

CURRENT POSITION

Assistant Professor, January 2019–
 Assistant Research Professor, June–December 2018
 Center for Systems Sciences and Engineering
 Malone Center for Engineering in Healthcare
 Civil Engineering Department, Johns Hopkins University

RESEARCH INTEREST

Data-driven operations research, decision analytics, healthcare systems, optimization techniques, robust inverse optimization, mixed-integer optimization, online and approximation algorithms, supervised and unsupervised learning.

EDUCATION

- **Postdoctoral Fellow** at MIT Sloan School of Management, 2015–2018
 Advisor: Professor Retsef Levi, and working with Massachusetts General Hospital, Cambridge, MA
- **Postdoctoral Fellow** in Radiation Oncology, May–Dec 2014
 Advisor: Professor David A. Jaffray; University Health Network, Toronto, Canada
- **Ph.D.** in Industrial Engineering, 2014
 Advisor: Professor Dionne M. Aleman; University of Toronto, Toronto, Canada
- **M.Sc.** in Mathematics, 2006; Thesis-based **M.Eng.** in Computational Science and Engineering, 2009
 Advisors: Professor Tamás Terlaky, Professor Nedialko Nedialkov; McMaster University, Hamilton, Canada
- **B.Sc.** in Mathematics, 2004; Sharif University of Technology, Tehran, Iran

PUBLICATIONS

Journal Papers

1. K. Ghobadi, T. Lee, H. Mahmoudzadeh and D. Terekhov. Robust inverse optimization, *Operations Research Letters*, 46(3):339–344, May 2018.
2. D. Ripsman, D.M. Aleman, and K. Ghobadi. Interactive visual guidance for automated stereotactic radiosurgery treatment planning, *Journal of Expert Systems with Applications*, 42(21):8337–8348, August 2015.
3. E. Doudareva, K. Ghobadi, D.M. Aleman, M. Ruschin and D.A. Jaffray. Skeletonization for isocentre selection in Leksell Gamma Knife Perfexion, *TOP Journal*, 23(2):369–385, June 2015.
4. K. Ghobadi, H.R. Ghaffari, D.M. Aleman, M. Ruschin and D.A. Jaffray. Automated treatment planning for a dedicated multi-source intra-cranial radiosurgery treatment unit accounting for overlapping structures and dose homogeneity, *Journal of Medical Physics*, 40(9):091715, September 2013.
5. K. Ghobadi, H.R. Ghaffari, D.M. Aleman, D.A. Jaffray and M. Ruschin. Automated treatment planning for a dedicated multi-source intra-cranial radiosurgery treatment unit using projected gradient and grassfire algorithms, *Journal of Medical Physics*, 39(6):3134–3142, June 2012.

Submitted Papers

1. K. Ghobadi, D.M. Aleman, D.A. Jaffray and M. Ruschin. A new model for automated inverse planning with continuous dose delivery capability for stereotactic radiosurgery devices, under revision in *European Journal of Operational Research (EJOR)*, 2017.
2. P.F. Dunn, K. Ghobadi, I. Lennes, R. Levi, A. Marshall, W. Rieb and A.C. Zenteno. Real-time outpatient scheduling with patient choice, submitted to *Manufacturing & Service Operations Management (MSOM)* and a revision is requested, 2016.
3. K. Ghobadi, A. Johnston, R. Levi, R. Berube, P.F. Dunn and W. O'Donnell. Effects on staffing rotation patterns on inpatient length of stay: a natural randomized control experiment, to be submitted to *New England Journal of Medicine (NEJM)*, 2018.

Refereed Proceedings and Abstracts

1. K. Ghobadi, D.M. Aleman, D.A. Jaffray and M. Ruschin. A linear model for continuous path treatments for stereotactic radiosurgery, Proceedings of the *Industrial and Systems Engineering Research Annual Conference (ISERC)*, 2013.
2. K. Ghobadi, D.M. Aleman, D.A. Jaffray and M. Ruschin. Continuous path radiation therapy treatment planning for Gamma Knife Perfexion, *Journal of Medical Physics*, 40:517, 2013.
3. K. Ghobadi, H.R. Ghaffari, D.M. Aleman, D.A. Jaffray and M. Ruschin. Automated inverse planning optimization approach for single-fraction and fractionated radiosurgery using Gamma Knife Perfexion, *Journal of Medical Physics*, 39(6):3610, 2012.
4. H.R. Ghaffari, K. Ghobadi, D.M. Aleman, M. Ruschin and D.A. Jaffray. Automated optimization of treatment plans for a dedicated stereotactic radiotherapy device using intelligent isocenter selection and penalty-based weight optimization, *Journal of Medical Physics*, 38(6):3866, 2011.

Non-refereed Journal Publications and Technical Reports

1. K. Ghobadi, A.C. Zenteno, A. Marshall, P.F. Dunn, R. Levi and J.H. Stone. Translating a biologic revolution into an organizational overhaul, *New England Journal of Medicine Catalyst*, October 2016. <http://catalyst.nejm.org/biologic-therapy-revolution-organizational-overhaul/>
2. K. Ghobadi, N. Nedialkov and T. Terlaky. On the discretize-then-optimize approach, Department of Industrial and Systems Engineering, Lehigh University, PA. https://ise.lehigh.edu/sites/ise.lehigh.edu/files/09t_005.pdf

Working Papers

1. K. Ghobadi, M. Hu and R. Levi. Optimal competitive scheduling algorithms for online minimum maximum utilization problem, targeted for *Journal of Operations Management*.
2. P.F. Dunn, K. Ghobadi, R. Levi, B. Fosburgh, V. Patel and A.C. Zenteno. Load-balancing in primary care through efficient session scheduling optimization, targeted for *Interfaces*.
3. P.F. Dunn, P. Ebben, K. Ghobadi, R. Levi, and B. Yun. Alternative care paths for ambulatory care sensitive patients, targeted for *New England Journal of Medicine*.
4. K. Ghobadi, C. Chung, H. Nordstrom and D.A. Jaffray. Continuous dose delivery for brain and eye tumours, targeted for *Journal of Medical Physics*.
5. K. Ghobadi, N. Nedialkov and T. Terlaky. On the discretize-then-optimize approach, targeted for *Journal of Computational Optimization and Applications*.
6. K. Ghobadi, H. Nordstrom, D.M. Aleman and D.A. Jaffray. Automated inverse planning for Perfexion, targeted for *Journal of Medical Physics*.

TEACHING EXPERIENCE

Lecturer

1. “Integer Programming” (MIE1603), Graduate course, University of Toronto, 2014.
2. “Advanced Operations Research” (MIE365), co-instructed with a fellow PhD student, third-year undergraduate course, University of Toronto, 2011.

Teaching Assistant

- **University of Toronto:**
 1. “Operations Research I” (*4 semesters*), software lab, 100+ students, 2010–2014 (head TA in 2012–2014).
 2. “Ordinary Differential Equations” (*3 semesters*), 200+ students, 2011–2014.
 3. “Computational Finance and Risk Management”, graduate course, 30 students, 2013.
 4. “Cases in Operations Research” (*2 semesters*), 50 students, 2011–2012.
 5. “Numerical Methods” (*2 semesters*), software lab, 100+ students, 2009–2010.
- **McMaster University:** “Math Help Center” (*4 semesters*, for students in engineering, physical and natural sciences, and humanities and social sciences), 2006–2009; “Graph Theory”, “Scientific Computations”, 2006; “Calculus I”, “Calculus II”, “Linear Algebra”, 2005.
- **Sharif University of Technology:** “Probability and Statistics I”, “Mathematics for Economists”, 2003.

LEADERSHIP EXPERIENCE

- Co-founder and president, INFORMS University of Toronto Student Chapter (2013) and Canadian Operations Research Society (CORS) Toronto Student Chapter (2012–2013).
- Co-founder and president (2012–2013), executive member (2010–2012), University of Toronto Operations Research Group (UTORG), Institutional group, University of Toronto.
- Co-founder and elected executive member (2007–2009), Graduate Computational Club, Departmental group, McMaster University.
- Elected chair and executive member (2002–2004), Math Student Group, Departmental group, Sharif University.

SCHOLARSHIPS AND HONOURS

- Natural Sciences and Engineering Research Council of Canada Post-doctoral Fellowship (NSERC PDF), National Competition, 2014 (\$90,000 for two years).
- INFORMS Judith Liebman Award for Outstanding Student Volunteer Work at University of Toronto Student Chapter, 2014.
- First Place in Poster Competition, OCAIRO 11th Imaging Network Ontario (ImNO) Symposium, 2013.
- Natural Sciences and Engineering Research Council of Canada Postgraduate Scholarships (NSERC PGS-D), National Competition, 2011 (\$42,000 for two years).
- Ontario Graduate Scholarship (OGS), Provincial Competition, 2011 (\$15,000).
- Mart Liinve Ontario Graduate Scholarship (OGSST), Institutional Competition, 2010 (\$15,000).
- Shared Hierarchical Academic Research Computing Network (SHARCNET) Graduate Fellowship, Multi-Instit. Competition, 2008 (\$22,000).
- University of Toronto Graduate Fellowship, Departmental Competition, 2009 (\$7,000 annually).
- McMaster University Graduate Fellowship, Departmental Competition, 2005–2009 (\$10,000 annually).

MENTORSHIP EXPERIENCE

MIT

- Dual MBA and Engineering Master's students (Leaders of Global Operations) at Sloan School of Management
 - 1) Philip Ebben, 2017–present; 2) Jordan Hoffmann, 2016–2017; 3) Andrew Johnston, 2015–2016;
 - 4) Adam Marshall, 2015–2016.
- Undergraduate students
 - 1) Mary Theilking, 2015–2016; 2) Alejandro Velez, 2015–2016.

University of Toronto

- Master's students in Industrial Engineering: 1) Marlee Vandewouw, 2014–2015.
- Undergraduate students
 - 1) Yago Oliveira, 2014–2015; 2) Danielle Ripsman, 2013–2014; 3) Evgueniia Doudareva, 2011–2012.

SELECTED PRESENTATIONS

1. Staffing Rotation Effects on Patients Length of Stay
 - MSOM 2017 (*Refereed*), INFORMS 2017/2015, CORS 2016, POMS 2016.
2. Online Scheduling Algorithms For Infusion Outpatients
 - INFORMS 2017, INFOMRS Healthcare 2017, POMS 2017.
3. Robust Inverse Optimization

- INFORMS 2017/2016, CORS 2017/2016.
- 4. Continuous Path Dose Delivery with Gamma Knife Perfection (various sub-projects)
 - AAPM 2015/2013 (*Refereed*, 2015 Poster), World Congress on Med. Phys. 2015 (*Refereed*), INFORMS 2015/2014/2013, Imaging Network Ontario 2014/2013 (*Refereed*, Oral and Poster), CORS 2014, ISERC 2014, IMRT Workshop 2014, IIE 2013.
- 5. Automated Inverse Planning for Radiosurgery (various sub-projects)
 - AAPM 2012/2011 (*Refereed*), INFORMS 2012/2011, INFORMS International 2012, OCCAIRO lecture series 2012, CORS 2012, INFORMS Healthcare 2011, IIE 2011, High-performance Numerical Methods for IMRT 2011.
- 6. Discretization and Optimization in Heat Transfer
 - INFORMS 2009, WISE 2009, MOPTA 2008/2006 (Poster), MITACS 2008/2006 (Poster).

Guest Speaker

- Automated Radiation Therapy Treatment Planning (various sub-projects)
 1. INFORMS Student Chapter, Northeastern University, 2015.
 2. DOS Seminars; Georgia Institute of Technology, 2014.
 3. INFORMS Student Chapter, University of Toronto, 2014/2011.
 4. HOIM Summer School, 2014.
 5. IIE Society for Health Systems (Webinar), 2011.
 6. Radiation Physics Seminar, Princess Margaret Cancer Centre, 2010.

TOOLS AND PROGRAMMING SKILLS

- Programming: C/C++, Java, Python, Pascal.
- Scientific: Matlab, Julia/JuMP, R Statistical Programming Language, AMPL, VBA/Excel, Maple, Mathematica, Parallel Matlab, Message passing interface (MPI), Open multiprocessing (OpenMP) and shared-memory.
- Solvers: Gurobi, Mosek, CPLEX, IPOPT.

SOCIETY SERVICES AND PROFESSIONAL MEMBERSHIPS

- Ad-hoc reviewer in IIE Transactions on Healthcare Systems Engineering; Optimization Letters; Neural Computing and Applications; INFORMS Journal on Computing; Int. Journal of Radiation Oncology Biology Physics (Red Journal); Journal of Biomedical Physics & Engineering Express; IEEE Conference on Industrial Electronics and Applications.
- Host of invited distinguished speakers (multiple occasions), seminar chair (multiple occasions), and moderator; Sept. 2010–Aug. 2013; University of Toronto.
- Member of CORS, INFORMS, SIAM, IIE.
- Trainee in NSERC CREATE in Healthcare Operations and Information Management, 2011–2014.