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Editor's column

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EDITORIAL

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Ashis Kumar Chakraborty[1]

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Operations Research Society of India (ORSI), founded by Prasanta Chandra Mahalanobis with its head quarter at Kolkata and many chapters scattered all over India, requested me to organise the International Conference on "Advancing Frontiers in Operational Research: Towards a Sustainable World" (AFOR 2017) during December 21–23, 2017. This conference was considered to celebrate the Diamond Jubilee of ORSI as well as the 50th Annual Convention. I was a new entrant in the ORSI system which has a legacy of stalwarts in OR as President of the Society. Heritage Institute of Technology, Kolkata came forward with all its resources to help the Society to organise this big event.

The year 2017 was also important since it was 125th birth anniversary year of Prasanta Chandra Mahalanobis. Organising an event like this needed blessings and co-operation from all those who were involved. Initial response was very poor to say the least. However, a lot of effort needed to be put to reach out to as many researchers as possible. Also we had to knock the doors of many sponsors to make the event successful. The event was also important since ORSI introduced a new category of award in the name of Mahalanobis.

Finally, about one hundred seventy papers were accepted for the conference and a lot of dignitaries from India and many other countries like USA, Japan, Italy, China etc. participated in the conference.

Abstract of all the papers presented were published as a 'book of abstract' during the conference itself. ORSI also took a decision to publish a special issue of "OPSEARCH" to commemorate this occasion. I was chosen as the guest editor for this publication.

I am thankful to all researchers who wanted to contribute in this special issue with the title "Optimization Techniques for Decision Making". For most of our decisions we do some optimization or the other. Hence the Title.

I am also grateful to all the reviewers who helped in reviewing several manuscripts that were submitted for this purpose. I am also indebted to the managing editor of OPSEARCH, Professor Manoj Tiwari, who constantly guided me and also Dr. Soumen Dey, one of my collaborators for their help.

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We have finally selected three theoretical articles and four application papers to form the special issue. A brief details of each paper is given below:

In the first theoretical paper titled "On hidden Z-matrix and interior point algorithm", the authors proposed an interior point based algorithm to solve a linear complementarity problem denoted by LCP (q, A), where A is a real square hidden Z-matrix, which is in turn a generalization of Z-matrix and q is a real vector. The authors claimed and showed that the proposed algorithm, under some assumptions, can solve LCP (q, A) in a polynomial time. Two numerical examples are described in support of the results.

The second paper is titled "Portfolio Optimization using Laplacian Biogeography Based Optimization". The authors attempted to solve the well-known portfolio Optimization problem. The authors particularly described two of the recent variants of Biogeography based optimization (BBO) techniques, namely, Laplacian Biogeography based Optimization and Blended Biogeography based Optimization. The authors used Indian Sensex data of 1 year during April 2015 to March 2016. Various properties like sensitivity of the models, their statistical proprieties were compared and the authors showed that the Laplacian BBO model is better compared to the other BBO model. However, when it comes to study the convergence behaviour of the two models, the article could not conclude in favour of one or the other model, because of occurrence of some infeasible solutions.

In the third theoretical paper titled "Generalization of extent analysis method for solving multi-criteria decision making problems involving intuitionistic fuzzy numbers" the authors deal with an interesting and novel topic. The authors aimed at generalizing the extent analysis method (EAM) developed by changing in intuitionistic fuzzy settings for a better modelling of imprecision and uncertainty inherent in nature. The advantage in generalizing the intuitionistic fuzzy settings in the form of Generalized Intuitionistic Fuzzy EAM (GIFEAM), which uses Triangular Intuitionistic Fuzzy Numbers (TIFNs) is to provide decision makers with flexible intuitionistic fuzzy choice. The GIFEAM captures uncertainty more accurately, may be at the cost of more computational complexity. However, the authors provide two examples to validate their proposed method.

In the first application paper titled "A hybrid regression model for water quality prediction", the authors dealt with a real life problem in a paper manufacturing company with regard to improvement of the prediction process of water quality to be used for paper making. The study shows that a hybrid method using first Regression Tree (RT) algorithm to train and built a decision tree model to calculate important features of the process followed by support vector regression with the output of RT as an additional input provides a better accuracy to the predictions of water quality. The authors showed that the proposed hybrid methodology works better compared to other state-of-the art methods used for similar purposes.

In the application paper titled "Optimization of software development life cycle process to minimize the delivered defect density", the authors specially mentioned about some software used by different banks. Their study was aimed at improving the software development process at different stages in order to ensure lower defect density in the software that are released in the market. The authors considered thirteen explanatory variables, mostly of continuous type, and optimized the variables

under certain conditions. They then used the optimal settings to three more banking and financial domain softwares for validation of their proposed method. The results of validation are not so encouraging though.

The third application paper is on "Modeling and Analysis of Healthcare Inventory Management Systems". The authors formulated a standard Health care Optimization problem of a pharmacy in a Kolkata based hospital as an inventory problem and solved it taking care of its dependence on the number of occupancy of different types of beds in the hospital. The primary objective was to minimize the total inventory cost under space and service level constraints and get the optimal reorder level and order-up-to level parameters.

The application paper titled "A comparative study of Performance Measurement of Indian Public Sector Banks using AHP-TOPSIS and AHP-Grey Relational Analysis" is the concluding paper of this special issue. The authors made a very thorough literature survey of the methodologies used in the paper and applied the methodologies to some published data to compare the performance of several Indian public sector banks and conclude that the State Bank of India ranks the best irrespective of the method used. It also demonstrates the use of some multi- criteria decision making tools for performance comparison purpose.

I must thank ORSI to provide me this opportunity.