Assoc. Prof. Dr. Funda Samanlioglu

Dr. Funda Samanlioglu is an Associate Professor in the Department of Industrial Engineering at Kadir Has University, Turkey. After receiving her Ph.D. degree in Industrial Engineering from Clemson University (USA), prior to her academic position at Kadir Has University, she worked as an Assistant Professor in the Department of Industrial and Systems Engineering at North Carolina A&T State University (USA). She is an author or co-author of over 50 technical papers. Her current research interests are in multi-criteria decision making, humanitarian relief logistics, meta-heuristics, and applied operations research.

Seminar: An Interactive Memetic Algorithm for the Multi-objective Traveling Salesman Problem

Abstract

In this research, a preference-based, interactive memetic random-key genetic algorithm (PIMRKGA) is developed and used to find (weakly) Pareto optimal solutions to a symmetric multi-objective travelling salesman problem. Since there are a large number of solutions to these kinds of problems, to reduce the computational effort and to provide more desirable and meaningful solutions to the decision maker, this research focuses on using interactive input from the user to explore the most desirable parts of the efficient frontier instead of trying to reproduce the entire frontier. Here, users define their preferences by selecting among five classes of objective functions and by specifying weighting coefficients, bounds, and optional upper bounds on indifference tradeoffs. This structure is married with the memetic algorithm – a random-key genetic algorithm hybridized by local search. The resulting methodology is an iterative process that continues until the decision maker is satisfied with the solution. The research concludes with case studies utilizing different scenarios to illustrate possible related implementations of the methodology.