

## **Special Issue for 12th International Conference of Iranian Operations Research Society**

This is a special issue of the Iranian Journal of Operations Research that includes some of the invited talks presented at the 12th international conference of the Iranian Operations Research Society (IORS), organized jointly by IORS and Mazandaran University of Science and Technology and held at the Mizban Hotel, Babolsar, Mazandaran, Iran, May 1-2, 2019. The IORS conference is held annually and is the main event for presentation of new theoretical and applied developments of OR. International participation is enhanced by some invited talks presented by international scholars. There were over 400 participants, and 276 accepted talks. The selected papers for this special issue were reviewed going through the usual reviewing process and 5 papers were accepted for publication in the special issue.

The first paper by Bijan Mohammadi [1] is concerned with setting up an uncertainty qualification cascade, based on application of data analysis concepts along with the existing deterministic simulation platforms. The results lead to qualification of confidence in optimal solutions of certain problems with no need for intensive large dimensional sampling. Several examples are worked through and possible defects are noted using the quantification scheme.

The second paper by Mahdi Saadat, Iraj Mahdavi, Mohammad-Mahdi Paydar and Sara Firouzian [2] develops a bi-objective model for cellular manufacturing systems, while taking the technology of the machine being used, the priority of parts and operator's level of skill into consideration. The first objective is concerned with minimization of inter-cellular movements of parts and workers, and the second objective is to create efficient cells. Two solution methods are considered: (1) augmented  $\varepsilon$ -constraint algorithm and (2) non-dominated sorting genetic algorithm II (NSGA-II). The obtained results show outperformance of NSGA-II on large-scale problems.

The third paper is by Günter Bärwolff [3], who makes use of the Lagrangian technique to optimize the production process of solid state crystals from mixed crystal melts. An adjoint system of equations is first developed for the crystal melt and then the corresponding KKT system is discretized using a finite volume method.

The fourth paper by Mehrdad Ghaznavi and Mahbobe Abkhizi [4] offers a new algorithm for computing the Pareto front for bi-objective optimization problems. A unified scalarization technique due to Pascoletti-Serafini is used to develop a new algorithm for constructing the Pareto front. Comparative test results illustrate the effectiveness of the proposed method in producing almost equidistant approximation of the Pareto front.

The fifth paper by Firozeh Bastan and Seyyed Mohammad Taghi Kamel MirMostafae [5] is concerned with obtainment of approximations of point Bayes estimate of the parameters of the Poisson-exponential distribution making use of the maximum likelihood method based on complete samples. Three methods are considered and a Monte Carlo simulation is conducted to compare the performance of the proposed methods. Although the obtained results do not show outperformance of one method over the others in all cases, but one method appears to be more robust (shows to be more stable).

## References

- [1] Mohammadi, B. (2019), Forward and backward uncertainty quantification in optimization, *Iranian Journal of Operations Research*, 10(2), 03-19.
- [2] Saadat, M., Mahdavi, I., Paydar, M.M. and Firouzian, S. (2019), A bi-objective model for cellular manufacturing system considering worker skills, part priorities, and equipment levels, *Iranian Journal of Operations Research*, 10(2), 20-41.
- [3] Bärwolff, G. (2019), Optimization of a thermal coupled flow problem of semiconductor melts, *Iranian Journal of Operations Research*, 10(2), 43-51.
- [4] Ghaznavi, M. and Abkhizi, M. (2019), A new algorithm for constructing the Pareto front of bi-objective optimization problems, *Iranian Journal of Operations Research*, 10(2), 52-64.
- [5] Bastan, F. and MirMostafaei, S.M.T.K. (2019), Approximating Bayes estimates by means of the Tierney Kadane, importance sampling and Metropolis-Hastings within Gibbs methods in the Poisson-exponential distribution: A comparative study, *Iranian Journal of Operations Research*, 10(2), 65-84.

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