Guest Editorial Preface

Special Issue on Smart Driver Assistance Systems and Autonomous Driving

Larbi Guezouli, LaSTIC Laboratory, Department of Computer Science, University of Batna 2, Batna, Algeria

The National Highway Traffic Safety Association was created in 1970. Its main role was to effect safety standards on vehicles. Since its creation, manufacturers have been competing to seriously think about creating systems that will help drivers drive safely and without accidents. The role that driver assistance systems can play in reducing road accidents and make driving safer cannot be overstated.

Today, the obligation to use data-mining in driver assistance systems seems to be a reality. The use of data mining affects many areas of research, where a huge amount of information needs to be manipulated.

During the last decade, several research studies on this issue have been launched to find optimal solutions and many approaches have been proposed.

To help the driver in his driving task, we will deal with real-time information processing in order to facilitate the prediction of the dangers related to the different driving parameters. For this, several questions will be asked:

- How can we manage the vast amount of information captured by different devices placed on the car?
- How do we filter pertinent information from captured information?

This special issue on: "*Smart Driver Assistance Systems and Autonomous Driving*" of the *International Journal of Software Science and Computational Intelligence* (IJSSCI) focuses on information processing in driver assistance systems. It contains five original and well-reviewed papers.

The topics covered in this special issue include: Driver assistance systems; scene understanding; software architectures for autonomous vehicles; driver-vehicle interaction and assisted driving; computational intelligence; image processing; information retrieval; knowledge representation; machine learning; neural computing; signal processing; information and communication technologies for development.

In the first paper entitled "*The Optimal Path Finding Algorithm Based on Reinforcement Learning*", *Ganesh Khekare, Pushpneel Verma, Urvashi Dhanre, Seema Raut and Shahrukh Sheikh* propose an algorithm which takes into consideration multiple objectives and provides an optimal route solution. It is based on reinforcement learning and capable of deciding the optimal route on its own.

Meriem Benadda and *Ghalem Belalem* propose the service "HAaaS" in "*Improving Road Safety for the Drivers Taken Malaise and Sleepiness Behind the Wheel Using Vehicular Cloud Computing and Body Area Networks*". In their paper, they present a new Vehicular Cloud Computing service, named "HAaaS", based on BANs to detect, monitor and manage driver's malaise and provides a cooperation support for the driver rescue. The aim is to reduce the number of accidents, material and human damage as well as the time and fuel lost in traffic jams.

Rinat Galiautdinov considers the possibility of applying modern IT technologies to implement information processing algorithms in UAV motion control system in his paper "*Information processing systems in UAV based on Bayesian filtering in conditions of uncertainty*". Filtration of coordinates and motion parameters of objects under a priori uncertainty is carried out using nonlinear adaptive filters: Kalman and Bayesian filters. The author considers numerical methods for digital implementation of nonlinear filters based on the convolution of functions, the possibilities of neural networks and fuzzy logic for solving the problems of tracking UAV objects.

In his paper "*Experience-based approach for cognitive vehicle research*", *Hironori Hiraishi* discusses an experience-based approach to cognitive vehicle research. He analyzed the driving data he collected, and he developed models using the Cognitive Qualitative Analysis and Modeling tool (QCAM) that he has developed.

The last paper is presented by *Houcine Matallah, Ghalem Belalem* and *Karim Bouamrane* and entitled "*Evaluation of NoSQL Databases - MongoDB, Cassandra, HBase, Redis, Couchbase, OrientDB*". In this paper, authors develop a comparative study about the performance of six solutions NoSQL, very employed by the important companies in the IT sector: MongoDB, Cassandra, HBase, Redis, Couchbase and OrientDB. They provide some answers to choose the appropriate NoSQL system for the type of data used and the type of processing performed on that data.

We would like to thank all the authors for having submitted their research results for publication in this special issue. We toughly believe that the papers published here reveal progress in the topic of smart driver assistance systems and autonomous driving. Also, we are very grateful to the collaboration of the reviewers which influence on the final quality by their expertise. We sincerely thank Prof. Brij Gupta and Prof. Andrew Wai Hung Ip, Editors-in-Chief of International Journal of Software Science and Computational Intelligence (IJSSCI), for giving us the opportunity to prepare this special issue and their advice throughout this project. The support of the publisher with technical issues was also very welcomed and assured good progress.

We hope that reading these high-quality papers will inspire you to make your own submissions to future issues.

Larbi Guezouli
Guest Editor
IJSSCI