

Susan E. Martonosi

Director, Global Clinic
Joseph B. Platt Professor for Teaching Excellence
Professor of Mathematics
Harvey Mudd College
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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

Ph.D. in Operations Research, 2005

Cornell University, Ithaca, NY

B.S. in Operations Research and Industrial Engineering, 1999
Summa Cum Laude

ACADEMIC APPOINTMENTS

2017 – present:

Professor of Mathematics, Harvey Mudd College, Claremont, CA

2016 – present:

Director, Global Clinic, Harvey Mudd College, Claremont, CA

2014 – present:

Joseph B. Platt Professor for Teaching Excellence, Harvey Mudd College, Claremont, CA

2011 – 2017:

Associate Professor of Mathematics, Harvey Mudd College, Claremont, CA

2010-2014:

Mathematics Clinic Director, Harvey Mudd College, Claremont CA

2005 – 2011:

Assistant Professor of Mathematics, Harvey Mudd College, Claremont, CA

REFEREED JOURNAL PUBLICATIONS

2017. "Active Learning in ORMS Education." *Wiley Encyclopedia of Operations Research and Management Science*, to appear.

2016. "A Survey of Statistical Capstone Experiences," (with T. D. Williams). *Journal of Statistics Education*, Vol. 24, No. 3, pp. 127-135.

2016. "Multi-year optimization of malaria intervention: a mathematical model" (with H. Dudley, C. J Orellana, A. Goenka). *Malaria Journal*, 15:133, DOI 10.1186/s12936-016-1182-0.

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2015. "Characteristics of Optimal Solutions to the Sensor Location Problem" (with D. R. Morrison). *Annals of Operations Research*, Vol. 226, No. 1, pp 463–478.
2012. "Cooperative Search with Autonomous Vehicles in a 3D Aquatic Testbed" (with M. Keeter, D. Moore, R. Muller, E. Nieters, J. Flenner, A. L. Bertozzi, A. G. Percus, R. Levy). *Proceedings of the 2012 American Control Conference*.
2012. "Project-Based ORMS Education". *Wiley Encyclopedia of Operations Research and Management Science*.
2011. "Dynamic Server Allocation at Parallel Queues". *IIE Transactions*, Vol. 43, No. 12, pp. 863-877.
2011. "Flight Delays at RegionEx" (with A. Farahat). *INFORMS Transactions on Education*, Vol. 11, No. 3, pp. 100-105.
2006. "How Effective Is Security Screening of Airline Passengers?", (with Arnold I. Barnett). *Interfaces Special Issue on Homeland Security*.
2004. "Terror is in the Air", (with Arnold I. Barnett). *Chance* (a journal of the American Statistical Association), (17):2, 22-24.

REFEREED BOOK CHAPTERS

2016. "Real Clients, Real Problems, Real Data: Client-Driven Statistics Education", (with T. D. Williams). *Mathematics Education: A Spectrum of Work in Mathematical Sciences Departments*. J. Dewar, P. Hsu, and H. Pollatsek (eds). Springer.
2009. "Applying Risk Assessment to Secure the Containerized Supply Chain", (with M. van de Voort, H. Willis and D. S. Ortiz). *Managing Risk and Security: The Safeguard of Long-Term Success for Logistics Service Providers*. Bern: Haupt Verlag, 2009.
2007. "Applying Risk Assessment to Secure the Containerized Supply Chain", (with M. van de Voort, H. Willis and D. S. Ortiz). *Managing Critical Infrastructure Risk*, I. Linkov, R. J. Wenning, G. A. Kiker (eds.). Springer.
2005. "Evaluating the viability of 100 per cent container inspection at America's ports", (with Henry Willis and David Ortiz). *The Economic Impacts of Terrorist Attacks*, H. W. Richardson, P. Gordon, J. E. Moore II (eds.). Edward Elgar Publishing.

MANUSCRIPTS

2016. "Instructional Guidance for Client-Based ORMS Projects." *Wiley Encyclopedia of Operations Research and Management Science*, under review.
2011. "A New Framework for Network Disruption", (with D. Altner, M. Ernst, E. Ferme, K. Langsjoen, D. Lindsay, S. Plott, A. S. Ronan). <http://arxiv.org/abs/1109.2954>

OTHER PUBLICATIONS

2012. "The INFORMS Undergraduate Operations Research Prize", (with J. Sokol, D. Czerwinski and F. Erhun). *OR/MS Today*, Vol. 29, No. 2.

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2009. "Student-Written Executive Summaries: Educational Tool and Time Saver", *Focus Magazine*.
2008. "Securing OR's Future Through Undergraduate Research", *OR/MS Today*, pp. 10-11.
2007. "Grading Quickly and Consistently Using Equivalence Classes", *Focus Magazine*.

AWARDS AND HONORS

- 2014 – 2019. Joseph B. Platt Chaired Professor for Teaching Excellence, Harvey Mudd College.
2012. Alder Award for Distinguished Teaching by a Beginning College or University Mathematics Faculty Member, Mathematical Association of America.
2009. First place winner of the INFORMS Case Study Competition, "Flight Delays at RegionEx" (with Amr A. Farahat.)
- 2006 – 2007. Project NExT Fellow, Mathematical Association of America.
- 2002 – 2005. Alfred P. Sloan Foundation Fellowship (through MIT Global Airline Industry Program).
2001. Ida M. Green Fellowship Award, MIT.
1999. Merrill Scholar, Cornell University.
1998. Marshall Scholarship Finalist.

INVITED TALKS

2017. "Projects in the ORMS Classroom", INFORMS Teaching Effectiveness Colloquium
2014. "Syllabus and Course Design", INFORMS Teaching Effectiveness Colloquium.
2014. "Senior Capstone Projects: A Taste of the Real World," USC Viterbi School of Engineering, Engineering Education, Active Learning Retreat.
2014. "Using Math to Fight Terrorism", UC Irvine Undergraduate Math Seminar.
2013. "Models for Preventing and Treating Malaria in Resource-Constrained Regions," USC Engineering Honors Colloquium.
2013. "Models for Preventing and Treating Malaria in Resource-Constrained Regions," CSU San Bernardino Mathematics Colloquium.
2012. "Pretty Cars Don't Go Here: Bringing students to the trenches in project-based courses," INFORMS Teaching Effectiveness Colloquium.
2012. "An ORnate ORation on OR," MAA MathFest, Alder Award Session.
2011. "Senior Capstone Projects: A Taste of the Real World", OR Society of East Africa Conference, Keynote Address.
2011. "A Network Flow Approach to Terrorist Network Disruption", UCLA Statistics Seminar.
2011. "Disrupting Terrorist Networks," Naval Post-Graduate School Operations Research Seminar.
2011. "Using Math to Fight Terrorism," Cornell Summer Institute Undergraduate Seminar.
2011. "Dynamic Screener Allocation at Parallel Security Checkpoint Queues", USC METRANS Seminar.

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- 2011. "Using Math to Fight Terrorism", Pacific Coast Undergraduate Mathematics Conference, Plenary Address.
- 2009. "Disrupting Terrorist Networks", CSU San Bernardino Mathematics Colloquium.
- 2009. "OR Models for Counterterrorism", University of Southern California Women in Mathematics Lecture Series.
- 2008. "Operations Research Models for Homeland Security", ORIE Colloquium, Cornell University.
- 2007. "A Queueing Model for Airport Security", CSU San Bernardino Mathematics Colloquium.
- 2007. "Some Issues in Homeland Security", Department of Industrial and Systems Engineering, Georgia Tech, Invited speaker in course on airline operations.
- 2006. "Some Issues in Homeland Security", Mathematics Colloquium, Occidental College.
- 2006. "A Queueing Model for Airport Security", Department of Statistics, University of California at Riverside.
- 2006. "Quantitative Methods for the Deterrence of Terrorists", Department of Industrial and Systems Engineering, USC.
- 2005. "Secure Flights? Models and Observations" MIT Global Airline Industry Program, Industry Advisory Board Meeting.
- 2005. "Loopholes and Deterrence in Airline Passenger Pre-Screening Systems", Homeland Security Institute, Advancing Analytic Techniques in Deterrence Analysis Workshop.

CONFERENCE TALKS

- 2017. "Global Collaboration: An Essential Skill in the 21st Century", 6th International Symposium on Advanced Technology, Kogakuin University, Tokyo, Japan.
- 2017. "Field-Based Projects", INFORMS Annual Meeting, Houston, TX.
- 2014. "Models for Preventing and Treating Malaria in Resource-Constrained Regions", International Federation of Operations Research Societies Conference, Barcelona, Spain.
- 2012. "Flight Delays at RegionEx: A Case Study on Business Data Analysis," INFORMS Annual Meeting, Phoenix, Sponsored Session.
- 2012. "Senior Capstone Projects: A Taste of the Real World," INFORMS Annual Meeting, Phoenix, Sponsored Session.
- 2011. "A New Approach to Network Disruption," INFORMS Annual Meeting, Charlotte, Sponsored Session.
- 2011. "A Network Flow Approach to Terrorist Network Disruption", Joint Statistical Meetings, Miami, Invited session.
- 2011. "Senior Capstone Projects: A Taste of the Real World", International Federation of Operations Research Societies Conference, Melbourne, Australia, Invited session.
- 2011. "A Network Flow Approach to Terrorist Network Disruption", International Federation of Operations Research Societies Conference, Melbourne, Australia.
- 2010. "Disrupting Terrorist Networks", MAA Western Sectional Meeting.
- 2010. "A Network Flow Approach to Terrorist Network Disruption", INFORMS Annual Meeting, Austin.

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- 2008. "Disrupting Terrorist Networks Using Network Flow Centrality", INFORMS Annual Meeting, Washington, D.C.
- 2008. "Constrained Defense Allocations for Multiple Targets", INFORMS Annual Meeting, Washington, D.C.
- 2008. "Incorporating OR Practice in an Intro Course", INFORMS Annual Meeting, Washington, D.C.
- 2007. "Mathematics Clinic Projects: A Capstone Experience for Students, An Exercise in Self-Restraint for Faculty", MathFest, San Jose.
- 2006. "Deterring the Determined: Quantitative Methods for the Deterrence of Terrorists", INFORMS Annual Meeting, Pittsburgh.
- 2005. "Some Issues in Airline Security: A Quantitative Perspective" Society for Risk Analysis Annual Meeting, Orlando.
- 2005. "Evaluating the Security and Efficiency of the Global Containerized Supply Chain: A Case Study of 100% Screening" INFORMS Annual Meeting, San Francisco.
- 2004. "Securing Baggage Holds: A Quantitative Analysis of Three Security Measures", INFORMS Annual Meeting, Denver.
- 2003. "Security Profiling of Airline Passengers: How Effective Would it Be?", INFORMS Annual Meeting Atlanta.

OTHER TALKS

- 2009. "Disrupting Terrorist Networks", Harvey Mudd College Stauffer Lecture Series.
- 2008. "Disrupting Terrorist Networks", Claremont Colleges Mathematics Colloquium.
- 2008. "My Peace Corps Experience: Not how I changed the world, but how the world changed me", CSU Fullerton Mathematics Colloquium.
- 2007. "Some Probabilistic Conundrums", HMC Presidential Inauguration.
- 2006. "A Queueing Model for Airport Security", Claremont Statistics Colloquium.
- 2004. "Some Issues in Airline Security", MIT Global Airline Industry Program, Industry Advisory Board Meeting, 2004.

TEACHING EXPERIENCE

Harvey Mudd College

- Deterministic Operations Research (2006, 2007, 2009, 2011, 2012, 2015, 2016, 2017)
- Introduction to Statistics and Probability (2005, 2006, 2007, 2009, 2011, 2014, 2016, 2017)
- Mathematical Modeling Seminar (2009, 2010, 2011, 2012)
- Multivariable Calculus (2014, 2015, 2016)
- Stochastic Processes (2010, 2012, 2014, 2018)
- Traffic and Transportation Engineering Lab (2012, 2013, 2014)
- Linear Algebra II (2006, 2007, 2008, 2017)
- Advanced Topics in Operations Research (2010, 2012)
- Intermediate Probability (2009, 2013)

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Statistical Linear Models (2006, 2008)
Design and Analysis of Experiments (2007, 2011)
Mathematics Forum (2009, 2014)
Differential Equations II (2009)
Linear Algebra and Dynamical Systems I / Linear Algebra I (2005, 2017)
Calculus, 2013

Claremont Graduate University

Discrete Models, 2012, 2013

Massachusetts Institute of Technology

Engineering Probability and Statistics (Teaching Assistant, 2002, 2003)

U. S. Peace Corps

High School Mathematics (taught in French), Republic of Guinea, 1999-2001

Cornell University

Engineering Probability and Statistics (Teaching Assistant, 1998)
Java Programming (Tutor, 1997)

PROFESSIONAL EXPERIENCE

2008. Contracted Participant, International Transport Forum Joint Transport Research Centre
Round Table: "Security, Risk Perception and Cost Benefit Analysis", Dec. 10-11
2008. Consultant, Private Sponsor.
2005 – 2006. *Consultant*, **Homeland Security Institute**
2002 – 2005. Research Assistant, MIT Global Airline Industry Center.
2004 (Summer). Summer Associate, RAND Corporation.
1999 (Spring). Research Assistant, Cornell University.
1998 (Summer). Research Assistant, Cornell University.
1997 (Fall). Intern, Procter and Gamble (Management Systems), Global Category Management.

STUDENT RESEARCH SUPERVISION

2018. Martin Gonzalez, Will Meng, Cat Ngo, Tyler Sam (Independent Study), Statistical Learning
Methods for Basketball Analytics
2018. Kayla Cummings (Senior Thesis in Math, Pomona), "Operations Research to Model
Government Influence on Vaccine Prices."
2018. Lucius Bynum (Senior Thesis in Math), "From Partially Ranked Data to Fully Ranked
Decisions: Prescriptive Analytics for Professional Basketball Data."
2018. Hamzah Khan (Senior Thesis in Math), "Using Reinforcement Learning to Evaluate
Flexibility in Simple Temporal Networks with Uncertainty."

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2017. Robert (Skipper) Gonzalez (Summer research), "Basketball Analytics".
2017. Kayla Cummings, Emily First, Dan McCabe, Veronica Rivera, Joe Sinopoli (Independent Study), Network Optimization.
2017. Kayla Cummings (Independent Study), Pediatric Vaccine Pricing.
2017. Yichen Lu (Senior Thesis in Math, Pomona), "Modeling the Vehicle Routing Problem in the Real World."
2017. Dina Sinclair (Senior Thesis in Math), "Game Theory Models for Pediatric Vaccine Pricing."
2017. SoCalGas Mathematics Clinic Team, "Evaluation and Optimization of SoCalGas Routing Planning and Algorithms."
- 2012 – 2015. Harry Dudley (Independent research) "Models for Preventing and Treating Malaria in Resource-Constrained Regions."
2015. PotaVida Global Clinic Team, "Creating a Low-Cost Turbidity-Sensitive Solution for Solar Disinfection of Drinking Water."
- 2014 (Summer). Harry Dudley, Cesar Orellana, Shanika Lazo, Abhishek Goenka, "Models for Preventing and Treating Malaria in Resource-Constrained Regions."
2014. NationBuilder Clinic Team, "Predictive Behavior Modeling for Community Organizing."
2014. Sam Gutekunst (Senior Thesis in Math), "Characterizing Network Disruption".
2013. E. & J. Gallo Winery Clinic Team, "Livingston Cooperage Optimization Model".
2013. Taryn Ohashi (Senior Thesis in Math), "Improving a Multiple-Timestep Optimization Model of Malarial Intervention Policy."
- 2012 (Summer). Taryn Ohashi, Katarina Hoeger, Tracey Luke, Tristan Williams, Flora Xu, "Preventing Malaria: A Multiple-Timestep Approach to Optimizing Intervention Policy."
2012. Alice Paul (Sr. Thesis in Math), "Detecting Covert Members of Terrorist Networks".
2011. Chandler May (Sr. Thesis in Math), "Verification of Solutions to the Sensor Location Problem."
2011. DYNAR Clinic Team, "Cooperative Autonomous Aquatic Vehicles: Mathematics and Robotics".
- 2010 (Summer). Liz Ferme, Kira Langsjoen, Danika Lindsay, Andrew Ronan, "Disrupting Terrorist Networks".
2010. Jacob Feldman (Sr. Thesis in Math), "Revenue Management: Optimizing a Restaurant's Reservation Scheduling".
2010. Yaniv Ovadia (Sr. Thesis in Math), "Reconstruction of Gomory-Hu Trees in Response to Vertex Deletion".
2009. Brett Cooper (Independent Study), "Disrupting Terrorist Networks".
- 2009 (Summer). Lee Wiyninger, David Zitter, "Disrupting Terrorist Networks", 2009.
2008. Robert Best, Annika Eberle, Dmitri Skjorshammer (Engineers for a Sustainable World foreign study project), "Alternative Agricultural Techniques in Koundara, Guinea", EPA P3 Award Grant Proposal.
- 2008, 2009. David Lapayowker (Independent Study), "Disrupting Terrorist Networks".
2008. WorldQuant Clinic Team, "Efficient Large-Order Stock Trading."
2008. David Morrison (Sr. Thesis in Math), "Characteristics of Optimal Solutions to the Sensor Location Problem".
2008. Katie Bayard (Sr. Thesis in Math, Pomona College), "A Markov Chain Analysis of Pitching Statistics."

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- 2007 (Summer). Michael Ernst, Sean Plott, "Disrupting Terrorist Networks."
2007 (Summer). Tim Sweda, "Optimal Defense Allocations to Deter Terrorists."
2007. D4 Networks Clinic Team, "A Scheduling and Pricing Model for an Air Taxi Business."
2007. Eugene Quan (Sr. Thesis in Math), "Effective Cost Allocation for Deterrence of Terrorists."
2006 (Summer). Minal Shankar, "Assessing the Value of Information in Deterring Terrorists."
2006 (Summer). Daniel Walton "Optimal Defense Allocations to Deter Terrorists".
2006. Sean Fogarty (Sr. Thesis in Math/Bio), "Location, Location, Location: A Facility Location Approach to Territorial Patrol in the Eastern Collared Lizard (*Crotaphytus collaris*)."

SERVICE TO THE PROFESSION

- 2016 – present. Vice President for Membership and Professional Recognition, INFORMS
2015. Past-President, INFORMS Forum for Women in OR/MS.
2015. INFORMS Professional Recognition Committee.
2013 – 2015. MAA Morgan Prize Committee.
2011 – 2015. VP of Meetings, INFORMS Forum on Education.
2014. President, INFORMS Forum for Women in OR/MS.
2013. President-Elect, INFORMS Forum for Women in OR/MS.
2011 – 2013. Committee Member and Chair (2012), INFORMS Doing Good with Good OR Prize Committee.
2008 – 2010, 2012. Invited Panelist, INFORMS Future Academicians Colloquium.
2012. Member, MAA Course Area Study Group on OR Curriculum for the Committee on the Undergraduate Program in Mathematics.
2010-2011. Committee Member and Chair, INFORMS Undergraduate Research Prize Committee.
2009-2010. VP of Meetings (Jr. and Sr.), INFORMS Forum for Women in OR/MS.
2006 – present. Session Chair, INFORMS Annual Meeting (numerous times).
2005 – present. Journal Reviewer.
Annals of Operations Research
Discrete Applied Mathematics
European Journal of Operations Research
Humanistic Mathematics
IEEE Transactions on Intelligent Transportation Systems
IEEE Transactions on Systems, Man and Cybernetics, Part A
IIE Transactions
INFORMS Transactions on Education
Interfaces
Management Science
Mathematical and Computer Modeling
National Science Foundation
OMEGA
Operations Research
Production and Operations Management
Risk Analysis

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Rose Hulman Mathematics Journal

SIAM Review

Science

Terrorism Research

The UMAP Journal (Undergraduate Mathematics and its Applications)

Wiley Publishing

SERVICE TO HARVEY MUDD COLLEGE

2016 – present. Global Clinic Director.

2016 – present. Faculty Executive Committee.

2014 – present. Hixon Faculty Support Committee.

2018. External Reviewer, Program review at a liberal arts college mathematics department.

2017-2018. Co-chair, Math Department Search Committee

2009 – 2015. Faculty Executive Committee.

2010 – 2014. Mathematics Clinic Director.

2014 (Spring). Assessment and Accreditation Committee.

2012 – 2013. Associate Chair, Mathematics Department.

2011 – 2014. Mentor, Mudders Mentoring Mudders Program.

2009 – 2011. Global Clinic Advisory Board.

2009 – 2010. Operations Research, Statistics and Math Finance seminar series founder and organizer.

2009. Nelson Series planning committee.

2009 (Spring). Computing Committee.

2008 – 2009. Multicultural Ally Program.

2007 – present. Faculty and Department Chair search committees: numerous.

2007 – 2010. PI, “Harvey Mudd College Mathematics Conference Series”, NSF- DMS-0713682 (Co-PI: M. Orrison). Organizer, 2007 Conference: “Public Sector Operations Research”.

2007 – 2010. Faculty Advisor, Engineers for a Sustainable World student chapter.

2007 – 2008. Subcommittee on Improving Diversity through Faculty Hiring.

2007 – 2008. Core Coordinators Committee.

2006 – 2008. Incident Management Team.

2006 – 2008. Faculty-in-Residence, Sontag dormitory.

2006 – 2007. Strategic Planning “Looking Outside the Box” committee.

OUTREACH

2018. Speaker, “Fractals”. Pathways Outreach Program (Stanton Elementary School, Glendora)

2016. Speaker, “Fractals”. Pathways Outreach Program (Pepper Tree Elementary School, Upland)

2015. Speaker, “Who Wants To Be a Millionaire?” Pathways Outreach Program (Sierra Vista Elementary School, Upland).

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2013. Career Panelist, AfterMath Conference.
2013. Speaker (three workshops) Pathways Outreach Program (Sierra Vista Elementary School, Upland).
- 2011, 2006. Speaker, "Some Probabilistic Conundrums". Pathways Outreach Program
2007. Speaker, "Making Decisions Using Math", Pathways Outreach Program.
- 2006-8, 2011-13. Workshop Presenter, "Making Decisions Using Math". SWE WEST Conference.
2006. Speaker, "Using Math to Prevent Terrorism", HMC Summer Institute.
2005. Speaker, "Some Probabilistic Conundrums". Los Angeles Professional Development and Outreach Group.

WORKSHOPS ATTENDED

2018. MESCAl Unconference on Diversity, Equity and Inclusion in the Mathematical Sciences.
- 2015 – present. Data Science Specialization, Johns Hopkins University online courses:
"The Data Scientists Toolbox"; "R Programming"; "Getting and Cleaning Data";
"Exploratory Data Analysis"; "Statistical Inference"; "Regression Models"; "Reproducible Research"; "Machine Learning"; "Developing Data Products".
2014. "Tackling the Challenges of Big Data", MIT Professional Education online course.
2009. "Advances in Count Data Regression", Southern California American Statistical Association Workshop in Applied Statistics.
2008. "OR Practice in Africa", Washington, D.C.
2007. "Teaching Effectiveness Colloquium", INFORMS Annual Meeting.
2007. "The Art of Teaching Mathematics", Harvey Mudd College, June 11-12, 2007.
2007. "Statistics Education for Undergraduate Students", University of California at Riverside.
2007. "Advances in Latent Variable Modeling", Southern California American Statistical Association Workshop in Applied Statistics.
2006. "Applied Longitudinal Analysis" Southern California American Statistical Association Workshop in Applied Statistics.

MEDIA COVERAGE

2011. WAMC Northeast Public Radio, Academic Minute, Dec. 21, 2011. Available online at http://www.publicbroadcasting.net/wamc/news.newsmain?action=article&ARTICLE_ID=1885870
2006. Gilden, J. "Pi in the sky: Math could help protect against terrorism", *LA Times*, Nov. 19, 2006, L3.

LANGUAGES

- English: Native speaker
French: Proficient

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PROFESSIONAL MEMBERSHIPS

Institute for Operations Research and Management Science (INFORMS)

Mathematical Association for America (MAA)