

**Borzou Rostami**

## Curriculum Vitae

### Academic Employment

- Jul. 2022 – **Alberta School of Business, University of Alberta, Edmonton, AB, Canada.**  
Assistant Professor and CPA Chair in Business Analytics
- Jul. 2019 – **Lazaridis School of Business & Economic, Wilfrid Laurier University, Waterloo, ON, Canada.**  
Jun. 2022  
Assistant Professor of Operations and Decision Sciences
- Oct. 2017– **Canada Excellence Research Chair in Data Science for Real-Time Decision-Making, CIRRELT, and GERAD, Polytechnique Montreal, Montreal, QC, Canada.**  
June 2019  
Postdoctoral researcher
- Oct. 2016– **École de technologie supérieure, CIRRELT, and GERAD, Montreal, QC, Canada.**  
Sept. 2017  
Postdoctoral researcher
- Oct. 2014– **TU Dortmund University, Dortmund, Germany.**  
Sept. 2016  
Postdoctoral researcher
- 2006– 2010 **University of Kurdistan, Sanandaj, Iran.**  
Faculty Member and Lecturer in the Department of Mathematics

### Education

- 2011– 2014 **Polytechnic University of Milan, Milan, Italy.**  
Ph.D. in Information and Technology (major: supply chain analytics, minor: recommender systems)
- Jan 2013– **Clemson University, Clemson, SC, USA.**  
August 2013  
Visiting scholar
- 2003– 2006 **University of Kurdistan, Sanandaj, Iran.**  
M.S. in Operations Research
- 1999– 2003 **University of Kurdistan, Sanandaj, Iran.**  
B.S. in Applied Mathematics

### Research Interests

- Supply chain and retails analytics and optimization
- Network design
- Transportation and logistics
- Large-scale optimization
- Smart cities
- Data-driven decision making
- Machine learning applied to real-time decision making
- Integration of machine learning and optimization

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## Grants

- 2022-2024 Insight Development Grant (IDG), Social Sciences and Humanities Research Council of Canada (\$71,800), “ Post-Pandemic Shelf Space Planning in Physical Retailing”, Principal Applicant.
- 2020-2025 NSERC discovery grant, Natural Sciences and Engineering Research Council of Canada (\$130,000), “ discrete optimization under interactions and uncertainty”, Principal Applicant.
- 2020-2025 NSERC - Discovery Launch Supplement, Natural Sciences and Engineering Research Council of Canada (\$12,500), Principal Applicant.
- 2020-2021 CN (Canadian National Railway) through the Centre for Supply Chain Management at Wilfrid Laurier University (\$9,405), “drone delivery in smart cities: applications and challenges”, Principal Applicant.
- 2021-2022 CN (Canadian National Railway) through the Centre for Supply Chain Management at Wilfrid Laurier University (\$8,835), “data-driven approaches to analyze coopetition and supply chain relationships”, Principal Applicant.
- 2021-2022 CN (Canadian National Railway) through the Centre for Supply Chain Management at Wilfrid Laurier University (\$6,166), “improving store-wide shelf space planning in physical retailing”, Principal Applicant.
- 2016-2017 Internationalization Research Fund (Fonds d'internationalisation de la recherche (FIR), École de technologie supérieure - ÉTS (\$30,000), “route planning with stochastic and correlated data”, Co-applicant.
- 2015-2018 German Research Foundation (Deutsche Forschungsgemeinschaft DFG) (\$385,800), “hub location problems under data uncertainty”, Collaborator.

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## Publications

### Forthcoming

- [1] A dual bounding framework through cost splitting for binary quadratic optimization, with M. Bayani, L.M. Rousseau, and Y. Adulyasak, **INFORMS Journal on Computing** (accepted), 2023.

### Published Papers

- [1] Attractiveness factors in retail category space location/allocation problem, with S. Babaei, A. Araghi, and I. Castillo, **International Journal of Production Research** **61(16)**, Pp 5566 – 5584, 2023.
- [2] A convex reformulation and an outer approximation for a class of quadratic binary programming, with A. Lodi, and F. Errico, **Operations Research**, 71(2), Pp 471-486, 2023.
- [3] Coordinating transportation and pricing policies for perishable products, with S. Babaei, and M. Araghi, **Transportation Research Part B** **164**, Pp 105–125, 2022.
- [4] The price of anarchy in freight transportation spot markets, with M. Houghton, and S. Espahbod, **EURO Journal on Transportation and Logistics**, 24:100071, 2022.
- [5] Single-allocation hub location with heterogeneous economies of scale, with O. Arslan, M. Chitsaz, G. Laporte and A. Lodi, **Operations Research** **70(2)**, Pp 766 – 785, 2022.
- [6] Branch-price-and-cut algorithms for the vehicle routing problem with stochastic and correlated travel times, with G. Desaulniers, F. Errico, A. Lodi, **Operations Research** **69(2)**, Pp 436 – 455, 2021.

- [7] Stochastic single-allocation hub location, with N. Kämmerling, C. Buchheim, J. Naoum-Sawaya, and U. Clausen, ***European Journal of Operational Research* 289 (3)**, Pp 1087–1106, 2021.
- [8] Reliable uncapacitated single allocation hub location problem under hub breakdowns, with N. Kämmerling, C. Buchheim, and Uwe Clausen, ***Computers & Operations Research* 96**, Pp 15–29, 2018.
- [9] The quadratic shortest path problem: complexity, approximability, and solution methods, with A. Chassein, M. Hopf, D. Frey, C. Buchheim, F. Malucelli, M. Goerigk, ***European Journal of Operational Research* 268 (2)**, Pp 473–485, 2018.
- [10] Lower bounding procedure for the asymmetric quadratic traveling salesman problem, with F. Malucelli, P. Belotti, and S. Gualandi, ***European Journal of Operational Research* 253 (3)**, Pp 584–592, 2016.
- [11] A decomposition approach for single allocation hub location problems with multiple capacity levels, with C. Strothmann, C. Buchheim, ***Lecture Notes in Computer Science* 9849**, Pp 237–248, 2016.
- [12] A generalized Gilmore-Lawler procedure for the quadratic assignment problem, with F. Malucelli, ***Electronic Notes in Discrete Mathematics* 55**, Pp 77–80, 2016.
- [13] A compact Linearisation of euclidean single allocation hub location problems, with J.F. Meier, U. Clausen, and C. Buchheim, ***Electronic Notes in Discrete Mathematics* 52**, Pp 37–44, 2016.
- [14] Lower bounding procedures for the single allocation hub location problem, with C. Buchheim, J.F. Meier, and U. Clausen, ***Electronic Notes in Discrete Mathematics* 52**, Pp 69–76, 2016.
- [15] Lower bounds for the quadratic minimum spanning tree Problem based on reduced cost computation, with F. Malucelli, ***Computers & Operations Research* 64**, Pp 178–188, 2015.
- [16] On the quadratic shortest path problem, with F. Malucelli, D. Frey, and C. Buchheim, ***Lecture Notes in Computer Science* 9125**, Pp 379–390, 2015.
- [17] A revised reformulation-linearization technique for the quadratic assignment problem, with F. Malucelli, ***Discrete Optimization* 14**, Pp 97–103, 2014.
- [18] A graph optimization approach to item-based collaborative filtering, with P. Cremonesi, F. Malucelli, ***Recent Advances in Computational Optimization***, Springer International Publishing, Pp 15–30, 2013.
- [19] A computational approach to pivot selection in the LP relaxation of set problems, with F. Djannaty, ***Journal of Applied Mathematics and Decision Sciences***, Pp 1–11, 2006.

### Under Review

- [1] A PCA-based approximation scheme for combinatorial optimization with uncertain and correlated data, with G. Desaulniers, F. Errico, A. Lodi, ***Management Science (reject and resubmit)***, 2023.
- [2] Vehicle Utilization in Hub Network Systems with Routing, with Farham, M. S., & Haughton, M., ***Transportation Research Part B: Methodological (in revision)***, 2023.
- [3] Service time window design in routing optimization under uncertainty, with Hosseini, S. D., & Araghi, M., ***Manufacturing & Service Operations Management (submitted)***, 2023.

### Working Papers

- [1] Reliable route planning with stochastic travel times, with S. D. Hosseini, and M. Araghi, 2023.
- [2] 3D Printing: Dual Sourcing Through Second-order Cone Programming, with P. Zadtotoaghaj, 2023.
- [3] Data-Driven Fleet Management in Hub Network Design with Demand Uncertainty, with Farham, M. S., 2023.
- [4] Benders Decomposition Method for Hub Network Design with Vehicle Utilization, with Farham, M. S., & Haughton, M., , 2023.

### Conference Proceedings

- [1] Quadratic TSP: A lower bounding procedure and a column generation approach, with F. Malucelli, P. Belotti, and S. Gualandi, Federated Conference on Computer Science and Information Systems - **FedCSIS 2013**, Pp 377–384, 2013.
- [2] An application of bicriterion shortest paths to collaborative filtering, with P. Cremonesi, F. Malucelli, Federated Conference on Computer Science and Information Systems - **FedCSIS 2012**, Pp 423–429, 2012.

### Technical Report

- [1] The uncapacitated single allocation p-hub median problem with stepwise cost function, with C. Buchheim, [PDF](#), 2017.
- [2] A tight lower bound for the adjacent quadratic assignment problem, with F. Malucelli and P. Belotti, [PDF](#), 2014.
- [3] Application of graph models in recommender systems, *Technical Report 2012.30, Department of Electronics, information and Bioengineering, Polytechnic University of Milan, Milan, Italy*, 2012.

### PhD Dissertation

- [1] Decomposition methods for zero-one quadratic optimization problems, Department of Electronics, information and Bioengineering, Polytechnic University of Milan, 2014.

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### Invited Talks and Conference Presentations

- [1] The Bike-sharing system through a predict-then-optimize paradigm, *CORS Annual Conferences*, Vancouver, Canada, 2022
- [2] Interactions in routing optimization, *CORS Annual Conferences*, Virtual Conference, 2021.
- [3] Single allocation hub location with heterogeneous economies of scale, *CORS Annual Conferences*, Saskatoon, Canada, 2019.
- [4] Stochastic single-allocation hub location, *Optimization Days*, , Montreal, Canada, 2019.
- [5] A convex reformulation and an outer approximation for a class of binary quadratic programs, *ISMP 2018*, Bordeaux, France, 2018.
- [6] Approximate schemes for combinatorial optimization problems with uncertain and correlated data, *CORS Annual Conferences*, Halifax, Canada, 2018.

- [7] A convex reformulation and an outer approximation for a class of binary quadratic programs, *Optimization Days*, , Montreal, Canada, 2018.
- [8] Approximate schemes for combinatorial optimization problems with uncertain and correlated data with application in CVRP, *Optimization Days*, Montreal, Canada, 2018.
- [9] The vehicle routing problem with stochastic and correlated travel times, *21st Conference of the International Federation of Operational Research Societies - IFORS*, Quebec City, Canada, 2017.
- [10] Benders decomposition for binary quadratic programming, *5th EUROPT Workshop on Advances in Continuous Optimization*, Montreal, Canada, 2017.
- [11] The vehicle routing problem with stochastic and correlated travel times, *Optimization Days 2017*, Montreal, Canada, 2017.
- [12] An exact solution approach for single allocation hub location problems with multiple capacity levels, *28th European Conference on Operational Research*, Poznan, Poland, 2016.
- [13] A decomposition approach for single allocation hub location problems with multiple capacity levels, *4rd International Symposium on Combinatorial Optimization - ISCO*, Vietri sul Mare (Salerno), Italy, 2016.
- [14] A generalized Gilmore-Lawler procedure for the quadratic assignment problem, *Cologne Twente Workshop - CTW2016*, Gargnano, Italy, 2016.
- [15] On the quadratic shortest path problem, *14th International Symposium on Experimental Algorithms - SEA2015*, Paris, France, 2015.
- [16] Lower bounding procedures for the single allocation hub location problem, *7th International Network Optimization Conference - INOC 2015*, Warsaw, Poland, 2015.
- [17] Improved lower bound for the quadratic minimum spanning tree problem, *3rd International Symposium on Combinatorial Optimization - ISCO*, Lisbon, Portugal, 2014.
- [18] Quadratic TSP: A lower bounding procedure and a column generation approach, *Federated Conference on Computer Science and Information Systems - FedCSIS 2012*, Kraków, Poland, 2013.
- [19] An application of bicriterion shortest paths to collaborative filtering, *Federated Conference on Computer Science and Information Systems - FedCSIS 2012*, Wroclaw, Poland, 2012.

## Students Supervision

### Postdoc Fellows

September 2023-	Fahimeh Rahimi, "Integration of machine learning and optimization", University of Alberta, Canada.
September 2023-	Amin Aslani, "Assortment planning", University of Alberta, Canada.
March 2022-	Saleh Farham, "Contemporary hub location problems in freight transportation networks: Modeling, applications, and solutions methods", Wilfrid Laurier University and University of Alberta, Canada.
May 2021- Dec 2021	Akbar Karimi, "Unmanned aerial vehicle in parcel delivery and emergency systems", Wilfrid Laurier University, Waterloo, Canada.
Sept 2020-July 2021	Davod Hosseini, "Improving routing optimization under different risk and reliability measures", Wilfrid Laurier University, Waterloo, Canada.

## PhD Students

- 2023- Erfan Rafieikia, “Long Shared Scheduled Transi”, University of Alberta, Canada.
- 2023- Mehrnaz Behrooz, “Data-driven Last-mile delivery with lockers and local crowd-shippers”, University of Alberta, Canada.
- 2021- Parang Zadtootaghaj, “Additive manufacturing: from facility location to humanitarian logistics”, Wilfrid Laurier University, Waterloo, Canada.
- 2021-2022 Atousa Akhlaghy, “Integrated machine learning and optimization in home delivery services”, Wilfrid Laurier University, Waterloo, Canada.
- 2020-2021 Sara Babaee (co-supervisor), “Three essays on the interface of sales and operations management”, Wilfrid Laurier University, Waterloo, Canada.
- 2019-2023 Mahdis Bayani (co-supervisor), “Integration of machine learning and discrete optimization under the presence of interactions”, Polytechnique Montreal, Montreal, Canada.

## MBA and MMA Research Assistants

- 2022 Xi Han, “Prediction and optimization in Bike Rental Systems”, Wilfrid Laurier University, Waterloo, Canada.
- 2022 Jianze Wang, “Prediction and optimization in Bike Rental Systems”, Wilfrid Laurier University, Waterloo, Canada.
- 2019-2021 Pierre Gautreau, “Analysis of environmental, social, and economic impacts of drone delivery”, Wilfrid Laurier University, Waterloo, Canada.
- 2020-2021 J. Eric Oyono, “Data-driven approaches to analyze coopetition and supply chain relationships”, Wilfrid Laurier University, Waterloo, Canada.

## Master’s Thesis

- 2016 Benjamin Schmidt, “Hub breakdown in network design with single allocation”, TU Dortmund University, Dortmund, Germany.
- 2015 Patrick Segieth, “Decomposition approaches for the quadratic assignment problem”, TU Dortmund University, Dortmund, Germany.
- 2015 Nadine Kapias, “Lower bounds for the quadratic assignment problem”, TU Dortmund University, Dortmund, Germany.

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## Teaching Experience

### Graduate Instructor

- Winter 2023 Prescriptive Analytics, MBA Program, Alberta School of Business, University of Alberta, Canada.
- Winter 2022 Decision Making with Analytics, MMA Program, Lazaridis School of Business & Economic, Wilfrid Laurier University, Waterloo, ON, Canada.
- Fall 2021 Machine Learning for Business, MMA Program, Lazaridis School of Business & Economic, Wilfrid Laurier University, Waterloo, ON, Canada.
- Winter 2021 Decision Making with Analytics, MMA Program, Lazaridis School of Business & Economic, Wilfrid Laurier University, Waterloo, ON, Canada.
- Winter 2021 Advanced Business Analytics, MBA Program, Lazaridis School of Business & Economic, Wilfrid Laurier University, Waterloo, ON, Canada.

- Fall 2020 Machine Learning for Business, MMA Program, Lazaridis School of Business & Economic, Wilfrid Laurier University, Waterloo, ON, Canada.
- Spring 2020 Advanced Business Analytics, MBA Program, Lazaridis School of Business & Economic, Wilfrid Laurier University, Waterloo, ON, Canada.
- Spring 2016 Aspects of Mathematical Modeling: Optimization, MSc, TU Dortmund University, Dortmund, Germany.

### **Graduate Co-instructor**

- Fall 2012 Recommender system (part of the course “Interactive TV and Recommender System”), MSc, Computer Science Engineering, Polytechnic University of Milan, Milan, Italy.

### **Undergraduate Instructor**

- Winter 2023 Prescriptive Analytics, Alberta School of Business, University of Alberta, Canada.
- Winter 2020 Business Decision Models, Lazaridis School of Business & Economic, Wilfrid Laurier University, Waterloo, ON, Canada.
- 2006-2010 Operations research1 and Operations research2, Bachelor students in Management science, Industrial engineering, and Applied mathematics, University of Kurdistan, Sanandaj, Iran.
- 2006-2010 The C++ programming language and Graph theory, Bachelor students in Applied mathematics, University of Kurdistan, Sanandaj, Iran.
- 2006-2010 Numerical Analysis, Calculus, Statistics, Differential equations, Bachelor students in Mathematics and Computer Science Engineering, University of Kurdistan, Sanandaj, Iran.

## --- **Scholarly and Professional Activities**

### **Internal grants committee**

- Office of Research Services, Wilfrid Laurier University, 2020

### **Graduate admission committee**

- Master of Management Analytics, Wilfrid Laurier University, 2021
- Master of Supply Chain Management, Wilfrid Laurier University, 2021
- PhD in Supply Chain, Operations and Technology Management, Wilfrid Laurier University, 2020

### **Tenure-track hiring committee**

- ODS Area, Wilfrid Laurier University, 2021

### **Ad-hoc reviewer**

- Transportation Science
- Transportation Research Part B: Methodological
- European Journal of Operational Research
- Networks
- SIAM Journal on Imaging Sciences
- Theoretical Computer Science
- Computers & Operations Research
- INFORMS Journal on Computing

- Discrete Applied Mathematics
- Mathematical Methods of Operations Research

**External reviewer**

- Recherche du Québec – Nature et technologies (FRQNT)

**Session organizer in International conferences**

- Canadian Operational Research Society 2018, 2019, 2021
- Optimization Days 2018
- International Federation of Operational Research Societies 2017
- International Symposium on Combinatorial Optimization 2016