

## Guest Editorial Preface

# Special Issue on Advanced Prediction and Assessment Techniques

Ferhan Çebi, İstanbul Technical University, İstanbul, Turkey

Dilay Çelebi, İstanbul Technical University, İstanbul, Turkey

Gül T. Temur, Bahcesehir University, İstanbul, Turkey

Today's blistering changes on competitive and technological environments are rapidly changing the importance of data and information in operational processes in the value chains for improving competitive advantage. Advanced prediction and assessment techniques help organizations enhance their operational processes and make effective decisions for the future. Today's organizations apply the advanced techniques to their business problems to explore the relationship among data, to identify patterns for finding opportunities, to assess current and future issues, create new information, to predict the future, and to make quicker and data-driven decisions in future. The main objective of this special issue is to address business applications of some of those recent advanced prediction and assessment techniques and provide an insight on how these contribute to organizations on performing of operations and competitiveness.

This special issue consists of one invited and five selected papers, which originally were presented and discussed at the 16th Production Research Symposium between the dates October 12-14, 2016 and subsequently extended, reviewed, and revised.

The research paper, Performance Comparison of Two Recent Heuristics for Green Time Dependent Vehicle Routing Problem, by Mehmet Soysal, Mustafa Çimen, Mine Ömürgönülşen and Sedat Belbağ addresses a green Time Dependent Capacitated Vehicle Routing Problem which is especially confronted in urban distribution planning. The paper presents a performance comparison of two recent heuristics, the classical Restricted Dynamic Programming and the Simulation Based Restricted Dynamic Programming heuristics, for the addressed problem that explicitly accounts for time dependent vehicle speeds and fuel consumption (emissions).

The study "Predicting Success of Ensemble Algorithms in A Banking Sector" by Özge Hüsniye Namlı addresses data mining approaches to predict customer behaviors in banking sector by using data from Portugal Banks. The study uses c4.5 algorithm, a decision trees algorithm, integrated with

the ensemble machine learning methods to increase the efficiency of the algorithm. In classification of the customers, the study employs Artificial Neural Networks and Support Vector Machines as Traditional Artificial Intelligence Methods, and Bagging-C4.5 and Boosted-C.45 as ensemble-decision tree hybrid methods, and then compares the prediction performance of the methods.

Burak Gülmez and Sinem Kulluk adapt the meta-heuristic social spider algorithm for training artificial neural networks in their paper entitled “Social Spider Algorithm for Training Artificial Neural Networks.” The performance of the algorithm is evaluated with some conventional and meta-heuristic algorithms on classification benchmark problems and a real-world production dataset. The results show that the social spider algorithm is a competitive algorithm for training ANNs.

The research paper “Forecasting Automobile Sales in Turkey with Artificial Neural Networks” by Ayca Kaya, Gizem Kaya and Ferhan Çebi focuses on sales forecasting by using Artificial Neural Network. The authors also use ARIMA and time series decomposition techniques for forecasting. This study reveals significant factors which have an effect on automobile sales by using multiple regression.

Pelin Çelik and Talha Ustasüleyman suggests a decision making methodology to be used in improving e-store design in sake of customer satisfaction in their study titled “Integrated QFD, Fuzzy Linear Regression and ZOGP: An Application of E-Store Design”. The authors provide a systematic decision tool by integrating quality function deployment, fuzzy linear regression, and zero-one goal programming. The usefulness and practicality of the methodology are validated by its application to a real -life case.

Ozlem Yurtsever and Seniye Umit Firat provide an important contribution to the mitigation of the greenhouse gases by their paper “An Evaluation on Carbon Footprint Indicators in Turkey Located Banks and Worldwide Banks”. They extracted some findings and differences on banking sector applications and literature studies. Authors emphasized that the carbon footprint measurement indicators have to be standardized in order to estimate the impacts of the banks in the global climate change precisely, since service sector has begun to be questioned in terms of the need for controlling greenhouse gases.

We believe that this special issue will be a great help for the researchers, academicians, industrial professionals and students dealing with prediction and assessment techniques and the results of various research papers presented in this issue will act as milestones to further high quality theoretical and practical research. We would like to express our appreciation to Prof. John Wang for giving us the opportunity to publish this special issue and to all reviewers for their voluntary and timely work, which significantly helped to improve the quality of the manuscripts.

*Ferhan Çebi*

*Dilay Çelebi*

*Gül T. Temur*

*Guest Editors*

*IJBAN*

*Dr. Ferhan Çebi is a Professor in Istanbul Technical University Faculty of Management, Management Engineering Department. She holds a B.S. in Chemical Engineering from ITU, a M.S. and a Ph.D. in Management Engineering from ITU. She gives the lectures on Operations Research and Operations Management at the undergraduate level and graduate level. Her main research areas are application of Operations Research techniques to the manufacturing and service problems, production planning and control, fuzziness and mathematical modelling, decision analysis, decision support systems, information technology for competitiveness. She is acting scientific committee member and organization committee member for a number of national & international conferences. Ferhan Cebi is member of editorial boards of International Journal of Information Systems in the Service Sector, International Journal of Information & Decision Sciences, and International Journal of Data Sciences. Her works have been published in several international and national conference proceedings and journals such as Computers and Industrial Engineering, Information Sciences, Information Systems Frontiers, Journal of Enterprise Information Management, Logistics Information Management, International Journal of Information and Decision Sciences.*

*Dr. Dilay Çelebi is Associate Professor of Management at Istanbul Technical University. Her bachelor's degree is in Industrial Engineering of Middle East Technical University in 2000, and she completed her PhD studies in Management Engineering of Istanbul Technical University (ITU) in 2008. Her thesis titled "Stochastic Lot Sizing in a Centralized Distribution Network" received 2008 Doctoral Dissertation Award from Council of Supply Chain Management Professionals (CSCMP). She has worked as lecturer in production management, operations research, decision analysis, and logistics planning and management for a number of undergraduate and graduate level courses in various universities in Turkey, Germany, and Netherlands. She also worked as a leading consultant to International Transport Forum at OECD between 2014 and 2015. Her research interests include international logistics, logistics operations, and modelling.*

*Dr. Gül T. Temur graduated from management engineering department of Istanbul Technical University in 2006 and she completed her Doctor of Philosophy at the same department. Gül T. Temur has worked as a Research Assistant between 2006-2013 in the Faculty of Management at Istanbul Technical University (ITU). She has been still working in Bahcesehir University in the Engineering Management department as assoc. professor. Her main research interests are supply chain management, reverse logistics, decision making, and artificial intelligence.*