

Special Issue on  
**Advanced Visual Analyses for Smart and Autonomous Vehicles**

# CALL FOR PAPERS

Thanks to the major advances of sensing, communication, and computing, smart and automated vehicle (SAV) technologies have been the strong driving force behind the rapid development of intelligent transportation system (ITS). Advanced visual analyses techniques based on camera/radar/lidar/IR sensing spanning the fields of computer vision, image/video analyses, machine learning, and so forth have become the indispensable tools for SAV technologies, especially for enhancing safe and autonomous operation of vehicles in traffic, mainly based on three main components (i.e., environment, vehicle, and driver (EVD)) of the overall driving context.

More specifically, advanced visual analyses can infer the dynamic environment scenes outside the vehicles, such as roadway situations and weather conditions, pedestrians, and other vehicles moving trajectories, as well as traffic lights/signs. Advanced visual analyses can also improve the detection accuracies of vehicles' driving states, such as the vibration, speed, acceleration, and abrupt turns. Moreover, advanced visual analyses can serve as nonintrusive monitoring of the drivers which needs to be safely maneuvered in the environment. The complex dynamics of various events and interaction of various "EVD" system components affect the overall safety and comfort of driving, as well as the condition of the traffic flow. Real-time awareness and dynamic response of these system components can proactively result in better driving safety systems and driving experiences, which can accurately, reliably, and very quickly identify the conditions that would lead to an accident and to force corrective actions so that the accident can be prevented.

The goal of this special issue is to share new advanced visual analysis techniques, bring forward challenges, and present comprehensive reviews for SAVs. More specifically, this special issue focuses on state-of-the-art researches of integrating advanced visual analysis techniques, which can be effectively applied to vehicle and driver sensing, road and pedestrian monitoring, data fusion analysis, correction and response, and so forth.

Potential topics include but are not limited to the following:

- ▶ Object detection, object tracking, and 3D environment inference of SAVs
- ▶ In-depth exploitation of deep learning and transfer learning of SAV sensing data
- ▶ Visual SLAM (simultaneous localization and mapping) for SAVs
- ▶ Effective data fusion of visual data from SAVs
- ▶ Saliency and anomaly detection for safety/autonomous driving
- ▶ Visual analyses for drivers' action detection and behavior understanding
- ▶ Visual analyses for vehicles' dynamic state estimation and prediction
- ▶ Use of mobile edge computing for visual analyses of SAVs
- ▶ Support of V2X for visual information exchange among vehicles
- ▶ System integration of visual analyses for safety/autonomous driving
- ▶ Human centric HCI designs and architectures for SAVs

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/am/svu/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

**Lead Guest Editor**

Zhijun Fang, Shanghai University of Engineering Science, Shanghai, China  
*zjfang@sues.edu.cn*

**Guest Editors**

Jenq-Neng Hwang, University of Washington, Seattle, USA  
*hwang@uw.edu*

Shih-Chia Huang, National Taipei University of Technology, Taipei, Taiwan  
*shuang@ntut.edu.tw*

**Submission Deadline**

Friday, 1 June 2018

**Publication Date**

October 2018