

## Assoc. Prof. GÜLŞAH KARAKAYA

### Personal Information

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### International Researcher IDs

ScholarID: b6JGn1kAAAAJ

ORCID: 0000-0001-9061-103X

Publons / Web Of Science ResearcherID: ABB-7047-2020

ScopusID: 36668792600

Yoksis Researcher ID: 165112

### Education Information

Post Doctorate, Singapore University of Technology and Design, Pillar of Engineering Systems and Design, Singapore  
2014 - 2014

Doctorate, Middle East Technical University, Graduate School of Natural and Applied Sciences, Endüstri Mühendisliği  
(Dr), Turkey 2009 - 2013

Postgraduate, Middle East Technical University, Graduate School of Natural and Applied Sciences, Endüstri Mühendisliği  
(YI) (Tezli), Turkey 2007 - 2009

Undergraduate, Middle East Technical University, Faculty of Engineering, Department of Industrial Engineering, Turkey  
2003 - 2007

### Foreign Languages

English, C1 Advanced

### Dissertations

Doctorate, Decision support for multi-attribute auctions, Middle East Technical University, Graduate School of Natural  
and Applied Sciences, Endüstri Mühendisliği (Dr), 2013

Postgraduate, Approaches for multi-attribute auctions, Middle East Technical University, Graduate School of Natural and  
Applied Sciences, Endüstri Mühendisliği (YI) (Tezli), 2009

### Research Areas

Operational Research, Quantitative Methods, Multiobjective Optimization, Multi Criteria Decision Making

### Academic Titles / Tasks

Associate Professor, Middle East Technical University, Faculty of Economic and Administrative Sciences, Department of Business Administration, 2022 - Continues  
Assistant Professor, Middle East Technical University, Faculty of Economic and Administrative Sciences, Department of Business Administration, 2018 - 2022  
Assistant Professor, Middle East Technical University, Faculty of Economic and Administrative Sciences, Department of Business Administration, 2016 - 2018  
Research Assistant, Middle East Technical University, Faculty of Engineering, Department of Industrial Engineering, 2007 - 2013

## **Academic and Administrative Experience**

Deputy Head of Department, Middle East Technical University, Faculty of Economic and Administrative Sciences, Department of Business Administration, 2022 - Continues  
Middle East Technical University, Faculty of Economic and Administrative Sciences, Department of Business Administration, 2016 - 2016

## **Courses**

DECISION ANALYSIS: TOOLS AND METHODS, Undergraduate, 2022 - 2023, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019, 2017 - 2018  
MANAGEMENT SCIENCE, Undergraduate, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019, 2017 - 2018  
MANAGEMENT SCIENCE, Postgraduate, 2022 - 2023, 2021 - 2022, 2019 - 2020, 2018 - 2019, 2017 - 2018  
SIMULATION & QUANTITATIVE MODELS IN BUSINESS , Undergraduate, 2020 - 2021, 2019 - 2020, 2018 - 2019, 2016 - 2017  
OPTIMIZATION METHODS FOR MANAGEMENT, Postgraduate, 2020 - 2021, 2017 - 2018, 2015 - 2016

## **Advising Theses**

Azizoğlu M., Karakaya G., Discrete time/cost trade-off project scheduling problem - an application to the Ministry of Health projects, Postgraduate, Ö.AKBUDAK(Student), 2022  
Karakaya G., WIDE-BODY AIRCRAFT SELECTION USING MULTI-CRITERIA DECISION MAKING METHODS, Postgraduate, H.GÖKALP(Student), 2022  
Karakaya G., Information theoretic measure based interactive approaches to multi-criteria sorting problems, Doctorate, A.ÖZARSLAN(Student), 2021  
Karakaya G., DEVELOPMENT OF A DECISION SUPPORT SYSTEM FOR EMPLOYEE SCHEDULING PROBLEM IN HOSPITALITY SECTOR: A CASE STUDY IN A TURKISH FIRM, Postgraduate, E.BERK(Student), 2019  
Karakaya G., Akın Ateş M., Development of an ahp based supplier evaluation system: A case study in a Turkish defense firm, Postgraduate, B.KARTAL(Student), 2019  
Karakaya G., Gönül M. S., A new pairwise comparison scale for analytic hierarchy process, Postgraduate, B.CAN(Student), 2019  
Karakaya G., Automatic license plate recognition system location selection, Postgraduate, B.Gör(Student), 2018  
KARAKAYA G., Interactive evolutionary approaches to multi-objective feature selection, Postgraduate, M.Özmen(Student), 2016

## **Designed Lessons**

Karakaya G., Simulation & Quantitative Models in Business, Undergraduate, 2016 - 2017  
Karakaya G., Optimization Methods for Management, Postgraduate, 2015 - 2016

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Finding preferred solutions under weighted Tchebycheff preference functions for multi-objective integer programs**  
KARAKAYA G., Köksalan M.  
European Journal of Operational Research, vol.308, no.1, pp.215-228, 2023 (SCI-Expanded)
- II. **Interactive Approaches to Multiple Criteria Sorting Problems: Entropy-Based Question Selection Methods**  
Ozarslan A., KARAKAYA G.  
INTERNATIONAL JOURNAL OF INFORMATION TECHNOLOGY & DECISION MAKING, vol.22, no.01, pp.279-312, 2023 (SCI-Expanded)
- III. **Evaluating solutions and solution sets under multiple objectives**  
KARAKAYA G., Köksalan M.  
European Journal of Operational Research, vol.294, no.1, pp.16-28, 2021 (SCI-Expanded)
- IV. **Fibonacci Series-Based Pairwise Comparison Scale for Analytic Hierarchy Process**  
Can Yıldırlm B., KARAKAYA G., Gönül M. S.  
International Journal of Information Technology and Decision Making, vol.20, no.3, pp.959-986, 2021 (SCI-Expanded)
- V. **A New Interactive Algorithm for Continuous Multiple Criteria Problems: A Portfolio Optimization Example**  
KARAKAYA G., Sakar C. T.  
International Journal of Information Technology and Decision Making, vol.20, no.1, pp.371-398, 2021 (SCI-Expanded)
- VI. **A new interactive approach to multiple criteria sorting problems: An application in energy sector**  
ÖZARSLAN A., KARAKAYA G.  
JOURNAL OF THE FACULTY OF ENGINEERING AND ARCHITECTURE OF GAZI UNIVERSITY, vol.36, no.4, pp.2239-2254, 2021 (SCI-Expanded)
- VII. **Interactive approaches for biobjective problems with progressively changing solution sets**  
KARAKAYA G., Koksalan M.  
INTERNATIONAL TRANSACTIONS IN OPERATIONAL RESEARCH, vol.28, no.1, pp.356-375, 2021 (SCI-Expanded)
- VIII. **Estimating the form of a decision maker's preference function and converging towards preferred solutions**  
KARAKAYA G., Koksalan M.  
IIEE TRANSACTIONS, vol.52, no.6, pp.651-664, 2020 (SCI-Expanded)
- IX. **An interactive approach with filtering to find a preferred solution of a decision maker**  
TUNCER ŞAKAR C., KARAKAYA G.  
JOURNAL OF THE FACULTY OF ENGINEERING AND ARCHITECTURE OF GAZI UNIVERSITY, vol.34, no.4, pp.1987-2005, 2019 (SCI-Expanded)
- X. **Interactive evolutionary approaches to multiobjective feature selection**  
ÖZMEN m., KARAKAYA G., KÖKSALAN M. M.  
INTERNATIONAL TRANSACTIONS IN OPERATIONAL RESEARCH, vol.25, no.3, pp.1027-1052, 2018 (SCI-Expanded)
- XI. **Interactive algorithms for a broad underlying family of preference functions**  
KARAKAYA G., KÖKSALAN M. M., AHİPAŞAOĞLU S. D.  
EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, vol.265, no.1, pp.248-262, 2018 (SCI-Expanded)
- XII. **An information theoretic approach to select alternate subsets of predictors for data-driven hydrological models**  
TAORMİNA R., GALELLÌ S., KARAKAYA G., Ahipasaoglu S. D.  
JOURNAL OF HYDROLOGY, vol.542, pp.18-34, 2016 (SCI-Expanded)
- XIII. **An interactive approach for Bi-attribute multi-item auctions**  
KARAKAYA G., Koksalan M.  
ANNALS OF OPERATIONS RESEARCH, vol.245, pp.97-119, 2016 (SCI-Expanded)

- XIV. **Identifying (Quasi) Equally Informative Subsets in Feature Selection Problems for Classification: A Max-Relevance Min-Redundancy Approach**  
Karakaya G., GALELLI S., AHİPAŞAOĞLU S. D., TAORMİNA R.  
IEEE TRANSACTIONS ON CYBERNETICS, vol.46, no.6, pp.1424-1437, 2016 (SCI-Expanded)
- XV. **An Evolutionary Algorithm for Finding Efficient Solutions in Multi-Attribute Auctions**  
Köksalan M., KARAKAYA G.  
INTERNATIONAL JOURNAL OF INFORMATION TECHNOLOGY & DECISION MAKING, vol.13, no.3, pp.649-673, 2014 (SCI-Expanded)
- XVI. **An interactive approach for multi-attribute auctions**  
Karakaya G., Köksalan M.  
DECISION SUPPORT SYSTEMS, vol.51, no.2, pp.299-306, 2011 (SCI-Expanded)

## Articles Published in Other Journals

- I. **Editorial for “Recent advances and applications of multi-objective optimization”**  
KARAKAYA G., Lokman B.  
EURO Journal on Decision Processes, vol.12, 2024 (ESCI)
- II. **Predicting the response to bDMARD treatment in RA: Then what?**  
Tuncer Şakar C., Karakaya G., Bilgin E., Kiliç L., Kalyoncu U.  
Ulusal Romatoloji Dergisi, vol.14, pp.87-93, 2022 (Scopus)
- III. **OPTIMIZATION OF PLATE RECOGNITION SENSOR LOCATIONS: A CASE STUDY IN TURKEY**  
Gör B., Karakaya G.  
JOURNAL OF INDUSTRIAL ENGINEERING, vol.32, no.1, pp.147-163, 2021 (Peer-Reviewed Journal)
- IV. **An interactive ranking-based multi-criteria choice algorithm with filtering: Applications to university selection**  
KARAKAYA G., TUNCER ŞAKAR C.  
METU Studies in Development, 2019 (Peer-Reviewed Journal)

## Refereed Congress / Symposium Publications in Proceedings

- I. **Two multi-criteria decision making methods for selection of wide-body passenger aircraft**  
GÜNEŞ H. G., KARAKAYA G.  
XVIII. International Balkan and Near Eastern Congress Series on Economics, Business and Management, Ohrid, Macedonia, 26 - 27 November 2022
- II. **A new mathematical model based approach to multi-criteria stock selection problem**  
KURT A., TÜRKÜN KAYA B., KARAKAYA G.  
41. Yöneylem Araştırması ve Endüstri Mühendisliği Kongresi (YA/EM 2022), Denizli, Turkey, 26 October 2022
- III. **Interactive approaches to converge preferred solutions under distance-based value functions**  
KÖKSALAN M. M., KARAKAYA G.  
INFORMS 2022 Annual Meeting, Indiana, United States Of America, 16 - 19 October 2022
- IV. **A new interactive algorithm for multiple criteria sorting problems under a variety of preference functions**  
Karakaya G., Köksalan M. M.  
26th International Conference on MCDM, Portsmouth, England, 26 June - 01 July 2022, pp.30
- V. **Interactive Algorithms for Finding Preferred Solutions under Weighted Tchebycheff Preference Functions**  
Karakaya G., Köksalan M. M.  
22nd Conference of the International Federation of Operational Research Societies (IFORS 2021), Seoul, South Korea, 23 - 27 August 2021, pp.56

- VI. **Veri Zarflama Analizi İle Türkiye’de Taşkın Riskli Alanların Belirlenmesi**  
YEĞİN M., KENTEL ERDOĞAN E., KARAKAYA G., DEMİR E.  
40. Yöneylem Araştırması ve Endüstri Mühendisliği Kongresi (YA/EM 2021), İstanbul, Turkey, 5 - 07 July 2021, pp.32
- VII. **İki Amaçlı Sağlık Projelerinin Çizelgelenmesi İçin Yaklaşımlar**  
AKBUDAK Ö., AZİZOĞLU M., KARAKAYA G.  
40. Yöneylem Araştırması ve Endüstri Mühendisliği Kongresi (YA/EM 2021), İstanbul, Turkey, 5 - 07 July 2021, pp.31-32
- VIII. **A Decision Support System for Employee Scheduling Problem in Hospitality Sector: A Case Study in a Turkish Firm**  
Ünsal E. B., KARAKAYA G.  
XIII. International Balkan and Near Eastern Congress Series on Economics, Business and Management, 5 - 06 October 2019, pp.644-671
- IX. **Comparison of solutions under a weighted Thcebycheff function**  
KARAKAYA G., KÖKSALAN M. M.  
25th International Conference on MCDM, 16 - 21 June 2019
- X. **An interactive sorting approach based on information theoretic measure**  
ÖZARSLAN A., KARAKAYA G.  
25th International Conference on MCDM, 16 - 21 June 2019
- XI. **Alternatiflerin sınıflandırılması için yeni bir etkileşimli yaklaşım**  
ÖZARSLAN A., KARAKAYA G.  
39th YAEM National Conference, Turkey, 12 - 14 June 2019
- XII. **Estimating the form of a decision maker’xxs preferencefunction and converging to preferred solutions**  
KÖKSALAN M. M., KARAKAYA G.  
INFORMS Annual Meeting 2018 Phoenix, 4 - 07 November 2018
- XIII. **A filtering-enabled interactive algorithm to find preferred solutions of the decision maker**  
KARAKAYA G., TUNCER ŞAKAR C.  
INFORMS Annual Meeting 2018 Phoenix, 4 - 07 November 2018
- XIV. **Analitik hiyerarşi süreci için yeniikili karşılaştırma ölçeği**  
YILDIRIM B. C., KARAKAYA G., GÖNÜL M. S.  
38th YAEM National Conference, Turkey, 26 - 29 June 2018
- XV. **Karar vericinin tercih ettiği çözümü bulmak içinfiltreleme yardımcı interaktif bir yöntem**  
TUNCER ŞAKAR C., KARAKAYA G.  
38th YAEM National Conference, Turkey, 26 - 29 June 2018
- XVI. **Interactive Approaches to Multi-objective Feature Selection**  
ÖZMEN M., KARAKAYA G., KÖKSALAN M. M.  
INFORMS Houston, 22 - 25 October 2017
- XVII. **Sağlık turizmi ve destek mekanizmaları: dünya örnekleri ile türkiye uygulamalarının kıyaslanması**  
AYDIN AKTAŞ A., KARAKAYA G., GÖNÜL M. S.  
37th YAEM National Conference, Turkey, 5 - 07 July 2017
- XVIII. **Interactive algorithms for a wide variety of preference functions**  
KARAKAYA G., KÖKSALAN M. M., AHİPAŞAOĞLU S. D.  
INFORMS Annual Meeting 2016 Nashville, 13 - 16 November 2016
- XIX. **Identifying quasi equally informative subsets in multi objective feature selection problems for classification**  
KARAKAYA G., GALELLİ S., AHİPAŞAOĞLU S. D., TAORMİNA R.  
28th European Conference on Operational Research, 3 - 06 July 2016
- XX. **An interactive evolutionary approach to multi objective feature selection**  
KÖKSALAN M. M., Özmen M., KARAKAYA G.  
28th European Conference on Operational Research, 3 - 06 July 2016

- XXI. **A preference based approach to multi objective feature selection**  
ÖZMEN M., KARAKAYA G., KÖKSALAN M. M.  
INFORMS Annual Meeting 2015 Philadelphia, 1 - 04 November 2015
- XXII. **İki amaçlı çok ürünlü açık arttırmalar için etkileşimli bir yaklaşım**  
KARAKAYA G., KÖKSALAN M. M.  
35th YAEM National Conference, Turkey, 9 - 11 September 2015
- XXIII. **An interactive approach for bi attribute multi item auctions under quasiconvex preference functions**  
KARAKAYA G., KÖKSALAN M. M.  
23rd International Conference on MCDM, 3 - 07 August 2015
- XXIV. **A minimum redundancy maximum relevance input variable selection approach to identify equally informative subsets for hydrological models**  
KARAKAYA G., GALELLİ S., AHİPAŞAOĞLU S. D.  
World Environmental and Water Resources Congress, 17 - 21 May 2015
- XXV. **An entropy based input variable selection approach to identify equally informative subsets for data driven hydrological models**  
KARAKAYA G., TAORMİNA R., GALELLİ S., AHİPAŞAOĞLU S. D.  
European Geosciences Union (EGU) General Assembly 2015, 12 - 15 April 2015
- XXVI. **An Approach for Multi attribute Multi item Reverse Auctions**  
Karakaya G., Köksalan M. M.  
33rd YAEM National Conference, İstanbul, Turkey, 26 - 28 June 2013
- XXVII. **Decision Support for Multi attribute Multi item Reverse Auctions**  
KARAKAYA G., KÖKSALAN M. M.  
22nd International Conference on MCDM, 17 - 21 June 2013
- XXVIII. **Decision Support for Multi attribute Multi item Reverse Auctions**  
KARAKAYA G., KÖKSALAN M. M.  
21st International Symposium on Mathematical Programming (ISMP), 19 - 24 August 2012
- XXIX. **An Interactive Approach for Multi attribute Multi item Reverse Auctions**  
KARAKAYA G., KÖKSALAN M. M.  
21st International Conference on MCDM, 13 - 17 June 2011
- XXX. **An Approach for Multi attribute Reverse Auctions**  
KARAKAYA G., KÖKSALAN M. M.  
20th International Conference on MCDM, 21 - 26 June 2009

## Supported Projects

KARAKAYA G., KÖKSALAN M., Project Supported by Higher Education Institutions, Çok Kriterli Problemlerde Karar Vericinin Tercih Fonksiyonunun Tahmin Edilmesi İçin Yaklaşımlar, 2018 - 2019  
KARAKAYA G., KÖKSALAN M. M., Project Supported by Higher Education Institutions, Çok Kriterli Tam Sayılı Optimizasyon Problemlerinde Etkin Çözümlerin Bulunması İçin Yaklaşımlar, 2016 - 2016

## Memberships / Tasks in Scientific Organizations

INFORMS Section on Multiple Criteria Decision Making (MCDM), Board Member, 2019 - 2021, United States Of America

## Metrics

Publication: 50

Citation (WoS): 90

Citation (Scopus): 128

H-Index (WoS): 5

H-Index (Scopus): 5

## **Awards**

KARAKAYA G., Genç Arařtırmacı Başarı Ödülleri, ODTÜ Geliřtirme Vakfı, December 2017