer F: "These two papers are a tour de force of a broad spectrum of operations research concepts and tools applied to a very practical application area...."

Reviewer G: "Overall, I would rank Dr. Epelman very highly and strongly believe that she would be an excellent candidate for the same position at my institution..."

Summary of Recommendation: Professor Epelman has an impressive record of teaching and university and national service and a very strong research record as outlined above. It is with the support of the College of Engineering Executive Committee that I recommend Marina A. Epelman for promotion to 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 2017