Rafid Mahmood

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Mechanical and Industrial Engineering
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Education

University of Toronto, Mechanical and Industrial Engineering

Ph.D Industrial Engineering (Operations Research), 2015–2020.
Advisor: Professor Timothy C. Y. Chan
Vector Postgraduate Affiliate, 2019-2020
Prospective Professors in Training Program, 2019
Vector Institute Deep Learning Reinforcement Learning (DLRL) Summer School, 2018

University of Toronto, Electrical and Computer Engineering

M.A.Sc. Electrical Engineering, 2013–2015.
Advisor: Professor Ashish Khisti
Thesis: Rank metric convolution codes with applications in network streaming
IEEE North American School on Information Theory (NASIT), 2014

B.A.Sc. Electrical Engineering, 2008–2013.
Graduated with Honours

Publications

In Preparation

1. A. Babier, A. Diamant, T. C. Y. Chan, and **R. Mahmood**, Interior Point Methods with Adversarial Networks.

Under Review

1. **A. Babier**, R. Mahmood, A. McNiven, A. Diamant, and T. C. Y. Chan, Knowledge-based automated treatment planning with three-dimensional generative adversarial networks, *major revision at Medical Physics*, 2018.

2. T. C. Y. Chan, T. Lee, **R. Mahmood**, and D. Terekhov, Multiple observations and goodness of fit in generalized inverse optimization, *major revision at Operations Research*, 2018.
Honorable Mention at CORS 2018 Best Student Paper Competition: Open Category.

Journal Articles

1. **R. Mahmood**, A. Badr, and A. Khisti, Streaming Codes for Multiplicative-Matrix Channels with Burst Rank Loss, *IEEE Transactions on Information Theory*, 64(7), 5296–5311, 2018.

2. **R. Mahmood**, A. Badr, and A. Khisti, Convolutional Codes with Maximum Column Sum Rank for Network Streaming, *IEEE Transactions on Information Theory*, 62(6), 3039–3052, 2016.

Conference Proceedings

1. **R. Mahmood**, A. Babier, A. McNiven, A. Diamant, and T. C. Y. Chan, Automated Treatment Planning in Radiation Therapy with Generative Adversarial Networks, *Proceedings of Machine Learning for Health Care*, 484–499, 2018.
2. **R. Mahmood**, A. Badr, and A. Khisti, Low delay network streaming under burst losses, *IEEE International Symposium on Information Theory*, 2898–2902, 2016.
3. **R. Mahmood**, A. Badr, and A. Khisti, Convolutional Codes with Maximum Column Sum Rank for Network Streaming, *IEEE International Symposium on Information Theory*, 2271–2275, 2015.
4. **A. Badr**, R. Mahmood, and A. Khisti, Embedded MDS Codes for Multicast Streaming, *IEEE International Symposium on Information Theory*, 2276–2280, 2015.

Workshop Papers

1. **A. Babier**, **R. Mahmood**, A. McNiven, A. Diamant, and T. C. Y. Chan, Automated Treatment Planning in Radiation Therapy with 3-D Generative Adversarial Networks, *NeurIPS Workshop on Machine Learning for Health*, 2018.

Teaching Assistantships

MIE 465: Analytics in Action, 2017–2019
This is a case-study course on analytics (e.g., predictive, prescriptive, and descriptive) for 3rd and 4th year undergraduates. I created course content, including laboratory assignments and quizzes, and managed student groups on their course projects.

MIE 1620: Linear Programming and Network Flows, 2018
This is a graduate-level course on the theory of linear programming. I designed and marked assignments and exams.

MIE 258: Engineering Economics and Accounting, 2016–2017
This is a course on accounting, economics, and financial analysis for 2nd and 3rd year undergraduates. I held tutorials and designed and marked assignments and exams.

ECE 363: Communication Systems, 2015
This is an introductory course on analog and digital communication systems for 3rd year undergraduates. I held tutorials and designed and marked assignments and exams.

Students Supervised

1. Richard Chavez, Sliding Window Generative Adversarial Networks for Radiation Therapy, *Industrial Engineering 4th Year Thesis*, 2019.
   Co-supervised with Aaron Babier
2. Michael Shin, Using Portfolio Theory to Optimize Selection of Daily Fantasy Basketball Contests, *Engineering Science 4th Year Thesis*, 2018.
   Co-supervised with Ben Potter
3. Yusuf Shalaby, Inverse Optimization for Measuring Cancer Treatment Pathway Concordance, *Industrial Engineering 4th Year Thesis*, 2018.

4. Palmira Pereira, Netflix Prize Problem Using Inverse Optimization, *Masters of Engineering Thesis*, 2017.

Awards

1. Postgraduate Affiliate Program, Vector Institute, 2019. ($6 000)
2. Student Paper Competition: Open Category Honourable Mention, CORS Annual Conference, 2018. ($100)
3. Postgraduate Doctoral Scholarship, NSERC, 2017. ($42 000)
4. First Place, Waterfront International Ltd. Quantathon, 2016. ($7 500)

Presentations

1. INFORMS Health Care, Boston, MA, USA, 2019
2. CORS Annual Conference, Saskatoon, SK, Canada, 2019
   Also served as a session chair.
3. Machine Learning for Health Care, Stanford, CA, USA, 2018
4. CORS Annual Conference, Halifax, NS, Canada 2018
5. INFORMS Annual Meeting, Houston, TX, USA, 2017
6. CORS Annual Conference, Quebec City, QC, Canada, 2017
7. INFORMS Annual Meeting, Nashville, TN, USA, 2016
8. IEEE International Symposium on Information Theory, Hong Kong, HK, China, 2015

Personal

Languages: English (fluent), French (beginner)

Citizenship: Canadian

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