

# A. İrfan Mahmutoğulları

Postdoctoral Researcher

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## AREAS OF INTEREST

- Combinatorial Optimization, Stochastic Programming, Robust Optimization, Machine Learning.

## EXPERIENCE

### Postdoctoral Researcher

DTAI, Department of Computer Science, **KU Leuven**

Oct 2022 – Present

Leuven, Belgium

- Conducting research as a part of the EU-funded [CHAT-Opt](#) project (Promoter: [Prof. Tias Guns](#))
- Leading Decision-Focused Learning subgroup of three postdocs and two Ph.D. student

### Lecturer

Department of Industrial Engineering, **TED University**

Feb 2019 - Oct 2022

Ankara, Turkey

- Served as the director of the Engineering Management (Mar 2019 - Nov 2022) and Industrial Engineering (Apr 2022 - Nov 2022) Master of Science programs
- Served as a member of the Graduate School Board (Mar 2019 - Nov 2022)

### Research Fellow

The School of Industrial and Systems Engineering, **Georgia Institute of Technology**

Oct 2017 - Jul 2018

Atlanta, GA, USA

- Funded by International Doctoral Research Grant (No: [2214](#)) of the Scientific and Technological Research Council of Turkey (TUBITAK) to conduct research under the supervision of [Prof. Shabbir Ahmed](#)

### Research and Teaching Assistant

Department of Industrial Engineering, **Bilkent University**

Sep 2011 - Jan 2019

Ankara, Turkey

- Funded by Scholarship for Graduate Studies (Grant No: [2211](#)) of the Scientific and Technological Research Council of Turkey (TUBITAK)

## EDUCATION

### Ph.D. in Industrial Engineering and Operations Research

Department of Industrial Engineering, **Bilkent University**

Sep 2013 - Jan 2019

Ankara, Turkey

- Thesis title: Multi-stage Risk-Averse Mixed-integer Programming
- Advisors: [Prof. Özlem Çavuş](#) and [Prof. M. Selim Aktürk](#)
- Graduated with a full grade of 4.00 out of 4.00

### M.S. in Industrial Engineering and Operations Research

Department of Industrial Engineering, **Bilkent University**

Sep 2011 - Jun 2013

Ankara, Turkey

- Thesis title: Competitive Hub Location Problem
- Advisor: [Prof. Bahar Yetiş Kara](#)
- Graduated with a high honor grade of 3.81 out of 4.00

### B.S. in Industrial Engineering

Department of Industrial Engineering, **Bilkent University**

Sep 2007 - Jun 2011

Ankara, Turkey

- Graduated with a high honor grade of 3.73 out of 4.00

## PUBLICATIONS

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### Journal Papers

- Score Function Gradient Estimation to Widen the Applicability of Decision-Focused Learning. Silvestri M., Berden S., Signorelli G., Mahmutoğulları A. İ., Mandi J., Amos B., Guns T., & Lombardi M., 2025. ***Journal of Artificial Intelligence Research***, Accepted for Publication.
- Vulnerability-based Prioritization in Disaster Planning Efforts: Benefits and Trade-offs. Mahmutoğulları A. İ., Şahin H. & Sahinyazan F.G., 2025. ***INFOR: Information Systems and Operational Research***, Accepted for Publication.
- Perception-based Constraint Solving for Sudoku Images. Mulamba M., Mandi J., Mahmutoğulları A. İ. & Guns T., 2024. ***Constraints***, Accepted for Publication.
- Risk-Averse Hub Location: Formulation and Solution Approach. Kargar K. & Mahmutoğulları A. İ., 2022. ***Computers & Operations Research***, 143, 105760.
- Two Lagrangian Relaxation-based Heuristics for Vertex Coloring Problem. Mahmutoğulları A. İ., 2020. ***Cumhuriyet Science Journal***, 41(2), 493-505.
- The Value of Multi-stage Stochastic Programming in Risk-averse Unit Commitment under Uncertainty. Mahmutoğulları A. İ., Ahmed S., Çavuş Ö. & Aktürk M. S., 2019. ***IEEE Transactions on Power Systems***, 34(5), 3667-3676.
- An Exact Solution Approach for Risk-averse Mixed-integer Multi-stage Stochastic Programming Problems. Mahmutoğulları A. İ., Çavuş Ö. & Aktürk M. S., 2019. ***Annals of Operations Research***, Accepted for Publication.
- Bounds on Risk-averse Mixed-integer Multi-stage Stochastic Programming Problems with mean-CVaR. Mahmutoğulları A. İ., Çavuş Ö. & Aktürk M. S., 2018. ***European Journal of Operational Research***, 266(2), 595-608.
- Hub Location Under Competition. Mahmutoğulları A. İ. & Kara B. Y., 2016. ***European Journal of Operational Research***, 250(1), 214-225.
- Hub Location Problem with Allowed Routing between non-hub Nodes. Mahmutoğulları A. İ. & Kara B. Y., 2015. ***Geographical Analysis***, 47(4), 410-430.

### Peer-reviewed Conference Papers

- Solver-Free Decision-Focused Learning for Linear Optimization Problems. Berden S., Mahmutoğulları A. İ., Tsouros D. & Guns T., 2025. ***NeurIPS - the Annual Conference on Neural Information Processing Systems***.
- Minimizing Surrogate Losses for Decision-Focused Learning using Differentiable Optimization. Mandi J., Mahmutoğulları A. İ., Berden S. & Guns T., 2025. ***ECAI - the European Conference on Artificial Intelligence***, Accepted.
- An Efficient Structured Perceptron for NP-Hard Combinatorial Optimization Problems. Véjar B., Aglin G., Mahmutoğulları A. İ., Nijssen S., Schaus P. & Guns T., 2024, ***CPAIOR - Integration of Constraint Programming, Artificial Intelligence, and Operations Research***, 21, 253-262.

### Under Review

- Contextual Quantile Demand Predictions for Robustness in Vehicle Routing Problem. Mahmutoğulları A. İ., Mandi J. & Guns T. ***INFORMS Journal on Computing***.
- Synchronized Road Unblocking and Relief Material Distribution for Effective Disaster Response. Şahin H., Mahmutoğulları A. İ. & Kadan M. ***Journal of Heuristics***.

## REVIEWING DUTIES

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- Mathematical Programming, Transportation Research Series B: Methodological, European Journal of Operational Research, INFORMS Journal on Computing, Health Care Management Science, Annals of Operations Research, Socio-Economic Planning Sciences, RAIRO - Operations Research, Transactions on Machine Learning Research

## [PRESENTATIONS / TALKS / CONFERENCES](#)

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- **Dagstuhl Seminar:** Machine Learning Augmented Algorithms for Combinatorial Optimization Problems, 2024, Wadern, Germany.
- **EURO 2024:** Invited Talk: Data Science Meets Optimization Stream, Copenhagen, Denmark
- **ORBEL 38:** The annual conference of the Belgian Operational Research Society, 2024, Antwerp, Belgium.
- **Workshop OR4Logistics,** FEB KU Leuven, 2023, Leuven, Belgium
- **Gluren bij de buren** LIM-workshop, KU Leuven Institute for Mobility, 2023, Leuven, Belgium.
- **ACP SUMMER SCHOOL** (Poster and Spotlight Presentations) on Machine Learning for Constraint Programming, 2023 Leuven, Belgium.
- **SMiLe 2023:** Spring workshop on Mining and Learning (Poster and Spotlight Presentations), 2023, Sint-Michielsgestel, the Netherlands.
- **ORBEL 37:** The annual conference of the Belgian Operational Research Society, 2023, Liège, Belgium.
- **YAEM 39:** The annual conference of Operations Research and Industrial Engineering 2019, Ankara, Turkey.
- **MIP 2018:** Mixed Integer Programming Workshop (Poster presentation), Greenville, SC, USA.
- **INFORMS 2017** Annual Meeting, Houston, TX, USA.
- **INOC 2013:** International Network Optimization Conference 2013, Tenerife, Spain.
- **EWGLA 2013:** THE EURO Working Group on Locational Analysis XX, 2013, Ankara, Turkey.
- **EWGLA 2011:** THE EURO Working Group on Locational Analysis XIX 2011, Nantes, France.

## [TEACHING](#)

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### [TED University \(Instructor\)](#)

- **Undergraduate Courses:**
  - IE332 - Mathematical Modeling & Optimization III (6 ECTS; 2019S, 2020S, 2021S, 2022S)
  - IE464 - Distribution Logistics (5 ECTS; 2018F, 2019F, 2020F, 2021F)
  - IE491-492 - Senior Project I - II (6+6 ECTS; 2019S&F, 2020S&F, 2021S&F, 2022S)
- **Graduate Courses:**
  - IE527 - Logistics (7.5 ECTS; 2018F, 2019F, 2020F)
  - IE547 - Modelling and Analysis of Uncertainty (7.5 ECTS; 2020F, 2021F)
  - EM590 - Graduation Project (12.5 ECTS; 2020S, 2021S)
  - EM591 - Pre-thesis seminar (5 ECTS; 2020S, 2020F, 2021S)
  - EM592 - Thesis I - II (30+30 ECTS; 2019F, 2020F, 2021S&F, 2022S)

### [Bilkent University \(Teaching Assistant\)](#)

- **Undergraduate Courses:**
  - IE202 - Introduction to Modeling and Optimization (6.5 ECTS; 2013S)
  - IE303 - Modeling and Methods in Optimization (5 ECTS; 2011F, 2012F)
  - IE325 - Stochastic Models (5 ECTS; 2015F, 2016F)
  - IE400 - Principles of Engineering Management (5 ECTS; 2014F)
  - IE432 - Quantitative Risk Management (5 ECTS; 2015S, 2016S)
- **Graduate Courses:**
  - IE505 - Mathematical Programming (5 ECTS; 2013F)

## THESIS SUPERVISION

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- Investigating the Relationship Between Decision-Focused Learning and the Value of Stochastic Solution. Duygun E., 2025. *Master of Science in Engineering, Computer Science, KU Leuven*. Promoter: Guns T., Supervisor: Mahmutoğulları A. İ.
- Robust Mathematical Optimization Using Quantile Predictions. Bernaerts G., 2024. *Master of Science in Engineering, Computer Science, KU Leuven*. Promoter: Guns T., Supervisor: Mahmutoğulları A. İ.
- Scalable Decision-Focused Learning for Vehicle Routing Problems. Michailidis K., 2023. *Master of Science in Engineering, Computer Science, KU Leuven*. Promoter: Guns T., Supervisor: Mahmutoğulları A. İ.
- The Problem of Simultaneous Routing of Road Cleaning and Relief Vehicles for an Effective Planning Method after Natural Disaster. Kadan M., 2022. *Master of Science in Industrial Engineering, TOBB University of Economics and Technology*. Supervisor: Şahin H., Co-supervisor: Mahmutoğulları A. İ.

## HONORS AND AWARDS

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- **Oct 2017 - Jul 2018:** The Scientific and Technological Research Council of Turkey (TUBITAK) International Doctoral Research Fellowship Program (Grant No: [2214](#)).
- **Jun 2018:** Research Excellence Award in Ph.D. Studies, Bilkent University Department of Industrial Engineering.
- **Sep 2011 - Aug 2019:** The Scientific and Technological Research Council of Turkey (TUBITAK) Scholarship for Graduate Studies Program (Grant No: [2211](#)).
- **Jun 2011:** B.S. Graduation with High Honor Degree.
- **Sep 2007 - June 2011:** Bilkent University Comprehensive Scholarship.

## SOFTWARE SKILLS

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**Optimization** : Gurobi, CPLEX, JuMP, GAMS  
**Softwares**

**Programming** : Python, Java, Matlab  
**Languages**

## ORGANIZATION

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- Organization team member, ACP SUMMER SCHOOL 2023 on Machine Learning for Constraint Programming, July 2023, KU Leuven, Leuven, Belgium. <https://school.a4cp.org/summer2023>
- Local organizing committee member, Fifth International Conference on Set Optimization with Applications to Economics, Finance, Statistics and Game Theory, May 30 - June 3, 2022. Bilkent University, Ankara, Turkey.  
<https://sites.google.com/view/sofa2022/>

## CERTIFICATIONS

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- May 2020: [Deep Learning Specialization](#) of deeplearning.ai on Coursera
- Jul 2020: [TensorFlow in Practice Specialization](#) of deeplearning.ai on Coursera

## LANGUAGES

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- Turkish (Native)
- English (Advanced)
- Dutch (Basic)

## REFERENCES

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Available upon request