

Editorial

Editorial Conclusion for the Special Issue “Advanced Transportation Technologies and Symmetries in Intelligent Transportation Systems”

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Citation: Tian, G.; Li, Z.; Yu, D.; Fathollahi-Fard, A.M.; Jin, L.; Jiang, X. Editorial Conclusion for the Special Issue “Advanced Transportation Technologies and Symmetries in Intelligent Transportation Systems”. *Symmetry* **2022**, *14*, 1439. <https://doi.org/10.3390/sym14071439>

Received: 28 June 2022

Accepted: 7 July 2022

Published: 13 July 2022

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The recent advances in the intelligent transportation systems (ITS) are reviewed in this Special Issue in which many techniques in mathematics, artificial intelligence, machine learning, automatic control, and optimization theory were considered to address the ITS based on recent technologies, methods and symmetries. Most importantly, this Special Issue focuses on the recent solution algorithms mainly on exact, heuristics and metaheuristics for solving large-scale ITS-based models.

Regarding the impact of ITS on the today’s economy and recent advances and technologies related to current trends like transportation, healthcare systems, supply chains, internet of things, and circular economy, the guest editors were selective to have a comprehensive review process for each submission based on the journal’s policy and guidelines. In this special issue, we have received 14 submissions and after a comprehensive review process, 6 high-quality works have been accepted for publication (i.e., the acceptance rate was around 0.42).

Among the accepted papers, Zhang et al. [1] considered the travel time, walking distance, parking cruise time, parking fee, and personal attributes of drivers, simultaneously, to develop a stochastic model for making the parking and ride selection decisions with different commuter scenarios. They proposed a symmetric duality algorithm to achieve the goal of occupancy equilibrium. Li et al. [2] proposed the sidewalk’s facilities environment while dividing the urban pedestrian road system into five sub-systems including underpass, overpass, crosswalk, sidewalk, and road crosswalk systems. Their main novelty was a solution as a hybridization of analytical hierarchical process and data envelopment analysis-based heuristic algorithm while solving a case study in Harbin, China.

The urban public transportation system was modeled by Lin et al. [3]; complex network theory and the symmetry of the up and down bus routes and stations are considered in their model. An ant colony metaheuristic algorithm was developed to a case study at Changchun city in China. In another work contributed by Hou et al., [4], the Lyapunov stability theory was adopted to simulate the comfort and handling stability of a vehicle under intelligent traffic conditions.

In another interesting study in this Special Issue, Fathollahi-Fard et al. [5] developed a scenario-based robust optimization model to formulate a sustainable home healthcare system as an ITS considering all economic, environmental, and social factors for making a balance for unemployment time and working time of caregivers. They considered the impact of COVID-19 pandemics on the performance of home healthcare systems. They proposed different heuristic algorithms and an efficient metaheuristic based on the red deer algorithm. Finally, Peng et al. [6] developed a motion planning method for automated vehicles while completing driving tasks in dynamic traffic scenes. Their solution algorithm was a local search metaheuristic, namely, the simulated annealing algorithm to enhance the process of searching for finding the optimal trajectories.

In conclusion, all the guest editors did their best to cover major topics of ITS applications to adequately contribute to the existing literature and fill out some of the critical gaps in the critical work on ITS models and algorithms. It goes without saying that all the guest editors would like to thank the editor-in-chief, Prof. Dr. Sergei D. Odintsov, the editorial team and the reviewers of *Symmetry* who helped us in this long journey.

Author Contributions: Conceptualization, G.T., X.J. and A.M.F.-F.; methodology, G.T., D.Y. and A.M.F.-F.; software, G.T., D.Y. and A.M.F.-F.; validation, A.M.F.-F.; formal analysis, G.T. and L.J.; investigation, A.M.F.-F.; writing—original draft preparation, D.Y.; writing—review and editing, A.M.F.-F. and L.J.; visualization, A.M.F.-F.; supervision, A.M.F.-F. and Z.L.; project administration, X.J. and A.M.F.-F. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

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