Tonguç Yavuz

PhD Industrial Engineering

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Professional Experience

- **Kadir Has University** — Istanbul, Turkey
  Assistant Professor – Industrial Engineering — *2026–Present*
- **İstanbul Bilgi University** — Istanbul, Turkey
  Assistant Professor – Industrial Engineering — *2021–2026*
  - Designed and taught courses in Operations Research, Simulation, Stochastic Approaches and Large Scale Optimization.
  - Supervised multiple projects in scheduling, supply chain planning and stochastic programming using CPLEX and Gurobi.
- **TSF Engineering & Machinery** — Istanbul, Turkey
  Founder – Decision Support Systems Developer — *2013–Present*
  - Developed optimization-based scheduling and timetabling systems for universities and private sector clients.
  - Implemented algorithms in Java and Python, integrated commercial solvers (Gurobi, CPLEX).

Education

- **Özyeğin University** — Istanbul, Turkey
  Ph.D. in Industrial Engineering — *2021*
  - Supervisor: Prof. Dr. O. Erhun Kundakcıoğlu
  - Co-Supervisor: Assoc. Prof. Dr. İhsan Yanıkoğlu
  - Thesis: Testing and Scheduling Applications Under Uncertainty
- **University of Florida** — Gainesville, FL, USA
  Visiting Scholar — *August 2019 – September 2020*
  - Host: Prof. Dr. Panos Pardalos
- **FMV Işık University** — Istanbul, Turkey
  M.Sc. in Industrial Engineering and Operations Research — *2016*
  - Supervisor: Prof. Dr. S. Tankut Atan
  - Thesis: An Optimization-Based Decision Support System for Dormitory Placement at Işık University
- **FMV Işık University** — Istanbul, Turkey
  B.Sc. in Industrial Engineering — *2013*

Technical Skills

- Optimization: Mixed-Integer Programming, Large-Scale Decomposition (Benders, Dantzig-Wolfe, Column Generation), Heuristics
- Programming: Java, Python, Gurobi, CPLEX, SQL
- Decision Support Systems, Scheduling, AI Integration

Publications

- **Journal Articles**
  - **T. Yavuz**, O.E. Kundakcıoğlu, T. Ünlüyurt, 2019. "Exact and Heuristic Approaches to Detect Failures in Failed k-out-of-n Systems". *Computers & Operations Research* 112: 104752.
  - İ. Yanıkoğlu, **T. Yavuz**, 2022. "Robust Tardiness Minimization on Unrelated Parallel Machines with Sequence Dependent Setup and Uncertain Processing Times". *European Journal of Operational Research* 301 (3), 875–895.
  - T. Atan, **T. Yavuz**, B. Çavdaroğlu, 2024. "Graph-based Heuristics for Rest Difference Minimization". *Journal of the Operational Research Society*.
- **Book Chapters**
  - **T. Yavuz**, Z. Özcan, 2025. "A Fuzzy Multi-criteria Decision-Making Approach for Course Scheduling in Higher Education." In: *INFUS 2025 Proceedings*.
  - Z. Düzgit, Z. Özcan, **T. Yavuz**, 2025. "A Fuzzy AHP-TOPSIS Approach for Dynamic Due Date Assignment in Machine Scheduling." In: *INFUS 2025 Proceedings*.
  - Z. Özcan, **T. Yavuz**, 2024. "A Theoretical Analysis of Fuzzy MCDM Methods for Healthcare Resource Allocation Under Uncertainty." In: *INFUS 2024 Proceedings*.
- **Working Papers**
  - **T. Yavuz**, T. Atan, B. Çavdaroğlu. "Round-Robin Scheduling with Regard to Rest Differences: A Novel Branch-And-Price Method and Heuristic Approach", in preparation.
  - **T. Yavuz**, T. Ünlüyurt. "Optimal Drone-Based Inspection Strategies for Serial and Parallel System Connectivity", in preparation.

Conference Presentations

- **Z. Özcan**, **T. Yavuz**, 2025, "A Course Scheduling Optimization Model Based on Stakeholder Preferences Derived from Fuzzy MCDM", *GJCIE 2025 – Global Joint Conference on Industrial Engineering and Its Applications*, Istanbul, Turkey (Abstract Presentation)
- **T. Yavuz**, **Z. Özcan**, 2025, "Decision Making under Uncertainty: An Educational Approach Using Monte Carlo Simulation", *YAEM 2025 – Gazi University*, Ankara, Turkey (Proceedings Paper)

- **T. Yavuz**, T. Atan, B. Çavdaroğlu, 2024, "A Comprehensive Approach to Round-Robin Scheduling: Novel Solutions for Total Rest Difference and Rest Balance Optimization", *YAEM 2024 – Karadeniz Technical University*, Trabzon, Turkey (Proceedings Paper)
- **T. Yavuz**, T. Ünlüyurt, 2024, "Determining Reliable Routes to Safe Zones after Disasters Using Drones", *YAEM 2024 – Karadeniz Technical University*, Trabzon, Turkey (Proceedings Paper)
- **T. Yavuz**, T. Atan, B. Çavdaroğlu, 2023, "Round-Robin Scheduling with Regard to Rest Differences: A Novel Branch-And-Price Method and Heuristic Approach", *INFORMS*, Phoenix, USA
- **T. Yavuz**, S. Gül, O.E. Kundakcıoğlu, 2019, "A Stochastic Programming Approach for Operating Room Capacity Allocation among Indoctors and Outdoctors", *Sixth International Conference on Computational Biomedicine (CBM)*, Florida, USA
- **T. Yavuz**, S. Gül, O.E. Kundakcıoğlu, 2018, "A Stochastic Programming Approach for Operating Room Capacity Allocation among Indoctors and Outdoctors", *INFORMS*, Phoenix, USA
- **T. Yavuz**, T. Atan, 2014, "FMV Işık University Dormitory Placement System", *YAEM*, Bursa, Turkey

Projects in Private Sector

- **AI-Enhanced Dietitian Support Platform** — Istanbul, Turkey
  Lead Developer (Ongoing) — *2025 – Present*
  - Developing an AI-assisted platform for dietitians to automate client messaging, appointment management and payment tracking through social media channels.
  - Integrating natural language processing, customer database management and analytics dashboards to reduce manual workload and improve client experience.
- **Multi-Objective University Dorm Allocation System** — Istanbul, Turkey
  Designer / Consultant — *2025 – Present*
  - Designing a multi-objective decision support system for a university's dormitory placement to simultaneously maximize student satisfaction and meet administrative constraints.
  - Currently in the requirements gathering and planning phase with university stakeholders.
- **Pharmacy Customer & Inventory Management System** — Istanbul, Turkey
  Developer — *2024 – 2025*
  - Designed and implemented a decision support system for pharmacies enabling customer tracking, stock monitoring and automatic stock deduction upon sales.
  - Integrated inventory control and reporting features to improve operational efficiency and minimize stock-outs.
- **Funthemental Talent System** — Istanbul, Turkey
  Developer — *2014 – 2021*
  - Created a decision support system that analyzes the physical and psychological features to recommend sport branches for young candidates.
- **Decision Support System for Üsküdar University Course Scheduling** — Istanbul, Turkey
  Developer — *2013 – 2015*
  - Developed a decision support system that solves course timetabling problem for Üsküdar University by considering university rules, staff demands, and class capacities.

Research Projects

- **ARDEB 1001 – TÜBİTAK** İstanbul, Turkey
  Researcher *2024 – Ongoing*
  - Project: Determining Reliable Routes Effectively using Drones after a Disaster
- **ARDEB 2214-A – TÜBİTAK** Gainesville, Florida, USA
  Principal Coordinator *2019 – 2020*
  - Project: Optimization of Long-Term Operation Reliability and Cost in Complex Systems
- **ARDEB 3501 – TÜBİTAK** İstanbul, Turkey
  Researcher *2018 – 2019*
  - Project: Inventory Management and Transshipment Policies for Drugs with No Annual Contract in Pharmaceutical Supply Chain Planning under Uncertainty
  - Principal Coordinator: Dr. O. Erhun Kundakcıoğlu

Service Activities

- **Reviewer for the following journals & conferences**
  - European Journal of Operational Research
  - Probability in the Engineering and Informational Sciences
  - Journal of Global Optimization
  - Optimization Letters
  - International Conference on Machine Learning, Optimization, and Data Science (LOD 2019 & LOD 2020)
- **Administrative Duties**
  - Özyeğin University Internship Report Grading Program
    * I developed a decision support system that evaluates the reports in a fair and conflict-free environment by hiding the names of the students and asking fixed questions to help TAs on grading. A standard feedback report for grading is forwarded to the students automatically after grading. I have been offering consultation for this system to Dr. Dilek Günneç Danış since 2017.
  - FMV Işık University Dorm Allocation
    * I developed a decision support system that solves a dorm allocation problem to satisfy students' preferences as much as possible by considering university rules and room capacities. Although it was my master thesis, the system was used by the university under my consultancy for 4 years.
  - Proctor Scheduling Duty
    * I made the scheduling of research assistants and laboratory assistants for proctoring in midterm and final exams for all engineering departments in FMV Işık University for 2 years.