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 Institute 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

Articles for operations research journals use alphabetical author ordering. * denotes the primary author.

In Preparation

1. A. Babier, T. C. Y. Chan, A. Diamant, 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. A. Babier, T. C. Y. Chan, T. Lee, **R. Mahmood***, and D. Terekhov, A Unified Framework for Model Fitting and Evaluation in Inverse Linear Optimization, *major revision at Operations Research*, 2019.

   Previously titled Multiple observations and goodness of fit in generalized inverse optimization. Won 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, T. C. Y. Chan, T. Lee, **R. Mahmood***, and D. Terekhov, Model Fitting in Generalized Inverse Linear Optimization: Applications in Radiation Therapy, *Canadian Healthcare Optimization Workshop*, 2019.
   Workshop version of A Unified Framework for Model Fitting and Evaluation in Inverse Linear Optimization.
2. 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.
   Workshop version of Knowledge-based automated treatment planning with three-dimensional generative adversarial networks.

Clinical Abstracts

1. A. Babier*, **R. Mahmood**, A. McNiven, and T. C. Y. Chan, An Optimization Method for Knowledge-based Automated Planning that Leverages Ensemble Dose Predictions, *American Association of Physicists in Medicine*, 2019.
2. A. Babier*, **R. Mahmood**, A. McNiven, and T. C. Y. Chan, Comparing Deep Learning Architectures for Knowledge-Based Automated Planning, *American Association of Physicists in Medicine*, 2019.

Presentations

1. Interior Point Methods with Adversarial Networks
   (a) INFORMS Annual Meeting, Seattle, WA, 2019 *(Scheduled)*.
   (b) CORS Annual Conference, Saskatoon, SK, Canada, 2019 *(Scheduled)*.
2. A Unified Framework for Model Fitting and Evaluation in Inverse Linear Optimization

(a) INFORMS Health Care, Boston, MA, USA, 2019 *(Scheduled)*.
(b) Canadian Healthcare Optimization Workshop, Saskatoon, SK, Canada, 2019 *(Scheduled)*.
(c) CORS Annual Conference, Halifax, NS, Canada, 2018.
(d) INFORMS Annual Meeting, Houston, TX, USA, 2017.
(e) CORS Annual Conference, Quebec City, QC, Canada, 2017.
(f) INFORMS Annual Meeting, Nashville, TN, USA, 2016.

3. Automated Treatment Planning in Radiation Therapy with Generative Adversarial Networks
   (a) CORS Annual Conference, Saskatoon, SK, Canada, 2019 *(Scheduled)*.
   (b) MLHC Conference, Palo Alto, CA, USA, 2018.
4. Convolutional Codes with Maximum Column Sum Rank for Network Streaming
   (a) IEEE International Symposium on Information Theory, Hong Kong, HK, China, 2015.

Teaching Assistantships

MIE 465: Analytics in Action	2017–2019
MIE 1620: Linear Programming and Network Flows	2018
MIE 258: Engineering Economics and Accounting	2016–2017
ECE 363: Communication Systems	2015

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.
   Co-supervised with Nasrin Youssefi
4. Palmira Pereira, Netflix Prize Problem Using Inverse Optimization, *Masters of Engineering Thesis*, 2017.

Awards

1. Postgraduate Affiliate Program, Vector Institute, 2019 ($12 000)
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)

Personal

Languages: English (fluent), French (beginner)

Citizenship: Canadian

Last updated: May 3, 2019
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