information

Editorial

Editorial of the Special Issue "Intelligent Transportation Systems"

Muhammad Alam [1] and Joaquim Ferreira [1,2,*]

[1] Instituto de Telecomunicações, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal; alam@av.it.pt
[2] Escola Superior de Tecnologia e Gestão de Águeda–ESTGA, Universidade de Aveiro, 3810-193 Aveiro, Portugal
* Correspondence: jjcf@ua.pt

Received: 8 November 2017; Accepted: 8 November 2017; Published: 12 November 2017

Transportation systems are very important in modern life; therefore, massive research efforts have been devoted to this field of study in the recent past. Effective vehicular connectivity techniques can significantly enhance efficiency of travel, reduce traffic incidents and improve safety, and alleviate the impact of congestion, constituting the so-called Intelligent Transportation Systems (ITS) experience. ITS includes telematics and all types of communications in vehicles, between vehicles (e.g., V2V), and between vehicles and infrastructure (e.g., V2I). ITS integrates information and communication technologies (ICT), and applies them to the transportation sector. These systems gather data from sensors and equipment deployed within vehicles and infrastructure, and provide services that aim to improve the current transportation systems, making them more efficient, sustainable, safe, and environmentally friendly. The main goals of this Special Issue are to publish high-quality research, both from academic and industrial stakeholders, and serve as an outlet for disseminating innovative solutions, demonstrating the potentials of ITS. We received a total of ten papers, and only six high-quality papers were considered for publication in the journal. Of the six published works, four are research articles, and two are review articles.

The first paper, titled "A Robust Timetabling Model for a Metro Line with Passenger Activity Information", presents work on a robust timetabling model (RTM) for metro lines, taking into account passengers' activity information, including congestion and buffer time adjustments. The main objective pursued by dispatchers in the model is the enhancement of punctuality while minimizing train delays by adjusting the buffer time. By explicitly taking passenger activity information into account, a mixed-integer nonlinear programming (MINLP) model was developed, and a genetic algorithm (GA) was proposed to solve the model. Numerical experiments based on the Batong line of the Beijing Metro were carried out, the results of which verify the effectiveness and efficiency of the proposed method.

The second paper, "Planning of Vehicle Routing with Backup Provisioning Using Wireless Sensor Technologies", presents a comprehensive consideration of vehicle routing with backup provisioning. In this article, the authors have addressed vehicle routing with backup provisioning, where the possibility of reacting to overloading/overcrowding of vehicles at certain stops is considered. This is based on the availability of vehicle load information, which can be captured using wireless sensor technologies. Additionally, the problem is mathematically formalized, and a heuristic algorithm using local search procedures is proposed. The presented results show that planning routes with backup provisioning can allow fast response to overcrowding, while reducing costs. Therefore, sustainable urban mobility, with efficient use of resources, can be provided while increasing the quality of service perceived by users.

The third paper, "A Practical Point Cloud Based Road Curb Detection Method for Autonomous Vehicle", presents work on curb detection. A practical road curb detection method using point cloud from a three-dimensional Lidar for autonomous vehicle is reported in this paper. The authors used a multi-feature, loose-threshold, varied-scope ground segmentation method to increase the robustness

of ground segmentation for detecting obstacles above the ground. Additionally, the road curb was detected by applying the global road trend and an extraction-update mechanism. The performed experiments demonstrated the robustness and efficiency of the road curb detection under various environments. The presented method for road curb detection is 10 times faster than the traditional method, and the accuracy is much higher than existing methods.

The various forms of connectivity for intelligent and cooperative vehicles are expected to produce unforeseen benefits by enhancing the performance of the world-wide transportation system in terms of its safety, mobility, and sustainability. The fourth accepted article, "Deployment and Field Evaluation of In-Vehicle Traffic Signal Advisory System (ITSAS)", in this Special Issue, presents work on the impact of In-vehicle Signal Advisory Systems (ITSAS) on signalized roads. The main objective of ITSAS is to provide individual drivers equipped with a mobile communication device with advisory speed information enabling the minimization of time delays and fuel consumption when crossing intersections. One of the novel aspects of this work is that, unlike other similar Connected Vehicles applications for intersection management, the presented system does not require Roadside Equipment (RSE) to disseminate the advisory speed information, as it is designed to exploit commercial cellular network services. Additionally, the authors have provided the field evaluations of ITSAS on a signalized corridor in New Jersey, demonstrating significant travel time savings for the equipped vehicle. The presented results validate the proposed system.

The fifth paper, titled "Car-to-Pedestrian Communication Safety System Based on the Vehicular Ad-Hoc Network Environment: A Systematic Review", presents a comprehensive overview of car-to-pedestrian communication and covers mainly the safety aspects. The main idea and goal of this review was to systematically evaluate and access the reliability of car-to-pedestrian communication safety system based on the vehicular ad-hoc network environment and provide some recommendations for the future works based on the existing literature. In addition, a quality evaluation was developed through established items and instruments tailored to this review.

The last paper of this Special Issue is focused on the traffic control signals and its contribution to the urban traffic congestion control. The paper is titled "An Adaptive Traffic Signal Control in a Connected Vehicle Environment: A Systematic Review", and the authors present work on the contribution of adaptive traffic signal controls, and show a powerful ability to effectively alleviate urban traffic congestion to achieve desirable objectives, such as low delays. In this work, quality evaluation was carried out based on previous research instruments, and applied to the current review. The authors critically review the existing methods of adaptive traffic signal control in a connected vehicle environment, and compare the advantages and disadvantages of those methods.