Christopher Thomas Ryan (August 12, 2019)

CONTACT INFORMATION

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RESEARCH INTERESTS

theory of optimization, contract theory, algorithmic game theory, revenue management, digital economy, health care operations

EMPLOYMENT

University of British Columbia

Assistant Professor
September 2019 –.

University of Chicago

Associate Professor of Operations Management
July 2016 – August 2019.
Assistant Professor of Operations Management
July 2010 – July 2016.

Colibri Learning Foundation (colibrilearning.org)

Curriculum development and discussion leadership training (volunteer positions)
2005 – present.

EDUCATION

University of British Columbia

Ph.D., Sauder School of Business, 2010

- Dissertation Topic: “Computing solution concepts in games with integer decisions"
- Advisor: Maurice Queyranne

B.A. (honors), Mathematics, 2005

University of Guelph

B. A. (honors), Sociology and Economics, (transferred to UBC in September 2002)

RESEARCH PAPERS

Published or forthcoming journal publications

A. Basu, C.T. Ryan, and S. Sankaranarayanan. Mixed-integer bilevel representability. To appear in *Mathematical Programming*.

A. Basu, K. Martin, C.T. Ryan, and G. Wang (2018). Mixed integer representability, disjunctions and elimination. To appear in *Mathematics of Operations Research*. (Preliminary version appeared in the *Proceedings of the 2017 IPCO conference: Integer Programming and Combinatorial Optimization*.)

R. Ke and C.T. Ryan (2018). A general solution method for moral hazard problems. *Theoretical Economics*, Volume 13, Issue 3, Pages 1425–1481.

R. Ke and C.T. Ryan (2018). Monotonicity of optimal contracts without the first order approach. *Operations Research*, Volume 66, Issue 4, Pages 1101-1118.

Y. Ding, D. Ge, S. He and C.T. Ryan (2018). A non-asymptotic approach to analyzing kidney exchange graphs. *Operations Research*, Volume, Issue 4, Pages 918-935. (appeared in the *Proceedings of the 2015 ACM-EC conference: Economics and Computation.*)

C.T. Ryan, R.L. Smith, and M. Epelman (2018). A simplex method for uncapacitated pure-supply infinite network flow problems. *SIAM Journal on Optimization*, Volume 28, Issue 3, Pages 2022-2048.

A. Basu, K. Martin and C.T. Ryan (2017). Strong duality and sensitivity analysis in semi-infinite linear programming. *Mathematical Programming*, Volume 26, Issue 1, Pages 451–485.

K. Martin, C.T. Ryan and M. Stern (2016). The Slater conundrum: Duality and pricing in infinite dimensional optimization. *SIAM Journal on Optimization*, Volume 26, Issue 1, Pages 111–138.

A. Basu, K. Martin, and C.T. Ryan (2014). Projection: A unified approach to semi-infinite linear programs and duality in convex programming. *Mathematics of Operations Research.* Volume 40, Issue 11, Pages 146–170.

A. Basu, K. Martin, and C.T. Ryan (2013). On the sufficiency of finite support duals in semi-infinite linear programs. *Operations Research Letters*, Volume 42, Issue 1, pages 16–20.

M. Köppe, C.T. Ryan, and M. Queyranne (2011). Rational generating functions and integer programming games. *Operations Research*, Volume 59, Number 1, Pages 1445–1460.

M. Köppe, M. Queyranne and C.T. Ryan (2010). Parametric integer programming algorithm for bilevel mixed integer programs. *Journal of Optimization Theory and Applications*, Volume 146, Number 1, Pages 137–150.

Published peer-reviewed conference proceedings

C.T. Ryan, A. X. Jiang and K. Leyton-Brown (2010). Computing pure strategy Nash equilibria in compact symmetric games. *Proceedings of the 2010 ACM-EC conference: Electronic Commerce*, Pages 63–72.

Under revision

X. Chen, S. He, B. Jiang, C.T. Ryan, and T. Zhang. The discrete moment problem with nonconvex shape constraints. Under revision at *Operations Research.*

M. Nagarajan, C.T. Ryan, L. Sheng, Y. Cheng and C. Tong. Incentivized actions in freemium games. Under revision at *Manufacturing & Service Operations Management.*

T. Dai, R. Ke, and C.T. Ryan. Incentive design for marketing-operations multitasking. Under revision at *Management Science.*

R. Ke and C.T. Ryan. A penalty function approach to necessary optimality conditions in bilevel optimization. Under revision at *Mathematical Programming.*

Y. Feng, R. Caldentey, and C.T. Ryan. Learning customer preferences from personalized assortments. Under revision at *Operations Research*.

C.T. Ryan and R.L. Smith. Dual-based methods for solving infinite-horizon nonstationary deterministic dynamic programs. Under revision at *Mathematical Programming*.

Submitted papers

H.-S. Ahn, C.T. Ryan, J. Uichanco, and M. Zhang. Pricing in fast-moving markets.

A. Ghate, C.T. Ryan, and R.L. Smith. A simplex method for countably-infinite linear programs.

Working papers

M. Köppe, M. Queyranne and C.T. Ryan. Implementability of ordinal preferences.

Ongoing research projects

C.T. Ryan and R.L. Smith. On the definition of infinite-dimensional polytopes.

M.A. Epelman, C.T. Ryan, and R.L. Smith. Minimum spanning trees in infinite graphs.

R. Ke and C.T. Ryan. The binary action approach.

L. Hillas, C.T. Ryan, and G. Wang. Projection and duality: A unifying framework.

Teaching Experience

University of Chicago

Recipient of the 2018 Faculty Excellence Award for teaching in the Evening and Weekend MBA program.

Instructor **Jan-Mar, Sep-Dec 2017, Apr-June 2019 (scheduled)**
Managing Service Operations (BUS 40110) MBA program.

- Developed case materials in collaboration with multiple companies for course projects in the course, including with former Booth students with startups.

Instructor **Mar-June 2011, 2012, 2013, 2015 Sep-Dec, 2013, 2015**
Operations Management: Business Process Fundamentals (BUS 40000) MBA program.

Instructor **Mar-Apr 2016 (5 weeks)**
Combinatorial Optimization (BUS 40610) PhD program.

Instructor **Jan-Mar 2012, Apr-June 2014, 2019 (scheduled)**
Optimization in Topological Vector Spaces (BUS 36904 Special Topics in Management Science). PhD program.

University of British Columbia

Instructor **May-June 2009**
Logistics and Operations Management (COMM 399). Undergraduate.

Instructor **Jan - Apr, 2008**
Applications of Statistics in Business (COMM 291). Undergraduate.

Lecturer **Jan-April 2009**
Optimization Theory and Applications (COMM 616). (12 classroom hours)
Topics in discrete optimization: Computational complexity, shortest path algorithms, cutting planes.
PhD program.

CASE STUDIES **In development**

Ezza Nails (with Kim Marsh)

Advocate Children's Sleep Network (with Darius Loghmanee, Matthew Balog, and Noah Hamilton)

VOCEL: Early Childhood Education in Chicago (with Kelly Lambrinatos)

The Minte: Hotel-Style Housekeeping (with Kat Wilson and Melanie Jackson)

Brewbike (with Randy Paris)

Kumwe Harvest: Social enterprise in Rwanda (with Cyril Khamsi and Alex Sanderson)

PRESENTATIONS **Invited seminars**

2019: Washington University in Saint Louis, UT Austin, Univeristy of Florida

2018: University of Toronto (Rotman), Johns Hopkins (Carey), Harvard Business School, Chinese Academy of Science (Institute for Computational Mathematics), Hong Kong Baptist University (Economics), Minzu University, University of Wisconsin-Madison (Business School and Industrial Engineering), Duke Fuqua, University of Michigan (Ross and IOE), UCLA, MIT, University of Virginia Darden, Cornell Johnson, Wake Forest, University of British Columbia, University of Alberta

2017: University of Southern California (ISE), University of British Columbia Sauder, Simon Fraser University (Mathematics), University of Chicago

2016: University of Kansas, University of Washington (IE), University of Waterloo, University of Toronto (IE), University of British Columbia

2015: Chinese University of Hong Kong (Economics), University of Alberta

2014: New York University, University of California-Irvine, Northwestern University, University of Michigan-Ann Arbor (IOE), Georgia Tech (ISyE), Carnegie Mellon University, Shanghai University of Finance and Economics, Massachusetts Institute of Technology, Haverford College (Mathematics), University of Indiana-Bloomington (Telecommunications), University of Minnesota (ISyE), University of British Columbia-Okanagan (Mathematics)

2012: University of British Columbia, Universidad de Chile, Chinese Academy of Science

2010: University of Southern California, University of Chicago, New York University, MIT

2009: Chinese Academy of Science, Peking University, University of California-Davis

2008: University of British Columbia, Simon Fraser University, University of Washington, University of Magdeburg

Invited conference presentations

2019: POMS (scheduled), INFORMS Annual Meeting (scheduled)

2018: INFORMS Optimization, POMS, International Symposium of Mathematical Programming (ISMP), INFORMS Annual Meeting

2017: SIAM Conference on Optimization (SIOPT), INFORMS Annual Meeting

2016: International Conference on Continuous Optimization (ICCOPT), INFORMS Annual Meeting

2015: INFORMS Annual Meeting, International Symposium of Mathematical Programming (ISMP)

2014: INFORMS Annual Meeting, Manufacturing and Services Operations Management (MSOM), SIAM Conference on Optimization (SIOPT)

2012: INFORMS Annual Meeting, ISMP

2010: Behavioral and Quantitative Game Theory, INFORMS Annual Meeting

2009: ISMP, American Mathematical Society (AMS) Spring Western Section Meeting, San Francisco, 25–26 April 2009.

2008: American Mathematical Society (AMS) Fall Western Section Meeting

Service

Editorial positions
Associate editor at *Operations Research Letters*

Program Committees
ACM Conference on Economics and Computation 2018 (ACM-EC'18)

Ad-hoc reviewer
Operations Research, Management Science, Manufacturing & Service Operations Management, Production and Operations Management, Econometrica, Mathematics of Operations Research, Mathematical Programming, SIAM Journal on Optimization, INFORMS Journal of Computing, European Journal of Operational Research, Games and Economic Behavior, International Journal of Game Theory, Networks, Journal of Mathematical Economics, Operations Research Letters, Journal of Combinatorial Optimization, Workshop in Networks and Economics (WINE), Optimization Letters

NSF panelist (2015)

NSERC Discovery Grant reviewer (2017, 2018)

PhD students (advisor/co-advisor role)
Lisa Hillas (Booth)

PhD committee member (at Chicago Booth unless otherwise indicated)
Vishal Ahuja, Xiao Wu, Angelo Mancini, Matt Stern, Lifei Sheng (UBC), Yifan Feng, Mengzhenyu Zhang (UMichigan Ross)

Academic mentor to undergraduate students (all students from Shanghai University of Finance and Economics, Fudan University, or Shanghai Jiaotong University)
Runshan Fu (PhD student at CMU in MIS), Mengzhenyu Zhang (PhD student at Michigan Ross in OM), Jiding Zhang (PhD student at Wharton in OM), Teng Zhang (PhD student at Stanford MS&E), Wenjia Ba (PhD student at Stanford GSB in OM), Tongxin Zhou (PhD student at University of Washington in MIS), and Ren Yi (PhD student at Columbia University in IEOR)

Conference organization
Mixed Integer Programming Workshop (local committee, hosted at Gleacher Center, University of Chicago, 2015)