

Special Issue on Signal Processing for Smart Vehicle Technologies

The invention of the automobile transformed how people live, work, and interact in society. Today, with an ever increasing number of in-vehicle options/activities, as well as the increasing demands being placed on the driver, vehicle platform, and transportation infrastructure, more is being asked of engineers, designers, scientists, and transportation specialists.

Signal processing is playing an increasingly substantial role in this domain, including such general topics as monitoring driver distraction, vehicle lane/control detection/tracking, driver assistance through autonomous platforms, and vehicle infrastructure support and planning/monitoring. The diversity of these problems requires a more collaborative effort from engineers and scientists from a diverse set of specialties. The impact to society is massive, including such broad aspects as (i) safety, (ii) commerce {i.e., sales and support/maintenance of vehicles}, (iii) energy costs {i.e., fossil fuel consumption, etc.}, and (iv) population mobility for effective traffic management. How will signal processing advance today's vehicles into "smart" cars that are able to think and contribute to the task of operating a vehicle? What safety concerns are there in moving from a 100% driver-controlled vehicle, to driver assistive technologies (e.g., cruise control, assistive braking, lane departure monitoring, etc.), to full autonomous driving? Many new and emerging challenges arise and need to be addressed in collaborative ways.

The goal of this special issue is to open the door for discussion and review the current state of the art in signal processing for smart vehicle technology, as well as potentially bridging a number of sub-fields including experts in cognitive psychology who deal with how and why we drive the way we do, to control system experts that employ signal processing to deal with vehicle dynamics and connecting the vehicle's controls to better support the driver's capabilities. This special issue provides a venue for summarizing, educating and sharing the state of the art in signal processing applied to the domain of automotive systems.

Topics of Interest include (but are not limited to):

- DSP technologies in adaptive automobiles, diagnosis and maintenance
- Speech, hands-free, and in-car communication algorithms and evaluation
- In-vehicle dialogue systems and human-machine interfaces
- Driver-status monitoring and distraction/stress detection
- Computer vision methods for vehicle recognition and assisted driving
- Multi-sensor fusion for driver identification and robust driver monitoring
- Video & audio processing analytics associated with the vehicle platform
- Signal processing for position and velocity estimation and control
- Signal processing for green vehicle related energy management
- Vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications & networking
- Autonomous, semi-autonomous and networked vehicular control
- Human factors and cognitive science in enhancing vehicle and driver safety
- Machine learning and data analytics associated with automotive systems
- Issues regarding security and privacy aspects for smart vehicle systems

Important Dates	
White paper due	October 31, 2015
Invitation notification	December 1, 2015
Manuscript submission due	January 31, 2016
1 st Round Review	March 31, 2016
Revised manuscript due	May 15, 2016
Final acceptance notification	July 20, 2016
Final material from authors	August 5, 2016
Special Issue Publication	November 2016

White papers are required, and full articles are invited based on the review of white papers. The white paper format is up to 4 pages in length, including proposed article title, motivation and significance of the topic, an outline of the proposed paper, and representative references; the author list, contact information and short bios should also be included. **Articles submitted to this issue must be of tutorial and overview/survey nature and in an accessible style to a broad audience, and contain significant relevance to the scope of the special issue.** Submissions will be reviewed according to the IEEE Signal Processing Magazine guidelines, and should not have been published or under review elsewhere. Submissions should be made online at <http://mc.manuscriptcentral.com/sps-ieee>. For guidelines and information on paper submissions, visit <http://www.signalprocessingsociety.org/publications/periodicals/spm/>.

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