

Research Interest and Expertise

Cutting-edge optimization algorithms and software
Mathematical optimization modeling and algebraic languages
Mixed-integer optimization and mixed-integer second-order cone optimization
Black box optimization and auto-tuning for machine learning algorithms

Education

- 2012–2018 **Ph.D. in Industrial Engineering**, *Lehigh University*, Bethlehem, PA, GPA: 3.94/4.00.
2010–2012 **M.S. in Industrial Engineering**, *Bilkent University*, Ankara, Turkey, GPA: 3.71/4.00.
2005–2010 **B.S. in Industrial Engineering**, *Bilkent University*, Ankara, Turkey, GPA: 3.50/4.00.

Professional Work Experience


- 02/2018–
Present **SAS Institute**, *Operations Research Specialist*.
Open-source Python optimization modeling package, *sasoptpy*
 - Developed a new Python package to answer the growing need for Python tools for SAS/Optimization on cloud
 - Delivered a successful prototype in less than 2 months
 - Released 4 versions over 2018, gathering more than 120 downloads from August to December 2018
 - Strengthened the package capabilities by adding support for nonlinear and abstract modeling for big data instancesCustomer projects for SAS/OR Center of Excellence (CoE)
 - Restructured the resource scheduling solution for an existing customer project
 - Delivered a production-ready solution for the project and worked with customer to satisfy last-minute requirements
- 08/2015–
02/2018 **SAS Institute**, *Year-round Operations Research Intern*, Advisor: Imre Pólik.
Development of a second-order cone optimization solver
 - Developed warm-start and heuristic strategies for mixed-integer second-order cone optimization problems
- 06/2015–
08/2015 **SAS Institute**, *Operations Research Summer Fellow*, Advisors: Yan Xu, Joshua Griffin.
Hyperparameter optimization for machine learning problems
 - Developed a framework for hyperparameter optimization of machine learning algorithm parameters
 - Implemented a Bayesian Optimization approach with surrogate-based modeling for autotuning
- 06/2014–
08/2014 **SAS Institute**, *Operations Research Summer Fellow*, Advisor: Joshua Griffin.
PARIS: A parallel multi-start approach for discrete simulation-based optimization
 - Developed a state-of-art high performance simulation optimization framework
 - Enhanced an existing SBO algorithm with parallelization, multi-start and ranking-selection approaches
 - Provided numerical experiments to show dominance over existing algorithms
 - Reduced total solution time by 49% and decreased confidence interval by more than 54% on standard test set
- 2012–2014 **ORComplete**, *Collective Blog about Operations Research Studies*, www.orcomplete.com.
 - Started a community blog and an initiative social media project to write about contemporary OR topics
 - Reached more than 7000 visitors within first year
 - Organized 7 web seminars for operations research / industrial engineering students and practitioners
- 2011–2012 **Android Application Development**, *Locishare*.
 - Developed an Android OS based application for multimedia sharing on social networks
 - Maintained a web-service associated with the mobile application


Research Experience


- 2012–2018 **PhD Research**, *Lehigh University*, Bethlehem, PA, Advisor: Tamás Terlaky.
Optimization Algorithms and Software
 - Developed a novel warm-starting strategy for second-order cone optimization problems
 - Developed the first ever heuristic for mixed-integer second-order cone optimization problems
 - Worked on branching decisions in mixed-integer second-order cone optimization


- 2010–2013 **Master Thesis**, *Bilkent University*, Ankara, Turkey, Advisor: Nesim K. Erkip.
Title: Final Phase Inventory Management of Spare Parts Under Non-homogeneous Poisson Demand Rate
 ◦ Derived two heuristic approach to solve a real-world problem efficiently
- 2009–2010 **Undergraduate Research**, *Bilkent University*, Ankara, Turkey, Advisor: Murat Fadiloğlu.
 Undergraduate research project, PLPE (Production Line Performance Emulator)
 ◦ Developed an online web simulation tool (PLPE) for Small and Medium-Sized Enterprises



Publications

Jared Erickson and Sertalp B. Çay. *Optimization Modeling with Python and SAS®Viya®*. SAS Global Forum 2018, 1814-2018. 

Sertalp B. Çay, Imre Pólik, Tamás Terlaky. *The first heuristic specifically for mixed-integer second-order cone optimization*. Lehigh University ISE Technical Report, 18T-002, 2018. (In Review) 

Sertalp B. Çay, Imre Pólik, Tamás Terlaky. *Warm-start of interior point methods for second order cone optimization via rounding over optimal Jordan frames*. Lehigh University ISE Technical Report, 17T-006, 2017. (In Review) 

Sertalp B. Çay, Julio C. Góez, Tamás Terlaky. *Effects of Disjunctive Conic Cuts within a Branch and Conic Cut Algorithm to Solve Asset Allocation Problems*. Lehigh University ISE Technical Report, 16T-005, 2016. (Submitted) 

Sertalp Bilal Çay, Enes Bilgin, Cansu Çakır, Yasemin Arslan, Mehmet Fatih Cabioğlu, Barbaros Tansel. *Optimization on Internal Logistics Activities in BSH Washing Machine Factory*. Endüstri Mühendisliği, Vol. 21,3, pp. 25-38, Sep 2010. – (In Turkish with English abstract).  

Presentations

- 2018 SAS Viya Optimization Modeling Interface for Python,
 ◦ INFORMS Optimization Society Meeting, Denver, Colorado, April 2018 
- 2017 Warmstarting of primal-dual interior point methods for mixed-integer second-order cone optimization,
 ◦ INFORMS Annual Meeting, Houston, TX, October 2017 
 ◦ MOPTA 2017, Bethlehem, PA, August 2017 
 ◦ INFORMS Computing Society Meeting, Austin, TX, January 2017 
- 2015–2016 BAYES: Bayesian optimization solver for global optimization of black-box problems
 ◦ SAMSI Education and Outreach Undergraduate Workshop, Cary, NC, February 2017 
 ◦ Executive Demo, SAS Institute, Cary, NC, December 2016
- 2013–2016 Disjunctive conic and cylindrical cuts for portfolio optimization problems,
 ◦ INFORMS Annual Meeting, Nashville, TN, November 2016 
 ◦ MOPTA 2016, Bethlehem, PA, August 2016 
 ◦ INFORMS Annual Meeting (Invited Session), Philadelphia, PA, November 2015 
 ◦ ISMP 2015 (Invited Session), Pittsburgh, PA, July, 2015 
 ◦ CORS / INFORMS Joint Meeting, Montreal, Canada, June 2015 
 ◦ INFORMS Annual Meeting (Invited Session), San Francisco, CA, November 2014 
- 2014 PARIS: A parallel multi-start approach for discrete simulation-based optimization,
 ◦ SAS Institute Optimization Brainstorm, Cary, NC, August 2014
- 2014 Development of disjunctive conic and cylindrical Cuts for MISOCO and their applications to radiation therapy treatment optimization,
 ◦ *Poster Presentation: Intensity Modulated Radiation Therapy II*, Lehigh Uni., Bethlehem, PA, May 2014
- 2012 Final phase inventory management of spare parts under non-homogeneous Poisson demand rate,
 ◦ YA/EM (OR and IE Society) Annual Meeting, Doğuş University, Istanbul, July, 2012
 ◦ *Poster: Sixth Annual Workshop on Supply Chain and Logistics*, Bilkent University, Ankara, June 2012

Relevant Work Experience

- 08/2018– Present **Server Administrator**, *SAS Institute*, Cary, NC.
 ◦ Maintains the SAS Viya server for SAS Artificial Intelligence Center of Excellence (AI CoE) group
 ◦ Helps maintenance of the SAS/OR Viya cluster for SAS Optimization
- 10/2017– Present **Webmaster**, *INFORMS Optimization Society (IOS)*.
 ◦ Manages IOS website, Twitter and G+ accounts

- 09/2010– **Research Assistant**, *Bilkent University*, Ankara, Turkey.
- 06/2012 ◦ Researched on inventory theory, sponsored by TUBITAK (The Scientific and Tech. Research Council of Turkey)
- 09/2010– **Departmental Assistant / System Administrator**, *Bilkent University*, Ankara, Turkey.
- 06/2012 ◦ Developed and maintained the academic information systems and database
- Managed the department web-page for 2 years

Teaching

- 2015 **Guest Lecturer**, *Lehigh University*, ISE 407, Computational Methods in Optimization.
Topic: Computational Approaches in Interior Point Method
- 2015 **Senior Teaching and Lab Assistant**, *Lehigh University*, ISE 305/404, Simulation.
- 2013–2014 **Teaching and Lab Assistant**, *Lehigh University*, IE 305/404, Simulation.
Nominated for the *academic excellence as a teaching assistant award* by students
- 2012 **Teaching Assistant, Guest Lecturer**, *Lehigh University*, IE 425, Advanced Inventory Theory.

Awards and Certificates

- 2015 INFORMS Magna Cum Laude Award for *Lehigh University INFORMS Student Chapter*
- 2014–2018 P.C. Rossin Doctoral Fellow, Lehigh University
- 2014, 2015 SAS Operations Research Summer Fellow in the Operations Research R&D organization, SAS Institute
- 2012–2014 Dean’s Doctoral Assistantship, Lehigh University
- 2010–2012 Scholarship by the Scientific and Technological Research Council of Turkey for graduate studies
- 2010–2012 Full scholarship by Bilkent University for graduate studies
- 2010 Ranked as the 2nd best senior project in YA/EM 2010 National Student Project Competition in Turkey
- 2010,2012 High Honor standing at graduation from BS and MS program
- 2005–2010 Full scholarship by Bilkent University for undergraduate studies
- 2005 Ranked in top 0.1% among approximately 1.5 million attendees in University Entrance Exam (OSS)

Activities and Volunteer Experiences

- 2015–2016 Industrial and Systems Engineering Unit Representative in Lehigh Graduate Student Senate
- 2015–2016 PhD Representative in Lehigh ISE Council
- 2014–2015 President of Turkish Student Club at Lehigh University
- 2014–2015 President of Lehigh University INFORMS Student Chapter
- 2013–2017 INFORMS Annual Meeting Blogger, 2013—2017

Professional Membership

- 2013–Present INFORMS Member
- 2013–Present INFORMS Computing Society (ICS), INFORMS Optimization Society Member (IOS)
- 2013–2018 Lehigh University INFORMS Student Chapter Member
- 2013–2015 Association for Computing Machinery Student Member

Skills

Language

- Turkish Native
- English Advanced
- Japanese Basic

Computer Software and Languages

- Analytical AMPL, ARENA, C, C++, CPLEX, GAMS, Gurobi, Java, MATLAB, MINITAB, MOSEK, Python, SAS
- Frontend HTML, CSS, Javascript, JQuery, Ajax
- Backend PHP, SQL, Google Maps API, Facebook Connect API, OAuth
- Tools Git version control, SVN version control, L^AT_EX