

Michael H. Veatch
Professor of Mathematics
Gordon College
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Education **Massachusetts Institute of Technology**, Cambridge, MA
Ph.D. in Operations Research, 1992.
Thesis title: Queueing Control Problems for Production/Inventory Systems.
Thesis advisor: Lawrence M. Wein
Minor: International Economic Development

Rensselaer Polytechnic Institute, Troy, NY
M.S. in Operations Research and Statistics, 1980.

Whitman College, Walla Walla, WA
B.A. in Mathematics and Physics, 1979. Magna cum laude.

Academic Experience **Gordon College** (1992-present and 1987-1990)
Department Chair 2010-2018 and 2021-present
Professor of Mathematics 2001-present
Recent courses: probability, mathematical statistics, biostatistics, operations research, calculus, vocational seminar, liberal arts math.
Other courses: real analysis, linear algebra, foundations and philosophy of mathematics.

2015, 2005, 1999 Visiting scientist, MIT

1995 Visiting scientist, AT&T Merrimack Valley Works studying inventory control procedures

Summer 1995 Visiting scientist, MIT and Boston University

Industry Experience **The Analytic Sciences Corporation**, Reading, MA *Department Staff Analyst*
1981-1987
Responsible for developing and marketing logistics analysis techniques and for managing team projects. Developed a maximum likelihood technique to estimate demand for repairable items from (censored) stockout data for use in logistics capability models. Developed a reliability model for fault-tolerant systems and applied it to an advanced fighter avionics.

1980 **New York State Higher Education Services Corporation**, Albany, NY
Statistical Analyst: Extracted data from nearly one million records to build a Markov model that projected the cost of their Tuition Assistance Program.

Honors & Awards Honorable mention, 1993 Nicholson student paper competition. Awarded by INFORMS to the best Operations Research & Management Science student papers.
Phi Beta Kappa; National Merit Scholar.

Affiliations Institute for Operations Research and Management Science (INFORMS)

Sponsored Projects

- Summer 2021 Gelsinger Foundation grant: Co-led summer data science practicum, \$57,000 funded from grant already received by Gordon College.
- Summer 2018 Gordon College Center for Teaching Excellence grant: Placement exams and assessing visual concepts in calculus and introductory physics, \$10,000 for joint project.
- 2017-20 Council for Christian Colleges & Universities grant: Informed compassion: how faith shapes decisions in Christian relief, \$17,000 for joint project.
- 2016-17 NSF Preparation for Industrial Careers in Math course planning grant, \$3,000.
- 2016-17 Council for Christian Colleges & Universities grant: Informed compassion: the interplay of faith perspectives and humanitarian logistics, \$3,000 for joint project.
- Summer 2015 Gordon College UG research grant: Robust optimization of supply chains, \$10,000.
- Summer 2014 Gordon College UG research grant: Supply chains and food vouchers in Darfur, \$4,000.
- 2013-14 Center for Faith and Inquiry Fellow: A New Approach to Theistic Evolution: Determinate Outcomes of Random Processes, \$3,000 for joint project.
- Summer 2012 Gordon College grant: Airport congestion during relief operations, \$3,000.
- 2012-13 Gordon College initiative grant: Humanitarian logistics, release time.
- Summer 2008 NSF Research Experience for Undergraduates (REU) supplement: Controlling complex networks: Approximate linear programming techniques, \$12,000
- 2006-09 NSF grant: Controlling complex networks: Approximate linear programming techniques, \$154,000.
- Summer 2006 NSF REU supplement: A design methodology for operational flexibility, \$11,400 subcontract to Gordon College.
- 2006-07 Gordon College initiative grant: Assessing operational flexibility, \$3,000.
- Summer 2004 NSF REU supplement: Planning, coordination, and control of supply chains, \$10,000 subcontract to Gordon College.
- 2001 Gordon College grant: Workshop on mathematical modeling and complexity, \$5,000.
- 1998 Gordon College initiative grant: Flow control models, \$3,000.
- 1996-1998 MIT Leaders for Manufacturing grant: Cost of quality, \$46,000.

Professional Activity

INFORMS Committee on Teaching and Learning vice-chair, 2018-2019.

INFORMS National Meeting education cluster organizer, 2019.

Local arrangements chair, Northeast Section meeting of MAA, November 2015.

Co-organized one-day conference *Humanitarian Response: Innovation to Meet Needs*, Gordon College, March 2013.

Undergraduate operations research prize committee of INFORMS, 2013 and 2014.

NSF Proposal review panel, Operations Research program, 2008.

Organized and co-led 6-hour workshop for high school mathematics teachers, sponsored by Gordon's Division of Education and INFORMS, November, 2004.

Referee for *Operations Research*, *Mathematics of Operations Research*, *Annals of Operations Research*, *Stochastic Systems*, *IEEE Transactions on Automatic Control*, *Inst. of Industrial Engineers Transactions*, *Queueing Systems*, *European Journal of Operations Research*, *Manufacturing and Service Operations Management*, *Naval Research Logistics*, *Mathematical Programming*, *Analysis of Manufacturing Systems*, *Interfaces*.

Publications

M.H. Veatch, P. Chen, and S. Lee, Christian disaster response organizations: their approaches and networks. Submitted for publication, 2021.

M.H. Veatch, *Linear and Convex Optimization: A Mathematical Approach*. John Wiley & Sons, 2021.

M.H. Veatch, An analysis of TENZI using combinatorics and Markov chains. *Mathematics Magazine*, 94(3):173-185, 2021.

M.H. Veatch, Models, values, and disasters. *Proceedings of the 2019 ACMS Conference*, 203-213. <https://acmsonline.org/wp-content/uploads/2020/06/proceedings-2019.pdf>

M.H. Veatch and J. Goentzel, Feeding the bottleneck: airport congestion during relief operations. *Journal of Humanitarian Logistics and Supply Chain Management*, 2018. DOI: 10.1108/JHLSCM-01-2018-0006.

S. Saghafian and M. H. Veatch, A $c\mu$ rule for parallel servers with two-tiered $c\mu$ preferences. *IEEE Transactions on Automatic Control*, 61(4), 1046-1050, 2016.

M.H. Veatch. Robust performance and optimization of a series queue. Working paper, 2016.

M. H. Veatch, Approximate Linear Programming for Networks: Average Cost Bounds. *Computers and Operations Research*, 63:32-45 November 2015. DOI:10.1016/j.cor.2015.04.014.

K. Crisman and M.H. Veatch, Reinventing Heron. *The College Mathematics Journal* 45(3): 191-197, 2014.

- M. H. Veatch, Approximate Linear Programming for Average Cost MDPs. *Mathematics of Operations Research*, 38:535-544, 2013.
- M. H. Veatch and J. R. Senning, Simulation-Based Function Selection in Approximate Dynamic Programming. Working paper, 2012.
- M. H. Veatch, Performance Bounds in Queueing Networks. In J. J. Cochran, L. A. Cox, P. Keskinocak, J. P. Kharoufeh, and J. C. Smith, eds., *Wiley Encyclopedia of Operations Research and Management Science*, John Wiley & Sons, 2010.
- M. C. Russell, J. Fraser, S. Rizzo and M. H. Veatch, Comparing LP bounds for queueing networks. *IEEE Transactions on Automatic Control*, 54(11): 2703 – 2707, 2009.
- S. B. Gershwin, B. Tan and M. H. Veatch, Production control with backlog-dependent demand. *IIE Transactions*, 41(6):511 – 523, 2009.
- M.H. Veatch. The impact of customer impatience on production control. *IIE Transactions*, 41(2), 95-102, 2009.
- M. H. Veatch and J. R. Senning, Fluid analysis of an input control problem. *Queueing Systems*, 61(2), 87-112, 2009.
- C. H. Wu, M. E. Lewis and M. H. Veatch, Dynamic allocation of reconfigurable resources in a two-stage tandem queueing system with reliability considerations, *IEEE Transactions on Automatic Control*, 51(2):309 – 314, 2006.
- M. H. Veatch, Enhanced dynamic programming algorithms for series line optimization, *IEEE Transactions on Automatic Control*, 51(1): 159-164, 2006.
- M. H. Veatch and Francis de Vericourt, Zero-inventory conditions for a two-part type make-to-stock production system. *Queueing Systems* 43: 251-266, 2003.
- M. H. Veatch, Using Fluid Solutions in Dynamic Scheduling. In S. B. Gershwin, Y. Dallery, C. T. Papadopoulos, J. M. Smith, eds., *Analysis and modeling of manufacturing systems*, pp. 399-426. Kluwer, New York, 2002.
- M. H. Veatch, Fluid Analysis of Arrival Routing. *IEEE Transactions on Automatic Control* 46: 1254-1257, 2001.
- M. H. Veatch, Mathematics and Values. In *Mathematics in a Postmodern Age: A Christian Perspective*, R. W. Howell and W. J. Bradley, eds., Grand Rapids, Michigan: Eerdmans, 2001.
- M. H. Veatch, Inspection Strategies for Multistage Production Systems with Time-Varying Quality. *International Journal of Production Research* 38: 837-853, 2000.
- M. J. Yee and M. H. Veatch, Just-in-time policies for single-machine manufacturing flow controllers. *IEEE Transactions on Automatic Control* 45: 336-339, 2000.

M. H. Veatch and M.C. Caramanis, Optimal Manufacturing Flow Controllers: Zero-Inventory Policies and Control Switching Sets. *IEEE Transactions on Automatic Control* 44: 779-783, 1999.

M. H. Veatch and M.C. Caramanis, Optimal Average Cost Manufacturing Flow Controllers: Convexity and Differentiability. *IEEE Transactions on Automatic Control* 44: 914-921, 1999.

M. H. Veatch and L.M. Wein, Scheduling a Make-to-Stock Queue: Index Policies and Hedging Points. *Operations Research* 44:634-647, 1996.

M. H. Veatch and L.M. Wein, Optimal Control of a Two-Station Tandem Production/Inventory System. *Operations Research* 42:337-350, 1994.

M. H. Veatch and L.M. Wein, Monotone Control of Queueing Networks. *Queueing Systems* 12: 391-408, 1992.

M. H. Veatch and P.B. Mirchandani, Hot Job Routing Through a Stochastic Job-Shop Network. *Large Scale Systems* 11:131-148, 1986.

M. H. Veatch, Reliability of Periodic Coherent Systems. *IEEE Trans. on Reliability* R-35: 504-507, 1986.

M. H. Veatch and A.B. Calvo, SOAR-Systems Dynamic Approach to Equipment Readiness. *Budgeting for Sustainability*, J.C. Honig, ed., Military Applications Section of ORSA, pp. 211-228, 1986.

Invited Presentations

The Newsvendor Problem, Revenue Management and Market Information. Presented at Whitman College, 2019.

Three Keys to Successful Research Projects: Training, Teamwork, Timing. Presented at INFORMS conference in Phoenix, 2012.

The Spatial Distribution of Aid Recipients in Kenya. Presented at Bentley College, 2011.

Tutorial: Optimal Control of Queueing Networks. Presented at INFORMS conference in Austin, 2010.

Advising Summer Research Experiences at a Small College. Presented at INFORMS conference in San Diego, 2009.

Complexity: An information-theoretic look at nature and decisions. Gordon College Faculty Forum, 2006.

Approximate dynamic programming for networks. Presented at Boston University Center for Information and Systems Engineering seminar, 2005.

What data can't tell you: A little Fisher information theory. Alumni lecture series, Whitman College, 2004.

Using fluid solutions in dynamic scheduling. Presented at Northwestern University IEOR seminar and University of Illinois at Urbana/Champaign, 2004.

What do fluids tell us about MQNET optimality? Presented University of Rochester Simon School of Business seminar, 2000.

Fluid Models of Queueing Control Problems. Presented at Calvin College, 1999.

Fluid Models of Stochastic Control Problems. Presented at Columbia University Graduate School of Business seminar, 1999.

Beyond Mass Production: Manufacturing Competitiveness and the Role of Labor in the Information Age. Presented at Gordon College faculty forum, 1995.

Characteristics of Optimal Manufacturing Flow Controllers. Presented at Boston University Manufacturing Engineering seminar, 1994.