Golbon Zakeri

Education

UNIVERSITY OF WISCONSIN-MADISON
Ph.D. (Mathematics and Computer Sciences) awarded May 1995.

IOWA STATE UNIVERSITY
B.S.(Hons) (Mathematics) awarded Dec 1988.

Employment

2021– UMASS–AMHERST
Full Professor, Department of Mechanical and Industrial Engineering.

2019–2021 UMASS–AMHERST
Associate Professor, Department of Mechanical and Industrial Engineering.

2017–2020 UNIVERSITY OF AUCKLAND
Associate Professor, Department of Engineering Science.

2000–2017 UNIVERSITY OF AUCKLAND
Senior Lecturer, Department of Engineering Science.

SPRING SEMESTER 2012 UNIVERSITY OF CALIFORNIA BERKELEY
Visiting Professor (on sabbatical leave), Department of Industrial Engineering and Operations Research.

FALL SEMESTER 2009 UNIVERSITY OF CALIFORNIA BERKELEY
Visiting Professor (on sabbatical leave), Department of Industrial Engineering and Operations Research.

1998–2000 ARGONNE NATIONAL LABORATORY
Senior Research Associate in the Division of Mathematics and Computer Sciences.

1995–1998 UNIVERSITY OF AUCKLAND
FRST Postdoctoral Research Fellow in the Department of Engineering Science.

Awards, Honors and Leadership

- President of Operations Research Society of New Zealand 2013–2017.
- Branch chair of Auckland Chapter of the Operations Research Society of New Zealand 2009–2013.
- Director Electric Power Optimization Centre 2009–2019.
- Deputy director UoA Energy Centre 2010–2019.
- "Top 20 Teachers Award", School of Engineering, University of Auckland, 2005.
- Selected and awarded a travel grant for Association for Women in Mathematics Workshop, Math. Sciences Research Inst. Berkeley, July 1999.

- Selected and awarded a travel grant for inaugural AMS Special Session on New Doctoral Work in Mathematics, October 1994.
- "Excellence in Teaching Award", Department of Mathematics, UW-Madison, 1993.
- Dio Hall "Outstanding Senior Award", Department of Mathematics, ISU, 1988-89.
- Pi Mu Epsilon "Putnam Exam Award" for performance in the Putnam Exam, Department of Mathematics, ISU 1987-88.
- Marian Daniels scholarship, Department of Mathematics, ISU 1986-87 and 1987-88.

Recent Research Funding

- 2024-2029, Department of Energy Center, " Academic Center for Reliability and Resilience of Offshore Wind", $12.5M, Co-PI (with PI Sanjay Arwade).
- 2023-2025, funded by Sloan Foundation, "Economic and equity impacts of alternative electricity rate structures", $600,000, joint with MIT, I am the UMass PI.
- 2021-2025, funded by ISO New England, "Electricity Security through Market Based Solutions", $280,000. Sole PI.
- 2020-2025, funded by NSF's Reseach Trainee (NRT) program, "Enhancing Resiliency and Equity in Energy Transitions" $2.7 M. One of four co-PIs.
- 2020-2024 funded by NSF's Convergence Research (GCR) program, "Social and Economic Equity in Energy Transition $1.2 M, I am a Senior Personnel.
- 2016-9, Ministry for Business, Innovation and Economics' (MBIE) National Science Challenge (NSC7) Program,"Analytics of agile and resilient manufacturing" 854,442 NZD. I was **sole PI**. Completed.
- 2014-17, Transpower (Independent System Operator for New Zealand), "Risk averse investment in electricity market infrastructure", PhD Support for my student Corey Kok, 115,000NZD, I was **sole PI**. Completed.
- 2014-17, MBIE, "Large scale electrical storage", 1,800,000 NZD, **PI**, with Taylor and Sharp.
- 2013-14 and 2012-13, Coincyt (Chilean Science Foundation), "Long term planning of hydro-dominated electricity markets", 65,000 NZD, **PI** with Palma.
- 2012-13, UoA FRDF, "Hydro-electric Reservoir Optimization", 105,350 NZD **sole PI**, Postdoc support.
- 2011-13, UoA FRDF, "Economics of renewable energy", 21,926 NZD bf PI.
- 2008-11, NZ Institue for Mathematics and its Applications (NZIMA) PhD support for J.Khazaei 75,000 NZD **PI**.
- 2006-07, UoA VCUDF Masters support for Zuzhia Lee, 25,000 NZD, **PI**.
- 2000-05, NZ PGSF, "Optimization and applications", 575,000 NZD **AI**.

Journal publications – in progress

1. *On monotone completion of risk markets*, (with I. Khajepour, G.Pritchard and D. Ralph), in preparation.
2. *Modelling Optimal Investment Decisions under Renewable Uncertainty and Risk*, (with A. Khojasteh, G. Pritchard and H. Sharadga), in preparation.

Refereed journal publications – appeared

3. *Quantile Fourier regressions for decision making under uncertainty*, (with A. Khojaste and G.Pritchard), Annals of Operations Research, 2024, `https://doi.org/10`
4. *Carbon capture and co-pollutants in a networked power system*, (with P. Furlanetto, M. Ash, E. Baker, B. Diana), Environmental Research Energy, 2024, 1, 3.
5. *Weatherization and Energy Security: a Review of Recent Events in ERCOT*, (with M. Hernandez, M. Lackner, and J. F. Manwell), Current Sustainable/Renewable Energy Reports, 2022, pp.1-5.
6. *On stochastic auctions in risk-averse electricity markets with uncertain supply*, (with Ryan Cory-Wright), Operations Research Letters, 2020, 48 (3), pp. 376-384.
7. *Co-optimization of demand response and interruptible load reserve offers for a price-making major consumer*, (with M. Habibian, M. Ferris, A. Downward and M. Anjos), Energy Systems, 2020, 11 (1), pp. 45-71.
8. *Multistage stochastic demand-side management for price-making major consumers of electricity in a co-optimized energy and reserve market*, (with M. Habibian and A. Downward)European Journal of Operational Research, 2020, 280 (2), pp. 671-688.
9. *Refined experimental design and response surface methodology workflow using proxy numerical models for probabilistic geothermal resource assessment*, (with A. E. Ciriaco, W. Mannington and S. J. Zarrouk), Geothermics, 2020, 88, art. no. 101911.
10. *Geothermal resource and reserve assessment methodology: Overview, analysis and future directions*, (with A. E. Ciriaco and S. J. Zarrouk), Renewable and Sustainable Energy Reviews, 2020, 119, art. no. 109515.
11. *Payment mechanisms for electricity markets with uncertain supply*, (with Ryan Cory-Wright and Andy Philpott), Operations Research Letters, 2018, 46 (1), pp. 116-121.
12. *Pricing wind: A revenue adequate, cost recovering, uniform price auction for electricity markets with intermittent generation*, (with G. Pritchard, E. Bjorndal and M. Bjorndal), INFORMS Journal on Optimization, 2019, 1 (1), pp 35–48.

13. *Single and Multi-settlement Approaches to Market Clearing under Demand Uncertainty* (with J. Khazaei and S. Oren), Operations Research, 2017, 65 (5), pp 1147–1164.
14. *Investment and generation optimization in electricity systems with intermittent supply*, (with A. Wu and A. Philpott), Energy Systems, 2017, 8, pp 127–147, DOI: 10.1007/s12667-016-0210-z.
15. *Non-invasive test scheduling of the grid over live electricity markets*, (with S. Batstone and G. Pritchard), Interfaces 2016, 46 (6), pp 482–492, DOI 10.1287/inte.2016.0865.
16. *A column generation approach for solving generation expansion planning problems with high renewable energy penetration*, (with A. Flores-Quiroz, R. Palma-Behnke and R. Moreno), Electric Power Systems Research, 2016, 136, pp 232–241.
17. *Electricity contracting and policy choices under risk-aversion*, (with A. Downward and D. Young), European Journal of Operational Research, 2016, 251, 3, pp 846–859.
18. *Integrating consumption and reserve strategies for large consumers in electricity markets*, (with N. Cleland, G. Pritchard and B. Young), Lecture Notes in Economics and Mathematical Systems, 2016, 682, pp 23–30.
19. *Boomer Consumer - A model for load consumption and reserve offers in reserve constrained electricity markets*, (with N. Cleland, G. Pritchard and B. Young), Computational Management Science, 2015, 12, 4, pp 519–537.
20. *Correlation analysis on wind and hydro resources with electricity demand and prices in New Zealand* (with K. Suomalainen, G. Pritchard, B. Sharp, Z. Yuan) Applied Energy, 2015, 137, pp 445-462.
21. *The effects of stochastic market clearing on the cost of wind integration: a case of New Zealand electricity market* (with J. Khazaei and G. Pritchard) Energy Systems, 2014, 5, pp 657–675.
22. *Optimization of Demand Response Through Peak Shaving* (with D. Carigie, A. Philpott and M. Todd) Operations Research Letters, 2014, 42, 1, pp 97-101.
23. *Modelling counter-intuitive effects on cost and air pollution from intermittent generation* (with J. Khazaei and A. Downward), Annals of Operations Research, 2014, 222, pp 389–418.
24. *Swapping Generator Assets: Market Salvation or Wishful Thinking* (with A. Downward and D. Young), Energy Journal, 2011, 32, 2, pp 31–58.
25. *Comparison of Stochastic Programming and Bi-objective Optimisation Approaches to Robust Airline Crew Scheduling* (with B. Tam, M. Ehrgott, D. Ryan), OR Spectrum 2011, 33, 1, pp 49 – 75.
26. *Production inefficiency of electricity markets with hydro generation* (with A. Philpott, J. Khazaei, Z. Guan), Utilities Policy, 2010, 18, 4, pp 174–185.
27. *On Cournot Equilibria in Electricity Transmission Networks* (with A. Downward and A. Philpott), Operations Research, 2010, 58, pp 1194–1209.

28. *A single settlement energy-only electric power market for unpredictable and intermittent participants* (with G. Pritchard and A. Philpott), Operations Research, 2010, 58, pp 1210–1219.
29. *Welfare effects of expansion in equilibrium models of an electricity market with fuel network* (with S. Ryan, A. Downward, A. Philpott), IEEE Transactions in Power Systems, 2010, 25, 3, 1337–1349.
30. *Non-parametric Estimation of Market Distribution Functions in Electricity Pool Markets* (with A. Philpott and G. Pritchard), Mathematics of Operations Research, 2006, 31, 3, pp 621–636.
31. *Market Offering Strategies for Hydroelectric Generators* (with G. Pritchard), Operations Research, 2003, 51, 4, pp 602–612.
32. *Inexact Cuts in Benders' Decomposition* (with A. Philpott and D. Ryan), SIAM Journal on Optimization, 2000, 10, pp 643–657.
33. *Multicoordination Methods for the Solution of Convex Block-angular Programs*, (with R. R. Meyer), SIAM Journal on Optimization 1999, 10, pp 121–131.
34. *Upper Bounds for Gaussian Stochastic Programs* (with G. Pritchard), Mathematical Programming 86, 1999, pp 51–63.
35. *Compound Constructions of Minimal Broadcast Networks* (with M. J. Dinneen, J. A. Ventura and M. Wilson), Discrete Applied Math. 1999, 93, pp 205–232.
36. *Construction of Time-Relaxed Minimal Broadcast Networks* (with M. J. Dinneen, J. A. Ventura and M. Wilson), Parallel Processing Letters 9, 1999, pp 53–68.
37. *Coordination in Coarse Grained Decomposition*, (with R. De Leone, R. R. Meyer, S. Kontogiorgis and A. Zakarian), SIAM Journal on Optimization, 1994, 4, pp 777-793.

Invited refereed book chapters

38. *A review of simulation usage in the New Zealand electricity market*, (with G. Pritchard), Springer Proceedings in Mathematics and Statistics, 2018, 231, pp. 23-37.
39. *Market Clearing Mechanisms for Efficiently Incorporating Renewable Energy and Mitigating CO2*, for Handbook of Power Systems: CO2, Zheng, Q.P.; Rebennack, S.; Pardalos, P.M.; Pereira, M.V.F.; Iliadis, N.A. (Eds.)(sole author).
40. *Utilization of optimization for wholesale electricity market generators* Encyclopedia of ORMS, available online. (Submission was by invitation only; 3 anonymous referees).

Conference papers (refereed by at least 2 anonymous referees)

41. *Potential Impact of Climate Change on the New Zealand Electricity Market*, (with G. Pritchard, L. Moniotte, L. Shanker), Proceedings of the 53rd Hawaii International Conference on System Science 2020, pp 3148–3155. DOI:10.24251/HICSS.2020.383.
42. *Reserve constraints in electricity markets effects on large scale integrated consumers* (with N. Cleland and B. Young), Proceedings of IEEE Innovative Smart Grid Technologies (ISGT) 2014.
43. *Integrating Consumption and Reserve Strategies for Large Consumers in Electricity Markets* (with N. Cleland and B. Young) Computational Management Science 2014.
44. *Splines as an Optimization Tool in Petroleum Engineering* (with R. Archer and T. Vaudrey), Proceedings of the Society of Petroleum Engineers Annual Conference, 2005.
45. *Importance Sampling in Stochastic Programming* (with G. Pritchard), Proceeding of the Hungarian Limit Theorems conference, 2000.

Volumes edited

46. *Proceedings of the 42nd Annual Conference of the Operations Research Society of New Zealand*, November 2007.

Submissions to government and commissioned reports
Non-confidential reports are available from `epoc.org.nz`

47. *Analytics of Electricity Peak Pricing* (with G. Pritchard), Report commissioned by New Zealand Steel, 2014. (13 pages)
48. *Transmission Pricing Methodology, Issues and Proposal* (with A. Philpott, A. Downward and G. Pritchard), Submission to the Electricity Authority by Electric Power Optimization Centre, 2012. (6 pages)
49. *Consultation Document: FTR Code Amendments* (with A. Philpott, A. Downward and G. Pritchard), Submission to the Electricity Authority by Electric Power Optimization Centre, 2012. (4 pages)
50. *Managing locational price risk* (with A. Philpott, G. Pritchard), Submission to the Electricity Authority by Electric Power Optimization Centre, 2011. (7 pages)
51. *Scarcity Pricing - Proposed Design* (with A. Philpott, G. Pritchard), Submission to the Electricity Authority by Electric Power Optimization Centre, 2011. (7 pages)
52. *Decision Analysis Assisted Contracting*, Commissioned report for Mighty River Power, 2011. (8 pages)
53. *A Literature Survey of Financial Transmission Rights Auctions*, (with A. Downward), Commissioned report for Mighty River Power, 2010. (31 pages)

54. *Exploring the strategic behaviour of FTR holders with market power*, (with A. Downward), Commissioned report for Mighty River Power, 2010. (53 pages)
55. *Submission on Electricity Industry Bill*, (with A. Philpott and the Energy Centre), Submission to the Electricity Authority, 2010. (4 pages)
56. *Effects of proposed real and virtual asset swaps on the NZEM*, (with A. Downward and D. Young), Commissioned report for the Electricity Commission, 2010. (15 pages)
57. *Consultation paper: High Spring Washer Pricing*, (with A. Philpott and G. Pritchard), Submission to the Electricity Commission, 2006. (10 pages)
58. *Submission on Centralised Dataset Additions*, (with A. Philpott and G. Pritchard), Submission to the Electricity Commission, 2006. (1 page)
59. *Centralised Dataset*, (with A. Philpott and G. Pritchard), Submission to the Electricity Commission, 2005. (1 page)
60. *Review of Assessment for Reserve Energy Requirements*, (with A. Philpott and G. Pritchard), Submission to the Electricity Commission, 2004. (5 pages)
61. *Submission on Draft Grid Investment Test*, (with A. Philpott and G. Pritchard), Submission to the Electricity Commission, 2004. (3 pages)
62. *Submission on Reserve Generation Policy Proposal*, (with A. Philpott and G. Pritchard), Submission to the Electricity Commission, 2003. (15 pages)

Full conference papers; not refereed

63. *Cost-Recovering, Revenue-Adequate Single Settlement Schemes for Electricity Markets*, Proceedings of the 50th annual conference of the ORSNZ, (with R. Cory-Wright and A. Philpott), full paper available online, 2016.
64. *Binary Interruptible Load Optimisation*, Proceedings of the 47th annual conference of the ORSNZ, (with J. Dunn and A. Downward), full paper available online, 2013.
65. *Use of Hydro Resources for Irrigation and Electricity Production*, Proceedings of the 46th annual conference of the ORSNZ, (with A. Downward, Z. Farishta and F. Wahid), pp 98-108, 2012.
66. *Simulating FTR Strategy in New Zealand Electricity Market*, Proceedings of the 46th annual conference of the ORSNZ, (with M. Leon and A. Downward), pp 176-184, 2012.
67. *Financial Transmission Rights Auctions: Entry and Efficiency*, Proceedings of the 45th annual conference of the ORSNZ, (with A. Downward), pp 400 408, 2010.
68. *Inexact Cuts in Stochastic Benders Decomposition*, Proceedings of the 32nd annual conference of the ORSNZ, (with A. Philpott and D. Ryan) 1996.

69. *Techniques for Solving Large-scale Set Partitioning Problems*, Proceedings of the 32nd annual conference of the ORSNZ, (with A. Philpott and D. Ryan) 1996.

Postdoctoral research fellows mentored

- Dr. Jonathan Pearce joined UMass Amherst in 2024. His work entails enhancement to the electricity simulator that captures ISO New England. We are also working on agent based simulation models for this market.
- Dr. Hussein Sharadga joined UMass Amherst in 2022. His research centers on investment in electricity generation under uncertainty and risk.
- Dr. Mohsen Mohammadi-Dehcheshmeh joined UMass Amherst 2021. He worked with me and developed a simulator for the ISO New England electricity market. This simulator is extensively used in research related to the two NSF grants of 2020-2025 (currently in progress) and in teaching.
- Dr. Kiti Suomalainen joined the UoA Energy Centre in 2013. I set up joint works with Kiti and provided direction for her. We have one appeared publication in Applied Energy thus far and one more in progress.
- Dr. David Young joined the UoA Energy Centre in 2009. He was a fresh PhD from Caltech. Although very bright, he needed direction and had to come up to speed with New Zealand energy issues. I took it upon myself to mentor David. Our joint research resulted in the paper Swapping Generator Assets: Market Salvation or Wishful Thinking published in the Energy Journal 2011.
- In 2009/2010 I procured funding from the UoA Energy Centre to partly fund a postdoctoral fellowship for Tony Downward, who was about to finish his PhD. I then put together a FRDF application to jointly (with the Energy Centre) support Tony for 2 years of postdoctoral fellowship. This was a successful application and I mentored Tony through his postdoc. Together we have published 7 journal papers. Tony is now an academic at the university of Auckland.

PhD students

1. Iman Khajepourtadvani 2023 – *On Monotone Completion of Risk Markets.*
2. Ryan Ent 2021 – *Electricity Security through Market Based Solutions: A Full Spectrum Analysis.* Ryan is supported by my ISO New England grant.
3. Arash Khojasteh 2021 – *Optimal backup for robust integration of wind power into the ISO-New England electricity market.*
4. Paola Furnaletto 2019 – *Energy access, pollution and equity.* (joint with Erin Baker.)
5. Mahbubeh Habibian 2014 – 2019 *Sector-wide Effects of Demand Response in Deregulated Electricity Markets.* Mahbubeh took up senior software engineer and team leader at Merlot Aero, NZ.
6. Regan Baucke 2015 – 2019 *Contracting and risk over electricity markets.* Regan is a postdoctoral Research fellow at Ecole des Ponts ParisTech.

7. Corey Kok 2014 – 2018 *Electricity generation investment models under risk.* **Following a postdoctoral research fellowship at DTU, Corey is currently employed at the NZ Electricity Authority**.
8. Milad Maralani 2013 – 2018 *Computational general equilibrium for New Zealand economy with emphasis on the energy sector.* (Joint with Basil Sharp, Economics). Milad is an Economist at the New Zealand Institute of Economic Research (NZIER).
9. Yue Wang completed 2016 – 2018, *Computational general equilibrium in electricity and agriculture*. (joint with Steve Poletti and Basil Sharp (both Economics), I was the math modelling supervisor). Yue (Bonnie), took up a postdoctoral fellowship at Hong Kong University immediately after graduation.
10. Nigel Cleland completed 2015. *Systems view of NZEM with emphasis on reserve*. (joint with Brent Young (Chemical and Materials Engineering), I was the main supervisor). Nigel is now a corporate finance and wholesale pricing analyst at AGL Energy, Australia.
11. Athena (Tianran) Wu completed 2014. *Expansion Models and Investment Decisions in Electricity Systems with Renewable-induced Uncertainties.* (joint supervision with Andy Philpott). Athena is now a corporate finance analyst at Mercury, New Zealand.
12. Javad Khazaei 2008-12.*Mechanism design for electricity markets under uncertainty.* (Main supervisor, joint with Geoff Pritchard). **Javad started a postdoctoral fellowship at Princeton University immediately after graduation and is currently the Director of Data Science at EDF Renewables San Diego**.
13. Tony Downward 2006-11. *Strategic behaviour in electricity markets.* (Main supervisor, joint with Andy Philpott). **Tony is now an academic, University of Auckland**.
14. Man Bao Bassy Tam 2006-11. *Optimisation approaches for robust airline crew scheduling.* (joint with Matthias Ehrgott and David Ryan, M. Ehrgott the primary supervisor).

Masters students

1. Roby Hermawan 2015 *Optimization of Electricity Network in South Sulawesi for Long-term Scenario Using Linear Programming,* (sole supervisor).
2. Samantha Goodhue 2013 *Demand-side Participation Analysis of a Large Consumer in the New Zealand Electricity Market,* (sole supervisor).
3. Nick Porter 2013 *Short Term Efficiency of Hydro-dominated Electricity Markets,* (jointly supervised with Andy Philpott).
4. Damien Sunny 2013 *On Electricity Dispatch for Papua New Guinea,* (sole supervisor).
5. Michael Leon 2013 *A Financial Transmission Rights Simulator for the NZEM,* (joint with Tony Downward, I was the main supervisor).

6. Alexander Wilson 2011 *Optimal electricity distribution tariff design,* (sole supervisor).
7. Gary Nates 2010 *Generator Energy Nodal Offering Model,* (joint with Andy Philpott).
8. Vitesh Bava 2008 *Pricing Energy Dispatch and Reserve Optimization Software,* (joint with Andy Philpott, I was the main supervisor, funded by Contact Energy).
9. Nicholas DuPont 2008 *Clutha Hydro-electric River Chain Optimization,* (joint with Andy Philpott, funded by Contact Energy).
10. David Craigie 2007 *Optimization of demand-side electricity generation,* (joint with Andy Philpott, I was the main supervisor).
11. Owen Auger 2007 *Estimating productive efficiency of the New Zealand wholesale electricity market,* (joint with Andy Philpott).
12. Zhouxia Li 2006 *Exploring the diamond cutting problem,* (joint with Mike O'Sullivan Jr and Cameron Walker, I was the main supervisor, funded by VCUDF).
13. Alvis Chen 2005 *Comparing Multicriteria and Stochastic Programming Models for Robust Crew Scheduling,* (joint with Matthias Ehrgott).
14. Asher Treby 2005 *Routing Trains Through a Rail Network using Simulation,* (sole supervisor).
15. Pei-Teh Hu 2002 *Single reservoir long-term hydro scheduling in an electricity pool market,* (joint with Andy Philpott).
16. Hye Jin Park 2002 *Capacity expansion in a paper industry,* (sole supervisor).

Honours projects supervised

1. Joshua Dawes (2015), Investigating the Impact of EV uptake on electricity prices in New Zealand.
2. Jamie Chow (2015), Analytics of congestion in electricity systems.
3. Regan Baucke (2014), Risk Aversion and Forward Markets.
4. Corey Kok (2014), Equilibrium models for investment in electricity markets with risk.
5. Brendan Speakman (2014), Optimization of reserve procurement under uncertainty.
6. Jack Dunn (2013), Integer optimization of interruptible load.
7. Jennifer McLean (2013), Optimal maintenance of transmission towers.
8. Yibo Wang (2013), Optimal offer strategies across multiple nodes.
9. Nick Porter (2012), Head effects from lake levels.
10. Salah Alchanti (2012), Swap contracts over electricity markets.

11. Y Thai (2012), Optimal Diamond Cutting.
12. Zabin Farishta (2011), Value of water for agricultural use under deregulation.
13. Faisal Wahid (2011), What might happen in the Tekapo A and B transfer.
14. Vessie Pencheva (2010), Effects of the Asset Swaps on the NZEM Prices.
15. Jason Undan (2010), Optimisation of Demand-Side Bidding.
16. Alex John (2010), A Comparison of Two Network Simplifications for the NZEM.
17. Kailin Lee (2008), Water valuation.
18. Xian Qu (2007), Stochastic market clearing mechanism.
19. T Wong (2007), Computing the effects of line expansion.
20. Graham Connell (2006), Well Placement Optimization.
21. Sneha Anthony (2006), Revenue management for lines companies.
22. Anthony Downward (2005), Offer optimization for Southdown station.
23. David Craigie (2005), Stochastic dominance in portfolio optimization.
24. Bradly Hyland (2003), Financial portfolio optimization.
25. Jacque Bassili (2003), Optimal maintenance induced shut down scheduling.
26. Ambili Viswambaharan (2002), Optimization of diamond cutting.
27. P Kan (2002), Multi-nodal market distribution functions.
28. Helen Huang (2002), Verification of estimation methods for market distribution functions.
29. Oliver Woo (2001).
30. Jaishika Prasad (2001).
31. Y Chang (2000), An objective function for racing yacht design.
32. Hye Jin Park (2000), Forest harvest storage under uncertainty.

Student prizes

- Ryan Cory-Wright, (2017), Young Practitioner Award, first place, "Market design for renewable generation".
- Ambili Wiswambaharan, (2002), Young Practitioner Award, first place, "Optimal diamond cutting".
- Tony Downward, (2016), Young Practitioner Award, second place, "Equilibria in electricity markets with transmission constraints."
- Jason Undon, (2015), Young Practitioner Award, second place, "Market distribution function for consumers".
- David Cragie, (2014), Young Practitioner Award, second place, "Electricity demand response".

Thesis examination and committee service

- (at UMass) Rodrigo Mercado, 2020, Thesis committee member.
- (at UMass) Franklyn Kanyako, 2020, Thesis committee member.
- (at UMass) Paola Furnaletto, 2020, Thesis committee member.
- (at UMass) Management Science Department Qualifying Exam committee member, 2020.
- (at UoA) Examiner for Masters thesis: Marie Marconnet (Economics, Victoria University of Wellington, 2007).
- (at UoA) Assessor for Masters thesis: Kim Frew (2011).
- (at UoA) Examiner for PhD thesis: Antonio Pinto (supervised by J.F. Raffensperger , University of Canterbury, 2012)
- (at UoA) PhD oral exam chair: Masoud Khosravani(ComputerScience,2011).
- (at UoA) PhD oral exam chair: Heti Afimeimounga(Statistics,2011).
- (at UoA) PhD oral exam chair: Helen Huang(Economics,2011).
- PhD oral exam committee: Olga Perederieieva (Engineering Science, 2014).
- Examiner for PhD thesis: Peter Jackson (Supervised by Grant Read and Shayne Dye, University of Canterbury, 2014).

Course development and course direction

- 2020 (at UMass), I have reconfigured MIE 379 entirely to a modernized course in Operations Research and Data Analytics using Python (used with jupyter notebooks, and stand alone), in conjunction with the optimization solver Gurobi, which is a modern industry standard optimization solver free to academia.
- 2020 (at UMass), I have developed a six week short course on "Prescriptive analytics using Python-Gurobi" that can be offered in summer school.
- 2020 (at UMass), I am developing a new course that will serve as *the core course* for the recently awarded NRT and GCR grants we have received. This course will be offered in Fall 2021 and will be based on an electricity matket simulator that will capture the New England electricity market (mini-ISONE). This is my core area of expertise and this course will underpin both research and traineeship for both of the aforementioned large proposals.
- 2011 (at University of Auckland (UoA)) ENERGY 721. This course is a multi-disciplinary course that brings together students from Economics and Engineering. I developed 1/4 of the material for the course. I organized and directed the course in 2011 and 2012. The course was very successful, evidenced by the large and growing increase in enrollment (from 15 (in 2011) to nearly 50 (in 2013)). Students find the electricity section (my section) especially interesting, stimulating and useful.

- 2006 (at UoA), ENGSCI 213. This course presents mathematical modelling to software engineering (SE) students. I developed this course and I strove to cater to the future needs of SE students. I met with colleagues in SE, and with successful practising local software engineers O'Callahan (CEO Mozilla NZ) and Milich (IBM) to help determine the mathematical modelling needs of graduates.
- 2005 (at UoA) ENGSCI 763. I developed from scratch an entire course on simulation and comprehensive notes for this course. Coupled with this set of notes are 8 sets of tutorials.
- (at UoA) Course development ENGSCI 760. I developed learning outcomes and new coherent, condensed lecture notes that outline the topic of planning under uncertainty for a general engineer without expertise in operations research. My younger colleagues who have found them indispensable (Tony Downward 2013).
- (at UoA) Course direction Eng Sci 768. Traditionally OR students learn about optimization. To introduce analytics of market interactions I initiated equilibrium programming within Eng Sci 768. This was warmly received by students, and the topic has been retained in subsequent years by other lecturers, who have given positive feedback on my materials.
- (at UoA) I have been course coordinator for ENGSCI 311 (Math Modelling 3), which has over 400 students from across the faculty, since 2012. The course has progressed smoothly and the students have been very happy with the organization of the course (see rating from Deans Survey 2012). I initiated lecture recordings for this course, which was particularly well received by the students.

Courses taught

- (at UMass) MIE 623, "Prescriptive Analytics with Python-Gurobi".
- (at UMass) MIE 620, "Linear Programming".
- (at UMass) MIE 379, "Operations Research I".
- (at UMass) MIE 532, "Network Optimization".
- (at UoA) Energy 721, "Energy resources".
- (at UoA) EngSci 768, "Nonlinear Programming and Game Theory".
- (at UoA) EngSci 763, "Simulation and Stochastic Programming".
- (at UoA) EngSci 760, "Decision Making Under Uncertainty and Dynamic Programming".
- (at UoA) EngSci 712, "Linear Algebra for Signal Processing".
- (at UoA) EngSci 391, "Deterministic Operations Research".
- (at UoA) EngSci 311, "Mathematical Modelling III".
- (at UoA) EngSci 211, "Mathematical Modelling II".

- (at UoA) EngSci 213, “Mathematical Modelling for Software Engineers”.
- (at UoA) EngSci 131, “Engineering Computation”.

Editorial service and professional leadership

- Area Editor for the Energy and Environment Area of Operations Research 2024 –.
- Inaugural Editor for the INFORMS-Springer Book Collection, 2022–.
- Computational Management Science, Associate Editor 2020–.
- Operations Research, Guest Editor for the special issue on “Computational advances in short-term power system operations”. (Note: OR is the flagship journal of our field).
- Member of Scientific Committee, International Symposium on Mathematical Programming, July 2024.
- IET, Renewable Power Generation, Associate Editor, 2020–2024.
- Energy and Natural Resources section of INFORMS, Committee Chair for Best Publication in Energy, 2019, 2020.
- Energy and Natural Resources section of INFORMS, committee member for Best Publication in Energy, 2018.
- Director Electric Power Optimization Centre.
- Deputy Director Energy Centre, Department of Economics, UoA.
- Energy Systems cluster chair for International INFORMS, June 2016.

List of invited (fully funded) plenaries

- ANZIAM annual conference, Adelaide, Australia, 2024;
- International Winter School in Stochastic Programming, Geilo, Norway, 2022 (funded by SINTEF);
- International Winter School in Stochastic Programming, Passo Del Tonale, Italy, 2017 (funded by SINTEF);
- ENEC2016 Optimization and Equilibrium in Energy Economics, IPAM, UCLA, 2016 (funded by IPAM);
- International Winter School in Stochastic Programming, Oppdal, Norway, 2016 (funded by SINTEF);
- SVAN2016 Analysis and Applications of Stochastic Systems, IMPA, Rio de Janeiro 2016 (funded by IMPA);
- Universidad de Chile Energy Centre, 2015, 2013 and 2012 (funded by UC);
- Fondation mathematique Jacques Hadamard Conference on Optimization (PGMO-COPI) 2014 Paris (funded by Electricite de France);

- Sharif University Energy Department 2011 (funded by Sharif);
- New Directions in Energy Economics UC Louvain 2010 (funded by UCL).

Consulting Fonterra (2002), Electricity Commission (2009), Mighty River Power (2010, 2011), Transpower (2012), NZ Steel (2013, 2014), Genesis Energy (2016), Chilean System Operator (2019).