

Z. Caner Taşkın

Associate Professor

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Education

- **Ph.D., *Industrial and Systems Engineering***, August 2009
University of Florida, Gainesville, FL
 - Dissertation: “Algorithms for Solving Multi-Level Optimization Problems with Discrete Variables at Multiple Levels”
- **M.S., *Industrial Engineering***, August 2005
Boğaziçi University, İstanbul, Turkey
 - Thesis: “Tactical and Strategic Level Planning in Float Glass Manufacturing with Co-production, Random Yields and Substitutable Products”
- **B.S., *Industrial Engineering***, June 2003
Boğaziçi University, İstanbul, Turkey

Employment

- August 2013 – Present: Associate Professor, Department of Industrial Engineering, Boğaziçi University (passed ÜAK exam in November 2012)
- September 2009 – August 2013: Assistant Professor, Department of Industrial Engineering, Boğaziçi University

Honors

- EURO Excellence in Practice Award (EEPA 2015) – Finalist (July 2015)
- YAEM 2012 – Best IE/OR Application Award (June 2012)
- IIE Pritsker Doctoral Dissertation Award, First Place (July 2010)
- INFORMS Future Academician Colloquium Participant (November 2008)
- Graduate Student Award for Excellence in Research, Department of Industrial and Systems Engineering, University of Florida (April 2008)
- University of Florida Alumni Fellowship (2005-2009)
- Dean's High Honor List, Boğaziçi University (June 2003)
- Nadide & Ahmet Göksu Scholarship (2001-2003)
- Boğaziçi University Honor Scholarship (1999-2001)
- Ranked 4th among 1.5 million students in Turkish National University Entrance Exam (June 1999)

Journal Publications

1. Betül Ahat, Tınaz Ekim, **Z. Caner Taşkın**, “Integer Programming Formulations and Benders Decomposition for Maximum Induced Matching Problem,” forthcoming in *INFORMS Journal on Computing*, 2017
2. **Z. Caner Taşkın**, J. Cole Smith, “Branch-Cut-Price Algorithms for Solving a Class of Search Problems on General Graphs,” forthcoming in *Networks*, 2017
3. Semra Ağralı, **Z. Caner Taşkın**, A. Tamer Ünal, “Employee Scheduling in Service Industries with Flexible Employee Availability and Demand,” *Omega*, 66 (A), 159–169, 2017
4. Yavuz Türkoğulları, **Z. Caner Taşkın**, Necati Aras, Kuban Altınel, “Optimal berth allocation, time-variant quay crane assignment and scheduling with crane setups in container terminals,” *European Journal of Operational Research*, 254 (3), 985-1001, 2016.
5. **Z. Caner Taşkın**, Semra Ağralı, A. Tamer Ünal, Vahdet Belada, Filiz Gökten-Yılmaz, “Mathematical Programming-Based Sales and Operations Planning at Vestel Electronics,” *Interfaces*, 45 (4), 325-340, 2015
6. Merve Gören, **Z. Caner Taşkın**, “A column generation approach for comparing delivery efficiency of different collimator technologies in IMRT treatment planning,” *Physics in Medicine and Biology*, 60, 1989-2004, 2015.
7. Abdullah Sarıduman, Ali Emre Pusane, **Z. Caner Taşkın**, “An Integer Programming-Based Search Technique for Error-Prone Substructures of LDPC Codes,” *AEU - International Journal of Electronics and Communications*, 68, 1097-1105, 2014.
8. Yavuz Türkoğulları, **Z. Caner Taşkın**, Necati Aras, Kuban Altınel, “Optimal berth allocation and time-invariant quay crane assignment in container terminals,” *European Journal of Operational Research*, 235 (1), 88-101, 2014.
9. Merve Bodur, Tınaz Ekim, **Z. Caner Taşkın**, “Decomposition Algorithms for Solving the Minimum Weight Maximal Matching Problem,” *Networks*, 62 (4), 273-287, 2013.
10. **Z. Caner Taşkın**, Mucahit Cevik, “Combinatorial Benders Cuts for Decomposing IMRT Fluence Maps Using Rectangular Apertures,” *Computers and Operations Research*, 40 (9), 2178-2186, 2013.
11. Semra Ağralı, Joseph Geunes, **Z. Caner Taşkın**, “A Facility Location Model with Safety Stock Costs: Analysis of the Cost of Single-Sourcing Requirements,” *Journal of Global Optimization*, 54(3), 551-581, 2012.
12. **Z. Caner Taşkın**, Tınaz Ekim, “Integer Programming Formulations for the Minimum Weighted Maximal Matching Problem,” *Optimization Letters*, 6 (6), 1161-1171, 2012.
13. **Z. Caner Taşkın**, J. Cole Smith, H. Edwin Romeijn, “Mixed-Integer Programming Techniques for Decomposing IMRT Fluence Maps Using Rectangular Apertures,” *Annals of Operations Research*, 196(1), 799-818, 2012.
14. **Z. Caner Taşkın**, J. Cole Smith, H. Edwin Romeijn, James F. Dempsey, “Optimal Multileaf Collimator Leaf Sequencing in IMRT Treatment Planning,” *Operations Research*, 58(3), 674-690, 2010.
15. **Z. Caner Taşkın**, J. Cole Smith, Shabbir Ahmed, Andrew J. Schaefer, “Cutting Plane Algorithms for Solving a Stochastic Edge-Partition Problem,” *Discrete Optimization*, 6 (4), 420-435, 2009.

16. **Z. Caner Taşkın**, A. Tamer Ünal, “Tactical Level Planning in Float Glass Manufacturing with Co-Production, Random Yields and Substitutable Products,” *European Journal of Operational Research*, 199, 252-261, 2009.
17. Chunhua Men, H. Edwin Romeijn, **Z. Caner Taşkın**, James F. Dempsey, “An Exact Approach to Direct Aperture Optimization in IMRT Treatment Planning,” *Physics in Medicine and Biology*, 52, 7333–7352, 2007.

Submitted Papers

1. Banu Kabakulak, **Z. Caner Taşkın**, Ali Emre Pusane, “Optimization-Based Decoding Algorithms for LDPC Convolutional Codes in Communication Systems.”
2. Aslı Aydın, **Z. Caner Taşkın**, “Decentralized Decomposition Algorithms for Block Angular Linear Programs.”
3. Pınar Dursun, **Z. Caner Taşkın**, İ. Kuban Altınel, “The Determination of Optimal Treatment Plans for Volumetric Modulated Arc Therapy (VMAT)”
4. Banu Kabakulak, **Z. Caner Taşkın**, Ali Emre Pusane, “A Branch-and-Cut Algorithm to Design LDPC Codes Without Small Cycles in Communication Systems.”
5. İ. Kuban Altınel, Necati Aras, Zeynep Şuvak, **Z. Caner Taşkın**, “Minimum Cost Noncrossing Flow Problem on Layered Networks”
6. Murat Güngör, A. Tamer Ünal, **Z. Caner Taşkın**, “A parallel machine lot-sizing and scheduling problem with a secondary resource and cumulative demand”
7. A. Tamer Ünal, Semra Ağralı, **Z. Caner Taşkın**, Wilco Esselink, Hans Stolp, “Strong integer programming formulations for hybrid flowshop scheduling”
8. Oylum Şeker, Pınar Heggerneş, Tınaz Ekim, **Z. Caner Taşkın**, “Linear-time generation of random chordal graphs using subtrees of a tree”

Book Chapters

1. Oylum Şeker, Pınar Heggerneş, Tınaz Ekim, **Z. Caner Taşkın**, “Linear-time generation of random chordal graphs,” in *Lecture Notes in Computer Science*, Fotakis D., Pagourtzis A., Paschos V. (Editors) Algorithms and Complexity. CIAC vol 10236, 2017
2. Zehra Melis Teksan, Ali Tamer Ünal, **Z. Caner Taşkın**, “Integrated Production Planning, Shift Planning, and Detailed Scheduling in a Tissue Paper Manufacturer,” in *Models, Algorithms, and Technologies for Network Analysis*, Boris Goldengorin, Valery A. Kalyagin, Panos M. Pardalos (Editors), Springer, 2012.
3. **Z. Caner Taşkın**, “Benders Decomposition,” in *Encyclopedia of Operations Research and Management Science*, J. J. Cochran (Editor), Wiley, 2010.
4. J. Cole Smith, **Z. Caner Taşkın**, “A Tutorial Guide to Mixed-Integer Programming Models and Solution Techniques,” in *Optimization in Medicine and Biology*, G. J. Lim, E. K. Lee (Eds), Taylor and Francis, Auerbach Publications, 2008.

Refereed Conference Proceedings

1. Pınar Dursun, **Z. Caner Taşkın**, İ. Kuban Altınel, “Mathematical Models for Optimal Volumetric Modulated Arc Therapy (VMAT) Treatment Planning,” in *Procedia Computer Science*, 100, 644-651, *Proceedings of The International Conference on Health and Social Care Information Systems and Technologies (HCist 2016)*, 2016.

2. Abdullah Sarıduman, Ali Emre Pusane, **Z. Caner Taşkın**, “A heuristic method for adaptive linear programming decoding,” in *Proceedings of Signal Processing and Communications Applications Conference (SIU 2016)*, 2014.
3. İ. Kuban Altınel, Yavuz B. Türkoğulları, **Z. Caner Taşkın**, Necati Aras, “Optimal Berth Allocation, Time-variant Quay Crane Assignment and Scheduling with Crane Setups in Container Terminals,” in *Proceedings of The 2015 International Conference on Logistics and Maritime Systems (LOGMS 2015)*, 2015.
4. Abdullah Sarıduman, Ali Emre Pusane, **Z. Caner Taşkın**, “Adaptive Linear Programming for Decoding LDPC Codes,” in *Proceedings of Signal Processing and Communications Applications Conference (SIU 2014)*, 2014.
5. Necati Aras, Yavuz Türkoğulları, **Z. Caner Taşkın**, Kuban Altınel, “Simultaneous Optimization of Berth Allocation, Quay Crane Assignment and Quay Crane Scheduling Problems in Container Terminals,” in *Proceedings of International Annual Conference of the German OR Society 2012 (OR 2012)*, 2012.
6. Z. Melis Teksan, **Z. Caner Taşkın**, “A Mixed Integer Programming Based Solution Methodology for a Scheduling Problem in Tissue Paper Manufacturing,” in *13th International Conference on Project Management and Scheduling (PMS 2012)*, 2012
7. Abdullah Sarıduman, Ali Emre Pusane, **Z. Caner Taşkın**, “An Integer Programming Based Trapping Set Search Technique,” in *Proceedings of Signal Processing and Communications Applications Conference (SIU 2012)*, 2012.

Teaching Experience

- **Instructor**, Boğaziçi University
 - IE 201: Intermediate Programming (Spring 2013, Spring 2014, Spring 2015, Spring 2016, Spring 2017)
 - IE 305: Operations Research II (Fall 2010, Fall 2011, Spring 2012, Spring 2013, Fall 2013, Spring 2014, Spring 2015, Spring 2016, Spring 2017)
 - IE 499: Enterprise Information Systems Modeling (Spring 2010, Spring 2012)
 - IE 515: Graphs and Network Flows (Spring 2011, Fall 2012, Fall 2014, Fall 2016)
 - IE 613: Large-scale Programming (Fall 2015)
- **Teaching Assistant**, University of Florida (Fall 2006, Fall 2007)
 - ESI 6314: Deterministic Methods of Operations Research

Academic Projects

- **TÜBİTAK 1001:** “Lot-Sizing Models for Co-Production Systems and Their Solution Algorithms” (Researcher) 01/2017 – 07/2019
- **TÜBİTAK 1001:** “Optimization-Based Decoding Algorithms for LDPC Convolutional Codes in Communication Systems” (PI) 10/2013 – 10/2016
- **TÜBİTAK 2221:** “Improving Blood Supply Chains” (PI) 06/2014 – 09/2014
- **TÜBİTAK 1501:** “Vehicle Maintenance Planning System ABAPS” (Researcher) 07/2015 – 12/2017
- **TÜBİTAK 1501:** “Development of a Distributed Workforce Planning and Optimization System (ICRON WFM)” (Researcher) 10/2012 – 10/2014
- **TÜBİTAK 1501:** “Business-Oriented Mathematical Modeling: Supply Chain Optimization Application” (Researcher) 11/2010 – 10/2012
- **Boğaziçi University BAP:** “The Determination of Optimal Treatment Plans for Volumetric Modulated Arc Therapy (VMAT)” (Researcher) 02/2016 – 02/2018
- **Boğaziçi University BAP:** “The Selective Graph Coloring Problem” (Co-PI) 07/2016 – 07/2018
- **Boğaziçi University BAP:** “A Novel Decomposition Algorithm for Large-Scale Linear and Integer Programming” (PI) 12/2011 – 03/2014
- **Boğaziçi University BAP:** “Design and Development of an Object-Oriented Mathematical Modeling System” (PI) 03/2010 – 03/2011
- **IBM Open Collaborative Research Initiative:** “Integrated Optimization of Container Terminals” (Researcher) 11/2011 – 11/2012

Industry Projects

- **Enerjisa:** “Optimization of Energy Generation in Hydroelectric Power Plants” (Academic Advisor) 12/2016 – 04/2017
- **Vestel Electronics:** “Development of a Decision Support System for the Capable-to-Promise Process” (Academic Advisor) 01/2016 – 11/2016
- **ICRON Technologies:** “Development of a Vehicle Maintenance Planning System” (Academic Advisor) 07/2015 – 12/2017
- **Trakya Cam:** “Development of an Optimization-Based Decision Support System for Strategic Planning” (Academic Advisor) 03/2016 – 07/2016
- **Borusan Logistics:** “Design and Development of a Decision Support System for Milkrun Route Optimization” (Academic Advisor) 05/2015 – 05/2016
- **Trakya Cam:** “Design and Implementation of an Optimization Model for Sales & Operations Planning” (Academic Advisor) 05/2015 – 02/2017
- **Digipolis:** “Development of an Optimization-Based Decision Support System for Workforce Planning” (Academic Advisor) 03/2014 – 01/2015
- **ICRON Technologies:** “Extensions on a Distributed Workforce Planning and Optimization System” (Academic Advisor) 01/2013 – 03/2015

- **ASML:** “Design and Development of Scenario Planning and Optimization Tool (SPOT)” (Academic Advisor) 05/2012 – 06/2014
- **ICRON Technologies:** “Extending an Object-Oriented Mathematical Modeling System to Large-Scale Optimization” (Academic Advisor) 01/2012 – 03/2013
- **SMIT Transformers:** “Building An Optimization-Based Decision Support System for Winding Planning Process” (Academic Advisor) 04/2011 – 02/2012
- **ICRON Technologies:** “Smart Chainge Distributed Planning” (Academic Advisor) 01/2010 – 01/2012
- **Vestel Electronics:** “Sales and Operations Planning Optimization” (Academic Advisor) 12/2010 – 11/2011

Ph.D. Students

- M. Aslı Aydın, “Decentralized Decomposition Methods for Block Angular Linear and Integer Programming Problems,” (2016)
- Banu Kabakulak, “Design and Analysis of Communication Systems with High Error Correction Capability Through Optimization” (2017)
- Pınar Dursun (co-advised with İ. Kuban Altınel), “The Determination of Optimum Radiation Therapy Plans”
- Oylum Şeker (co-advised with Tınaz Ekim), “The Selective Graph Coloring Problem”
- Emel Şeyma Küçükaşçı (co-advised with Mustafa Baydoğan), “Mathematical programming and statistical learning approaches for multiple instance learning”
- Abdullah Sarıduman (co-advised with A. Emre Pusane), “Design of LDPC Codes with Low Error Floor”
- Serkan Kalay, “Optimal Machine Configuration and Production Campaign Planning in Process Industries”
- Merve Gören, “Impact of Lead Time and Capacity Discretization in Time-Indexed Formulations for Production Planning Systems”

M.S. Students

- Tuğba Atmaca (co-advised with A. Tamer Ünal), “Development of an Object-Oriented Mathematical Modeling System,” (2011)
- Mücahit Çevik, “Optimal Decomposition of IMRT Fluence Maps Using Combinatorial Benders Cuts,” (2011)
- Abdullah Sarıduman (co-advised with A. Emre Pusane), “Integer Programming Based Analysis of Decoding Failures for LDPC Codes,” (2013)
- Merve Gören, “A Column Generation Approach for Evaluating Delivery Efficiencies of Collimator Technologies in IMRT Treatment Planning,” (2014)
- Engin Emir, “Effect of Bucket Size on Lead Time Discretization Error in Multi-Level Production Planning Systems,” (2015)
- Beste Başçiftçi, “A Stochastic Programming Approach for Optimizing Cryoprecipitate Collection Schedules,” (2015)

- Betül Ahat (co-advised with Tınaz Ekim), “Integer Programming Formulations and Benders Decomposition for Maximum Induced Matching Problem,” (2016)
- Fulya Terzi (co-advised with Semra Ağralı), “Mathematical Programming Approaches for a Generation Expansion Planning Problem in a Carbon-Constrained Environment” (2016)
- A. Çağrı Düzgün (co-advised with Tınaz Ekim), “The Maximum Clique Problem in Perfect Graphs”
- Bahadır Pamuk (co-advised with Semra Ağralı), “Lot-Sizing Models and Solution Algorithms for Co-Production Systems”

Presentations

- Betül Ahat, Tınaz Ekim, **Z. Caner Taşkın**, “Integer Programming Formulations and Benders Decomposition for Maximum Induced Matching Problem,” in *OR2016 – Annual International Conference of the German Operations Research Society*, Hamburg, Germany, September 2016
- **Z. Caner Taşkın**, Semra Ağralı, A. Tamer Ünal, Vahdet Belada, Filiz Gökten-Yılmaz, “Mathematical Programming-Based Sales and Operations Planning at Vestel Electronics,” in *EURO 2015*, Glasgow, UK, July 2015.
- Merve Bodur, Tınaz Ekim, **Z. Caner Taşkın**, “Decomposition Algorithms for Solving the Minimum Weight Maximal Matching Problem,” in *EURO 2013*, Rome, Italy, June 2013.
- Merve Bodur, Tınaz Ekim, **Z. Caner Taşkın**, “Decomposition Algorithms for Solving the Minimum Weight Maximal Matching Problem,” in *IIE Annual Conference and Expo 2012*, Orlando, FL, May 2012.
- **Z. Caner Taşkın**, Mucahit Cevik, “Combinatorial Benders Cuts for Decomposing IMRT Fluence Maps Using Rectangular Apertures,” in *IIE Annual Conference and Expo 2011*, Reno, NV, May 2011.
- **Z. Caner Taşkın**, J. Cole Smith, “A Branch-Cut-Price Algorithm for Solving a Class of Search Problems on General Graphs,” in *IIE Annual Conference and Expo 2010*, Cancun, Mexico, June 2010.
- **Z. Caner Taşkın**, J. Cole Smith, H. Edwin Romeijn, James F. Dempsey, “Optimal Multi Collimator Leaf Sequencing in IMRT Treatment Planning,” in *CORS-INFORMS International Meeting*, Toronto, Canada, June 2009.
- **Z. Caner Taşkın**, A. Tamer Ünal, “Tactical Level Planning in Float Glass Manufacturing with Co-Production, Random Yields and Substitutable Products,” in *IIE Annual Conference and Expo 2009*, Miami, FL, May 2009.
- **Z. Caner Taşkın**, J. Cole Smith, Shabbir Ahmed, Andrew J. Schaefer, “Cutting Plane Algorithms for Solving a Robust Edge Partition Problem,” in *INFORMS Computing Society Conference*, Charleston, SC, January 2009.
- **Z. Caner Taşkın**, J. Cole Smith, H. Edwin Romeijn, “Mixed-Integer Programming Techniques for Decomposing IMRT Fluence Maps Using Rectangular Apertures,” *INFORMS Computing Society Conference*, Charleston, SC, January 2009.
- **Z. Caner Taşkın**, J. Cole Smith, H. Edwin Romeijn, James F. Dempsey, “Optimal Multi Collimator Leaf Sequencing in IMRT Treatment Planning,” in *INFORMS Annual Meeting*, Washington, D.C., October 2008.

- **Z. Caner Taşkın**, J. Cole Smith, H. Edwin Romeijn, “Mixed-Integer Programming Techniques for Decomposing IMRT Fluence Maps Using Rectangular Apertures,” in *INFORMS Annual Meeting*, Washington, D.C., October 2008.
- Semra Ağralı, Joseph Geunes, **Z. Caner Taşkın**, “A Facility Location Model with Safety Stock Costs: Analysis of the Cost of Single-sourcing Requirements,” in *INFORMS Annual Meeting*, Washington, D.C., October 2008.
- **Z. Caner Taşkın**, J. Cole Smith, Shabbir Ahmed, Andrew J. Schaefer, “Cutting Plane Algorithms for Solving a Robust Edge Partition Problem,” in *INFORMS Optimization Society Conference*, Atlanta, GA, March 2008.
- **Z. Caner Taşkın**, J. Cole Smith, H. Edwin Romeijn, James F. Dempsey, “An Exact Algorithm for the Minimum Cardinality Leaf Sequence Problem in IMRT,” in *INFORMS Annual Meeting*, Seattle, WA, November 2007.
- **Z. Caner Taşkın**, J. Cole Smith, Shabbir Ahmed, Andrew J. Schaefer, “A Cutting Plane Algorithm for Solving a Robust Edge Partition Problem,” in *INFORMS Annual Meeting*, Seattle, WA, November 2007.
- **Z. Caner Taşkın**, J. Cole Smith, H. Edwin Romeijn, James F. Dempsey, “New Approaches to the Leaf Sequencing Problem in IMRT Treatment Planning,” in *INFORMS Annual Meeting*, Pittsburgh, PA, November 2006.
- Chunhua Men, H. Edwin Romeijn, **Z. Caner Taşkın**, James F. Dempsey, “Incorporating Delivery Efficiency into Radiotherapy Treatment Plan Optimization,” in *INFORMS Annual Meeting*, Pittsburgh, PA, November 2006.
- **Z. Caner Taşkın**, N. Serhat Aybat, “Analysis of a Two-Stage Supply Chain with Effort-Dependent Markovian Demand Structure,” in *YA/EM 2005*, İstanbul, Turkey, July 2005.
- Ilgaz Sungur, **Z. Caner Taşkın**, A. Tamer Ünal, İ. Kuban Altinel, “Development of an Object Oriented and Visual Mathematical Modeling and Optimization Environment,” in *EURO/INFORMS Joint International Meeting*, İstanbul, Turkey, July 2003.

Professional Activities

- Organizing Committee Member for WG 2016 – 42nd International Workshop on Graph-Theoretic Concepts in Computer Science (July 2016)
- Refereed papers for *Operations Research*, *IIE Transactions*, *INFORMS Journal on Computing*, *Networks*, *European Journal of Operational Research*, *Computational Optimization and Applications*, *Discrete Applied Mathematics*, *Computers and Operations Research*, *Journal of Scheduling*, *OR Spectrum*, *Journal of the Operational Research Society*, *4OR*, *OMEGA*, *Optimization Methods and Software*, *Optimization Letters*
- Faculty Advisor for Boğaziçi University IIE Student Chapter (2015 – present)
- Session Chair for YA/EM 2011
- Session Chair for IIE Annual Conference and Expo 2009
- Session Chair for INFORMS Annual Meeting (Fall 2008)
- Member of ICS: INFORMS Computing Society (2008 - present)
- Member of OPT: INFORMS Optimization Society (2007 - present)
- Member of INFORMS (2006 - present)
- Member of EURO: Association of European Operational Research Societies (2003 - present)