Tülay Flamand

Contact Information

University of Colorado Denver
The Business School
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Research Interests

- Retail Analytics:
  - Shelf-space Management
  - Assortment Planning
- Exact and Heuristic Solution Methodologies:
  - Decomposition Techniques
  - Branch-and-Price Algorithm
  - Optimization-based Heuristic Approaches
- Enhanced Mathematical Programming Formulations
- Sports Analytics:
  - Team Formation Problem
- Optimization in Supply Chain Management
- The Transportation Problem
- Optimization in Mining Operations
- Optimization in Renewable Energy Design and Dispatch

Teaching Interests

Business Analytics
Python for Business Analytics
Supply Chain Analytics
Manufacturing & Service Operations Management
Stochastic Modeling
Linear & Integer Programming
Network Modeling
Management Science / Decision Sciences

Academic Positions

Assistant Professor **2023 – Present**
Business Analytics, Business School
University of Colorado Denver
Denver, CO

Assistant Professor **2016 – 2023**
Department of Economics & Business
Colorado School of Mines
Golden, CO

Education

Ph.D. Management Science **2016**
University of Massachusetts Amherst

M.S. Industrial Engineering **2010**
Istanbul Technical University, Istanbul, Turkey

B.S. Mathematical Engineering (High Honors Degree) **2007**
Yildiz Technical University, Istanbul, Turkey

Academic Experience

Teaching Experience

- BUSN 6630 E02 Management of Operations, ***Online***, University of Colorado Denver Business School, Spring 2024 (8-week)
- BUSN 6530 Data Analytics for Managers, University of Colorado Denver Business School, One-Year MBA Program, Fall 2023 (8-week)
- BUSN 6530 Data Analytics for Managers, University of Colorado Denver Business School, Fall 2023 (16-week)
- EBGN 525B Business Analytics, ***Online***, Colorado School of Mines, Fall 2020 (16-week), 2022 (8-week)
- EBGN 425A/525A Business Analytics, Colorado School of Mines, Spring 2020-2022
- EBGN 525A Business Analytics, Colorado School of Mines, Fall 2016-2021
- EBGN 461A/526A Stochastic Modeling, Colorado School of Mines, Spring 2021, 2022, 2023
- EBGN 559A Supply Chain Management, Colorado School of Mines, Spring 2017-2018
- OIM 301 Introduction to Operations Management, UMass Amherst, Fall 2013, Spring 2014
- OIM 301 Introduction to Operations Management, ***Online***, UMass Amherst, Fall 2014, Summer 2015
- OIM 240 Business Data Analysis, ***Online***, UMass Amherst, Spring 2015, 2016

Teaching Assistant

- OIM 301 Introduction to Operations Management, UMass Amherst, Fall 2014
- OIM 310 Manufacturing & Service Operations Methods, UMass Amherst, Spring 2013, 2014
- OIM 410 Business Process Optimization, UMass Amherst, Fall 2014
- OIM 412 Supply Chain Management, UMass Amherst, Fall 2013
- SCH-MGMT 825X Integer Programming (Graduate level), UMass Amherst, Spring 2015

Research Assistant **2011 – 2016**
University of Massachusetts Amherst
Isenberg School of Management
Department of Operations & Information Management

Publications

(* represents PhD advisees)

Aranoglu F*., Flamand T., Duzgun S., Martinez G., Smith N. (2024). Integrated system dynamics modeling and optimization for artisanal and small-scale gold supply chains, *IISE Transactions*.
https://doi.org/10.1080/24725854.2024.2315166

Muniz M*., Flamand T. (2024). A Column Generation approach for the team formation problem, *Computers & Operations Research*, 161:106406.
https://doi.org/10.1016/j.cor.2023.106406

Abdelaziz F.B., Maddah B., Flamand T., Azar J. (2024). Store-Wide space planning balancing impulse and convenience, *European Journal of Operational Research*, 312(1): 211–226.
https://doi.org/10.1016/j.ejor.2023.06.027

Flamand T., Ghoniem A., Maddah B. (2023). Store-wide shelf space allocation with ripple effects driving traffic, *Operations Research*, 71(4): 1073–1092.
https://doi.org/10.1287/opre.2023.2437

Flamand T., Iori M., Haouari M. (2023). The transportation problem with packing constraints, *Computers & Operations Research*, 157: 106278.
https://doi.org/10.1016/j.cor.2023.106278

Olmez Turan M*., Flamand T. (2023). Optimizing investment and transportation decisions for the European natural gas supply chain, *Applied Energy*, 337: 120859.
https://doi.org/10.1016/j.apenergy.2023.120859

Hirwa J.A*., Zolan A.J., Becker W., Flamand T., Newman A. M. (2023). Optimizing design and dispatch of a resilient renewable energy microgrid for a South African hospital, *Applied Energy*, 348: 121438.
https://doi.org/10.1016/j.apenergy.2023.121438

Muniz M*., Flamand T. (2023). Sports analytics for balanced team-building decisions, *Journal of the Operational Research Society*, 74(8): 1892–1909.
https://doi.org/10.1080/01605682.2022.2118634

Muniz M*., Flamand T. (2022). A weighted network clustering approach in the NBA, *Journal of Sports Analytics*, 8(4): 251–275.
https://doi.org/10.3233/JSA-220584

Aranoglu F*., Flamand T., Duzgun S. (2022). Analysis of artisanal and small-scale gold mining in Peru under climate impacts using system dynamics modeling, *Sustainability*, 14(12): 7390.
https://doi.org/10.3390/su14127390

Nesbitt P*., Sipeki L., Flamand T., Newman A. M. (2021). Optimizing underground mine design with method-dependent precedences, *IISE Transactions*, 53(6): 643–656.
https://doi.org/10.1080/24725854.2020.1823534

Flamand T., Ghoniem A., Haouari M., Maddah B. (2018). Integrated assortment planning and store-wide shelf space allocation: An optimization-based approach, *Omega*, 81: 134–149.
https://doi.org/10.1016/j.omega.2017.10.006

Flamand T., Ghoniem A., Maddah B. (2016). Promoting impulse buying by allocating retail shelf space to grouped product categories, *Journal of the Operational Research Society*, 67(7): 953–969.
https://doi.org/10.1057/jors.2015.120

Ghoniem A., Flamand T., Haouari M. (2016). Exact solution methods for a generalized

assignment problem with location/allocation considerations, *INFORMS Journal on Computing*, 28(3): 589–602.
https://doi.org/10.1287/ijoc.2016.0700

Ghoniem A., Flamand T., Haouari M. (2016). Optimization-based very large-scale neighborhood search for generalized assignment problems with location/allocation considerations, *INFORMS Journal on Computing*, 28(3): 575–588.
https://doi.org/10.1287/ijoc.2016.0703

Book Chapters

Flamand, T., Ghoniem, A., Maddah, B. (2023). A solver-free heuristic for store-wide shelf space allocation. In: Ghoniem, A., Maddah, B. (eds) Retail Space Analytics. International Series in Operations Research & Management Science, vol 339. Springer, Cham.
https://doi.org/10.1007/978-3-031-27058-1_2

Under Review/Revision Manuscripts

Wales J.G., Zolan A.J., Flamand T., Newman A. M., Decomposing a renewable energy design and dispatch model, *under the first round of revision.*

Olmez Turan M*., Gilbert B., Flamand T., How good are weather shocks for identifying energy elasticities? A LASSO-IV approach to European natural gas demand, *under the first round of revision.*

Working Papers

(* represents PhD advisees, ** represents masters students)

Muniz M*., Flamand T., Hill J., A balanced multi-team formation problem under synergy, superstar and preference considerations in a basketball setting

Miyaoka G.**, Flamand T., Newman A. M., Pilatus Aircraft optimizes inventory management

Store-wide shelf space allocation under health safety considerations, with Ghoniem A., Maddah B.

Branch-and-price methodology for the transportation problem with packing constraints, with Haouari M., Iori M., Baldacci R.

Simulation-optimization of spare part inventory policy for the maintenance of a mining equipment, with Golbasi O.

Grants

01/2020 - 12/2022: National Science Foundation (NSF) Grant: Mapping, Modeling and Disrupting Illicit Gold Supply Chains in Peru, PI: Dr. Nicole Smith, **Co-PI:** Dr. Tulay Flamand, Co-PI: Dr. Sebnem Duzgun, Colorado School of Mines. Award: $673,754

Conferences & Presentations

Attended to the INFORMS Business Analytics Conference, April 16-18, 2023, Aurora CO.

Attended to the INFORMS Annual Meeting, October 15-18, 2023, Phoenix, AZ.

The Transportation Problem with Packing Constraints, EURO Conference (Virtual), July 14, 2021.

Retail Analytics on Store-Wide Shelf-Space Allocation, INFORMS Annual Meeting, in-person, Anaheim, CA, October 26, 2021.

Retail Analytics on Store-Wide Shelf-Space Allocation, INFORMS Annual Meeting, Virtual, October 27, 2021.

Invited seminar speaker, Retail Analytics on Store-Wide Shelf-Space Allocation, Seminar for the Lubar School of Business, UW-Milwaukee, October 15, 2021.

Invited guest lecturer, MEGN688 Advanced Integer Optimization, Lecture for the branch-and-price algorithm, April 2020.

Attended to the Virtual INFORMS Annual Meeting, November 7-13 2020. (PhD advisee Megan Muniz presented "Sports analytics for optimizing team-building decisions of an NBA Team").

Retail Analytics on Store-Wide Shelf-Space Allocation, Seminar for the Leeds School of Business, University of Colorado, Boulder, September 6, 2019.

A Branch-and-Price Algorithm for the Hitchcock-Koopmans Problem with Reusable Transportation Assets, INFORMS Annual Meeting, Phoenix, AZ, November 7, 2018.

Analytics for Store-Wide Shelf-Space Management, INFORMS Annual Meeting, Phoenix, AZ, November 5, 2018.

Optimal Gate Assignment Under the Consideration of Airport Retailing, INFORMS Annual Meeting, Phoenix, AZ, November 4, 2018.

Column Generation Approaches for the Optimal Deployment Problem, INFORMS Optimization Society Conference, Denver, CO, March 24, 2018.

Retail Analytics on Store-Wide Shelf-Space Allocation, Seminar for Rocky Mountain Chapter of INFORMS, Golden, CO, March 15, 2018.

Retail Analytics on Store-Wide Shelf-Space Allocation, INFORMS Annual Meeting, Houston, TX, October 24, 2017.

Retail Analytics for Store-Wide Shelf-Space Management, POMS Conference, Seattle, WA, May 7, 2017.

Store-wide Shelf Space Analytics to Optimize Impulse Buying, INFORMS Annual Meeting, Nashville, TN, November 16, 2016.

Optimization Approaches For Generalized Assignment Problems with Location/Allocation Considerations, INFORMS Annual Meeting, Philadelphia, PA, November 4, 2015.

Very Large-Scale Neighborhood Search for Generalized Assignment Problems with Location/Allocation Considerations, INFORMS Computing Society Conference, Richmond, VA, January 12, 2015.

Optimizing a Class of Generalized Assignment Problems with Location/Allocation Considerations, INFORMS Annual Meeting, San Francisco, CA, November 12, 2014.

Invited Panelist at the UMass Amherst Student Chapter of INFORMS panel discussion:

"The Process of Building a Teaching Portfolio", March 2014.

Store-wide Shelf Space Optimization to Maximize Impulse Buying, INFORMS Annual Meeting, Minneapolis, MN, October 8, 2013.

Impulse Purchase Maximization via Layout-based Shelf Space Allocation, POMS Conference, Denver, CO, May 3, 2013.

Professional Service

- Associate Editor, INFOR, 2023 - Present
- Chaired session in INFORMS Annual Meeting: Data Analytics and Optimization 2021 (both in-person and virtual), 2023 (in-person)
- INFORMS Student Affairs Committee (SAC) Chair, 2020 - 2021
- INFORMS Student Affairs Committee (SAC) Member, 2017 - 2019
- Organized session in INFORMS-ALIO International Conference: Operations Planning in Supply Chains, 2019
- Core Faculty, Operations Research with Engineering (ORwE) PhD Program, Colorado School of Mines
- Faculty Fellow, Payne Institute, Colorado School of Mines, 2016 - 2023
- Chaired session in INFORMS Annual Meeting: Revenue Management, Pricing, 2017
- Chaired session in INFORMS Annual Meeting: Military Applications, 2017
- Chaired session in INFORMS Annual Meeting: Retail Analytics & Optimization session, 2015, 2016.
- Referee for journals: OR, POMS, EJOR, JORS, IISE Transactions, Omega, IJOO, Advances in Operations Research, Annals of Operations Research, ISERC conference proceedings, INFORMS TSL Conference, Journal of Sports Analytics, Management Decision, Letters in Spatial and Resource Sciences
- Coordinator, AACSB Assurance of Learning Assessment Module: OIM 301 sections, Fall 2013, Spring 2014
- UMass Student Chapter of INFORMS: Event Coordinator, 2013 - 2016
- UMass Student Chapter of INFORMS: Secretary, 2012 - 2013
- UMass Student Chapter of INFORMS: Vice President, 2011 - 2012

Department and University Committees

- Data Science Artificial Intelligence Symposium Organization Committee Member, University of Colorado Denver, Spring 2024 - Present
- Academic Integrity Committee Member, University of Colorado Denver, Fall 2023 - Present
- Assessment of Learning Committee Member, University of Colorado Denver Business School, Fall 2023 - Present
- One-Year MBA Internship Faculty Advisor, University of Colorado Denver Business School, Spring 2024 - Present
- Department Head Search Committee Member, Department of Economics and Business, Fall 2021
- Business Analytics Faculty Search Committee Member, Department of Economics and Business, Fall 2021
- Research Council Member, Colorado School of Mines, Fall 2021 - Spring 2023
- Graduate Council Member, Colorado School of Mines, Spring 2020
- Committee member for developing Business Engineering and Management Science undergraduate program, Colorado School of Mines, Fall 2019 - Spring 2023
- Engineering Technology Management (ETM) Program Committee, Colorado School of Mines
- ETM Admissions Committee, Colorado School of Mines
- ORwE Program Committee, Colorado School of Mines
- ORwE Admissions Committee, Colorado School of Mines

- Faculty Search Committee Member, Department of Economics and Business, Fall 2017

Qualification Exam Committees

- John Ayaburi, Operations Research with Engineering, PhD, Colorado School of Mines, Qual II Exam Committee Member (January 2023)
- Karoline Hood, Operations Research with Engineering, PhD, Colorado School of Mines, Qual II Exam Committee Member (December 2022)
- James Grymes, Operations Research with Engineering, PhD, Colorado School of Mines, Qual II Exam Committee Member (December 2021)
- John Cox, Operations Research with Engineering, PhD, Colorado School of Mines, Qual II Exam Committee Member (January 2021)
- Lois Kamga-Ngameni, Operations Research with Engineering, PhD, Colorado School of Mines, Qual II Exam Committee Member (August 2020)
- Kate Anderson, Advanced Energy Systems, PhD, Colorado School of Mines, Qual II Exam Committee Member (June 2020)
- Peter Nesbitt, Qual II Exam Committee Member, (December 2018)

Doctoral Committees

- Maysaa Jaafar, Neoma Business School, France, Committee Member (defended in May 2024)
- Madeline Macmillan, Advanced Energy Systems, PhD, Colorado School of Mines, Committee Member (defended in November 2023)
- Kehinde Abiodun, Mineral Energy Economics, PhD, Colorado School of Mines, Committee Member (defended in July 2022)
- John Cox, Operations Research with Engineering, PhD, Colorado School of Mines, Committee Member (defended in June 2022)
- Kate Anderson, Advanced Energy Systems, PhD, Colorado School of Mines, Committee Chair (defended in November, 2021)
- Lois Kamga-Ngameni, Operations Research with Engineering, PhD, Colorado School of Mines, Committee Member (defended in May, 2021)
- Oluwaseun Ogunmodede, Operations Research with Engineering, PhD, Colorado School of Mines, Committee Chair (defended in February, 2021)
- Jesse Wales, Operations Research with Engineering, PhD, Colorado School of Mines, Committee Member, (defended in July, 2020)
- Patrick O'Reilly, Mineral and Energy Economics, PhD, Colorado School of Mines, Committee Member (defended in November, 2019)

Professional Memberships

- The Institute for Operations Research and the Management Sciences (INFORMS)
- INFORMS Analytics Society
- INFORMS Computing Society (ICS)
- INFORMS Optimization Society
- INFORMS Manufacturing & Service Operations Management Society (MSOM)
- Rocky Mountain Chapter of INFORMS
- INFORMS Junior Faculty Interest Group
- INFORMS Women in ORMS (WORMS)

Awards & Honors

- Outstanding Research Award, University of Colorado Denver Business School (May 2024)
- Research Productivity Award, University of Colorado Denver Business School (May 2024)
- Excellence in Teaching Award, Department of Economics and Business, Colorado

School of Mines (May 2021)
- Open Educational Resources (OER) Incentive Grant ($250), Colorado School of Mines (May 2021)
- Excellence in Teaching Award, Department of Economics and Business, Colorado School of Mines (May 2018)
- Outstanding Researcher Award, Isenberg School of Management, UMass Amherst (April 2016)
- UMass Amherst INFORMS Student Chapter Outstanding Service Award (April 2016)
- Doctoral Consortium, POMS Annual Meeting, Orlando (April, 2016)
- Summer Dissertation Research Fellowship, UMass Amherst (February 2016)
- Dissertation Research Award, Isenberg School of Management, UMass Amherst (June 2015)
- Doctoral Student Colloquium, INFORMS Annual Meeting, San Francisco (2014)
- INFORMS Cum Laude Student Chapter Annual Award (2014)
- INFORMS Magna Cum Laude Student Chapter Annual Award (2011-2013)
- Scientific and Technological Research Council of Turkey (TUBITAK) fellowship (2007-2009)
- Distinctive Graduate, Yildiz Technical University (2007)
- Turkish American Women Scholarship Fund (2006)

Undergraduate Advisees

- Elijah Knodel, Applied Mathematics and Statistics, Colorado School of Mines, Mines Undergraduate Research Fellowship (MURF) Program Advisor, Sports Analytics for Team-Building Decisions for an NBA Team, Fall 2021 - Spring 2022

- Amandin Chyba Rabeendran, Applied Mathematics, Colorado School of Mines, MURF Program Advisor, Evaluation of the Impact of Government Controls on the Spread of COVID-19 in Colorado by Data Analytics on COVID-19 Cases, Social Distancing and Mobility, Fall 2020 - Spring 2021

- Chiang Cheng Siew, Petroleum Engineering, Colorado School of Mines, MURF Program Advisor, Evaluation of the Impact of Government Controls on the Spread of COVID-19 in Colorado by Data Analytics on COVID-19 Cases, Social Distancing and Mobility, Fall 2020

PhD Advisees

- Peter Nesbitt, Operations Research with Engineering PhD Program, (co-advisor), graduated in Spring 2020.
Dissertation: Optimization-based Procedures for Underground Mine Planning
Assistant Professor, Naval Postgraduate School, Fall 2020 - Present

- Megan Muniz, Operations Research with Engineering PhD Program, graduated in Summer 2022.
Dissertation: Sports Analytics and Optimization for Team Formation Problems
Air Force AI Liaison, DAF / MIT AI Accelerator, Fall 2022 - Present

- Merve Olmez Turan, Mineral and Energy Economics PhD Program, graduated in Summer 2022.
Dissertation: Supply Chain Analysis in Mineral and Energy Markets
Researcher 3 Model Engineering, National Renewable Energy Laboratory, Summer 2022 - Present.

- Jusse Aline Hirwa, Mineral and Energy Economics PhD Program, (co-advisor), graduated in Summer 2022.
Dissertation: Applications of Optimization and Statistical Models to the Energy Sector
Data Scientist, Chevron, Summer 2022 - Present

- Fatih Aranoglu, Earth Resources Development Engineering PhD Program, (co-advisor), graduated in Fall 2023.
Dissertation: Systems Thinking Approaches to Artisanal and Small-Scale Gold Mining Supply Chains in Peru
Graduate Engineer, Paterson & Cooke, Summer 2024 - Present