



## Barbaros Tansel Memorial Lecture Series

İhsan Doğramacı Bilkent University  
Department of Industrial Engineering  
Ankara, Turkey

**Date:** April 30, 2014

**Time:** 13:30-19:30

**Location:** Mithat Çoruh Auditorium

We invite researchers and practitioners to participate in the first Barbaros Tansel Memorial Lecture Series. The Barbaros Tansel Lecture Series is named in honor of the late Prof. Dr. Barbaros Tansel, a former member of the Department of Industrial Engineering, who had an irrepressible enthusiasm for research, teaching, and learning. He was a source of inspiration for students and colleagues alike.

### Program Schedule:

Time	Activity
13:30-13:45	Opening Remarks (Prof. Dr. M. Selim Aktürk)
13:45-15:00	Talk by <b>Prof. Dr. Martine Labbé</b> (Université Libre de Bruxelles) Bilevel Programming and Price Optimization Problems
15:00-15:30	Coffee Break
15:30-16:15	Talk by <b>Prof. Dr. Murat Köksalan</b> (Middle East Technical University) Multiobjective Combinatorial Optimization: Some Approaches
16:15-17:00	Talk by <b>Prof. Dr. Ceyda Oğuz</b> (Koç University) Operational Problems in Container Terminals
17:30-19:30	Reception (Location: Rektörlük Konutu No. 49)

There will be no registration fee for event. For those who are interested in participating in the activity, please send an e-mail to [memorial.bilkent.ie@gmail.com](mailto:memorial.bilkent.ie@gmail.com) not later than **April 23, 2014**. A limited number of rooms have been reserved at the university dorms and guest housing to accommodate the participants. Please notify your need for an accommodation as soon as possible and **not later than April 23, 2014** by sending an e-mail to the same address.

### Organization Committee:

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## About Prof. Dr. Barbaros C. Tansel



Prof. Dr. Barbaros Tansel was born in Ankara on the 10th of January 1952. He completed his high-school education in Robert College. Prof. Tansel graduated from the Industrial Engineering Department of Middle East Technical University in 1974. He got his master and doctorate degrees from the Industrial and Systems Engineering Department of the University of Florida in 1976 and 1979, respectively. Before joining the Industrial Engineering Department of Bilkent University, Prof. Tansel worked as a faculty member in the University of Florida, Middle East Technical University, the University of Southern California, and the Georgia Institute of Technology. Upon joining Bilkent University as a faculty member in 1991, Prof. Tansel became an associate professor in 1993 and a professor in 2002. Prof. Tansel chaired the Department of Industrial Engineering between 1999 and 2006. Prof. Tansel was granted several awards and research funds from national and international organizations and agencies. Prof. Tansel authored and co-authored a significant number of papers and book chapters in national and international journals and books. He supervised more than 40 master and doctorate theses. Prof. Tansel was a highly-respected researcher and a well-established academician in his field. Moreover, he was a talented dancer who shared his experience in dancing with Bilkenters and dance lovers. He is survived by his wife, Elif Tansel, and his son, Doğa Tansel.

# **Bilevel Programming and Price Optimization Problems**

**Martine Labbé**

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## **Abstract**

Consider a general pricing model involving two levels of decision-making. The upper level (leader) imposes prices on a specified set of goods or services while the lower level (follower) optimizes its own objective function, taking into account the pricing scheme of the leader. This model belongs to the class of bilevel optimization problems where both objective functions are bilinear.

In this talk, we review this class of hierarchical problems from both theoretical and algorithmic points of view and then focus on some special cases. Among others, we present complexity results, identify some polynomial cases and propose mixed integer linear formulations for those pricing problem.

In the first problem considered, tolls must be determined on a specified subset of arcs of a multicommodity transportation network. In this context the leader corresponds to the profit-maximizing owner of the network, and the follower to users travelling between nodes of the network. The users are assigned to shortest paths with respect to a generalized cost equal to the sum of the actual cost of travel plus a money equivalent of travel time.

An extension of the Network Pricing Problem is obtained by optimizing the design of the network and the set of tolls on a subset of open arcs, given that users travel on shortest paths.

The third problem is a special case of the Network Pricing Problem in which the taxable arcs are connected and form a path, as occurred in toll highways. When users travel on at most one taxable subpath, the problem can be reformulated in a Network Pricing Problem on an auxiliary clique graph. Interestingly this problem is also equivalent to that of determining optimal prices for bundles of products given that each customer will buy the bundle that maximizes her/his own utility function.

## **Biography**

Martine Labbé is a full professor at the Université Libre de Bruxelles (ULB), see <http://homepages.ulb.ac.be/~mlabbe/>. She is Professor of Operations Research at the Computer Science Department of the Faculty of Sciences. She received her Ph.D. in 1985 from ULB. She spent 1986-1988 at the Université Louis Pasteur in Strasbourg as visiting professor, and from 1989 to 1991 she was assistant professor at Erasmus Universiteit Rotterdam. In 1992, she joined ULB as a research associate of the FNRS, the Belgian national science foundation. Since 1995, she holds an academic position at ULB and from 2007 to 2011, she was Dean of the Faculty of sciences. Her main research area is combinatorial optimization, including graph theory and integer programming problems and with a particular emphasis on location, network design and pricing problems. She served on the editorial boards of *Discrete Optimization*, *Journal on Combinatorial Optimization*, *Operations Research*, *Operations Research Letters* and *Transportation Science*. She is now the Editor in Chief of the *EURO Journal on Computational Optimization*. She is the author or coauthor more than 100 papers published in international journals. In 2007-2008, she was president of EURO, the Association of European Operational Research Societies. She is, for 2014 and 2015, Vice-Chair of the SIAM Activity Group on Optimization (SIAG/OPT).

# **Multiobjective Combinatorial Optimization: Some Approaches**

**Murat Köksalan**

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## **Abstract**

Combinatorial optimization problems are computationally difficult to solve even for a single criterion. The problem becomes harder when multiple objectives are considered. There has been an increasing interest in multiobjective combinatorial optimization (MOCO) problems in recent years.

In this talk, I will discuss various aspects of MOCO problems and present our approach that fits a smooth function to approximate the nondominated set using a few nondominated points. I will demonstrate the approach and its implementation on various MOCO problems. I will then discuss extensions to converge the most preferred point or to find a representative set of nondominated points for various multi-objective problems.

## **Biography**

Murat Köksalan is a professor and the chairman in the Department of Industrial Engineering, Middle East Technical University. He has worked as a visiting professor at SUNY Buffalo, Purdue University, and Aalto University. The MCDM Gold Medal of the International Society on Multiple Criteria Decision Making, the Science Award of the Parlar Foundation, first prizes at four INFORMS Case Competitions are among the awards he received. He is the founding president of INFORMS Section on MCDM and the President Elect of the International Society on MCDM. His academic interests include multiple criteria decision making, combinatorial optimization, heuristic search, combinatorial auctions, and preparing teaching cases.

## **Operational Problems in Container Terminals**

**Ceyda Oğuz**

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### **Biography**

Ceyda Oguz is Professor of Industrial Engineering in College of Engineering at Koc University, Istanbul, Turkey. Before joining Koc University, she was a faculty member in the School of Business at The Hong Kong Polytechnic University, Hong Kong, from 1993 to 2004. She received her Ph.D. degree in Industrial Engineering from Bilkent University, Turkey, in 1993 and holds an M.S. degree (Bilkent University) and a B.S. degree (Middle East Technical University) both in Industrial Engineering. Prof. Oguz conducts research in the areas of bioinformatics, logistics, and scheduling in manufacturing and computer systems. Her expertise includes algorithm design and system modeling as well as providing optimizing and/or approximate solutions to the complex systems by means of computational methods. Prof. Oguz has participated in several research projects, which were funded by TUBITAK and jointly by the Hong Kong and the European governments, related to above fields. She has published more than 40 papers in ISI listed journals with high impact factors. Prof. Oguz is also active in the professional front. Apart from being a member of organizing and program committee of several conferences and workshops, she successfully organized a workshop on scheduling at Koc University in 2006. She also took part in founding the “EURO Working Group on the Operational Research in Computational Biology, Bioinformatics and Medicine” (EURO-CBBM) and acts as the secretary and the treasurer of the group since 2006.