



## Special issue on 'Recent advances in multi-disciplinary modeling & simulations'

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Modeling can be described as a broad, systematic, and multidisciplinary set of processes that deals with real-life system problems in order to translate the faced problem into a mathematical equation and solve the problem by proposing a tested solution for real-life examples. This mathematical modeling techniques and tools are widely accepted and gained attention from many different perspectives such as academicians, engineers, scientists, and mathematicians, etc. due to their efficiency to solve the problems via presenting a mathematical and logical representation of the related problem and easy applicability to real-world situations and relations. Modeling is a subsidiary discipline that can offer effective solutions to many other methods such as optimization and simulation. A simulation is an evidence-based approach that imitates and animates a model of real-world dynamics. The reason behind using simulation is to straighten out the mechanism dynamics by examining the evidence and trying to predict future behaviors. For this purpose, simulation aims to control the system by revealing the system dynamics by presenting a virtual framework and tries to test the possible scenarios to reach the best outcome for the decision-making process. Therefore, modeling and simulation terms are intertwined concepts that both are used to propose an optimized solution by visualizing the problem.

This special issue on '*Recent Advances in Multi-Disciplinary Modelling & Simulations*' is the compilation of the short listed papers of 4th International Conference on Mathematical Techniques in Engineering Applications (ICMTEA2020) held during December 4–5, 2020 in Graphic Era (Deemed to be University), Dehradun, Uttarakhand, India. The special issue comprises six articles of which two articles are about optimization techniques. For instance, Vohra et al. (2021) provided extensive optimization-

based approaches for better optimization of the hydrocarbon manufacturing techniques in petroleum engineering. Dubey et al. (2021) proposed a second-order non-differentiable multi-objective Schaible type optimization problem over arbitrary cones. Chhibber et al. (2021) focused on the intuitionistic fuzzy transportation problem in order to deal with its unpredictable parameters such as fuel charges, climatic situations, product supply and demand, and so on. In this context, a critically examined review has been presented to solve problems and find solutions to various fuzzy transportation problems. Seth et al. (2021) display a two-stage efficiency model by adopting non-traditional data envelopment analysis (DEA) in order to assess the performance of the airline and smooth coordination of the two internal operational stages. Gupta et al. (2021) studied in their paper to developing the quality of service (QoS) of outdoor prediction models and predicting the accuracy of QoS by using the tuning and multivariate machine learning. Singh et al. (2021) conducted multi-criteria group decision making (MCGDM) by using the integration of ELECTRE1 and VIKOR methods. This hybridized new model has been used in order to overcome the shortcomings in Pythagorean Fuzzy Environment.

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