

CFP: Applications and Systems for Collaborative Driving

Previous advancements in sensing and computing technologies in automotive have led to the development of highly effective driver assistance systems, improving vehicle control, safety, traffic efficiency and reducing environmental impact.

Benefits are further magnified by exploiting communication among vehicles and with the road infrastructure. Vehicles are becoming sensors able to share various and detailed information, significantly widening the awareness horizon of each single car. Add to that the active participation of drivers to elevate simple cooperative driving to true collaborative driving.

Availability of such a dynamically distributed system also represents a valuable reduction in costs with respect to stand-alone systems. Furthermore, collaborative systems represent a significant step towards autonomous driving, especially in areas with high traffic densities.

A wide range of new services and applications are being enabled by vehicular cooperation, supporting better safety and navigation, driver behavior improvement and coaching, traffic efficiency, emission reduction. A true collaborative approach adds significance to the driver's and travelers' role, thus substantially increasing the potential and variety of the offered services – with safety and security-related issues as well.

Several initiatives have been carried out in the recent years, also on large scale, and this special issue intends to offer a reference point for showcasing the leading-edge research work in the field.

We solicit papers describing applications, systems, platforms, and techniques for collaborative driving. The topics of interest include, but are not limited to:

- Applications based on inter-vehicle, inter-driver and vehicle-infrastructure collaboration (e.g., collaborative navigation, collaborative parking, traffic management, collaborative/cooperative collision warning and avoidance, overtaking assistance, Collaborative/Cooperative Adaptive Cruise Control, lane merging and splitting, multi-lane platooning, etc.)
- Safety and security issues in collaborative driving
- Big data and data processing technologies for collaborative driving
- Algorithms for collaborative driving, e.g., sensor fusion, robust and safe control
- Hardware and systems for collaborative driving
- Collaborative mapping and localization systems
- ITS community building and social gaming
- Communications systems and protocols for collaborative driving
- Human-Computer interaction/interface for collaborative driving systems
- Impact of collaborative driving, e.g., on traffic, energy, environment, and society
- Autonomous technologies for collaborative driving
- Business and economic model for collaborative driving
- User studies on collaborative driving

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