

# Editorial to the Special Cluster on Variable Neighborhood Search, Variants and Recent Applications

The Variable Neighborhood Search (VNS) metaheuristic is based on systematic changes in the neighborhood structure within a search. It has been successfully applied for solving various combinatorial and global optimization problems, and related tasks. The aim of this special cluster of papers in this issue of *International Transactions in Operational Research* (ITOR) is to gather not only recent algorithmic, theoretical, and methodological developments in the field of Variable Neighborhood Search, but also to publish surveys and recent applications in this area. The VNS papers in this issue are linked to the 3rd International Conference dedicated to Variable Neighborhood Search (VNS'14), which was held in Djerba, Tunisia, October 8–11, 2014. Each submission was peer reviewed by at least two referees, according to the editorial policy of ITOR. After the refereeing process, the following seven papers were finally accepted for publication:

The issue begins with the paper “A variable neighbourhood search algorithm to generate piano fingerings for polyphonic sheet music” by M. Balliauw, D. Herremans, D. Palhazi Cuervo, and K. Sörensen. The authors introduce an efficient VNS algorithm to solve the piano fingering problem in order to deal with complete pieces of complex polyphonic music.

The second paper considers bibliography retrieval and clustering of biomedical literature from Medline/PubMed and it is titled “A quartet method based on variable neighbourhood search for biomedical literature extraction and clustering”. S. Consoli and N. Stilianakis present a novel application of the reduced variable neighbourhood search method that allows the quick retrieval of biomedical-related bibliography, and to detect linked works and detailed relationships within topics of interest.

S. Consoli, J.A. Moreno-Pérez, and N. Mladenović, in the paper “Comparison of metaheuristics for the  $k$ -labelled spanning forest problem”, deal with the  $k$ -labelled spanning forest problem. The authors have developed an intelligent VNS method that makes use of machine learning, statistics, and experimental algorithmics, in order to automate the optimization strategy for this  $\mathcal{NP}$ -hard problem.

The fourth paper studies the optimal routing of vehicles in multi-size containers drayage operations. M. Vidović, D. Popović, B. Ratković, and G. Radivojević in their paper titled “Generalized mixed integer and VNS heuristic approach to solving the multi-size containers drayage problem” show how VNS

heuristics can solve container drayage problems of realistic size that arise in different transportation and logistics systems, in a reasonable computation time.

In the paper by A. Mjirda, R. Todosijević, S. Hanafi, P. Hansen P., and N. Mladenović titled “Sequential variable neighborhood descent variants: An empirical study on travelling salesman problem”, the aim is to experimentally compare different variants of sequential variable neighborhood descent and their influence on the solution qualities when they are used as local searches within general variable neighborhood search.

The sixth paper is titled “Parallel variable neighborhood search for the min-max order batching problem” and authored by B. Menéndez, E. Pardo, J. Sánchez-Oro, and A. Duarte. It tackles the min-max order batching problem that appears in warehouse optimization. The authors propose a parallel VNS algorithm for solving this problem, which is shown to outperform other state-of-the-art approaches by using an extensive experimental comparison.

Finally, this special cluster closes with the contribution from M. Kammoun, H. Derbel, M. Ratli, and B. Jarboui “An integration of mixed VND and VNS: The case of the multi-vehicle covering tour problem”. The authors propose a VNS algorithm for the multi-vehicle covering tour problem, which consists in a generalization of the classic vehicle routing problem that appears in logistics and transportation.

We would like to thank all the authors who contributed to this special cluster in this issue and also gratefully acknowledge the hard work by the referees who provided timely and constructive reports.

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