Call for Papers
Special Issue of *Presence: Teleoperators and Virtual Environments*

Virtual and Augmented Reality for Autonomous Driving and Intelligent Vehicles

Submission Deadline: October 15, 2017

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Scope of the Special Issue

It is forecasted that augmented reality (AR) and virtual reality (VR) automotive applications will increase road safety, bring intuitive activities to driving, and finally enhance driving experience. AR/VR technology may also help on the transition towards automated driving. AR head-up-displays (HUDs) may soon overlay 3D navigation instructions onto road geometry and moving obstacles like vulnerable road users (pedestrians, bikers, wheel-chair users) and other vehicles may be highlighted to calm down the driver-passenger and enhance trust in their vehicle’s automated operation as the vehicle proves its awareness of its surroundings. VR windshields may allow for dynamic reconfiguration of multi-lane roads based on demand and will, in the long term, remove road signs, traffic lights, road paintings, etc. from the streets.

However, many technological challenges need to be addressed before AR/VR applications will hit the mainstream market. These include how to capture and interpret road geometry through computing intensive sensor fusion, precise vehicle positioning, compensation for vibrations, delays, and jitter, laser projection, driver monitoring via inward facing cameras and designing sophisticated algorithms to generate precise augmentation content in the viewing field of the driver, etc.
Topics of Interest
The central objective of this special issue is to provoke an active debate on potential and constraints, impact, role, and adequacy of using augmented and virtual reality technology in driving applications. We welcome papers that treat with automotive-themed topics addressing challenges such as how to improve driver-vehicle interaction or driving experience or what are technical difficulties and unresolved problems limiting a broader deployment in the near future.

Topics of interest for this special issue include, but are not limited to:
- **Responsive, adaptive and evolvable behaviors in immersive virtual environments** that deal with driver-vehicle interaction in the interior or vehicle-pedestrian interaction in the exterior.
- **Multiuser virtual environments.**
- **Mixed reality** and the experience of real and virtual environments.
- **Tools, techniques, frameworks and methodologies.**
- **Case studies of application** of augmented or virtual reality in the automotive domain.
- **Education** in in the automotive field, e.g., driver training, using AR/VR technology.
- **Evaluation and validation methodologies** for the impact of AR/VR in driving.
- Applications/solutions that deal with **cognitive overload, distraction, inattentional blindness, simulation sickness.**
- Studies reporting the **benefit of AR/VR technology towards attention (span),** etc.
- **Risk assessment** of the use of AR/VR technology for driving and strategies to reduce its risk.
- **Social capabilities** of virtual/augmented reality technology in automotive environments.
- **In- and inter-vehicle gaming applications.**

Submissions
Papers will be selected based on scientific rigor, originality, novelty, and presentation quality. By submitting a paper to this special issue, the authors guarantee that their paper is not currently submitted or accepted for publication elsewhere. Manuscripts should conform to the **recently updated** journal submission guidelines available at [http://www.mitpressjournals.org/journals/pres/sub](http://www.mitpressjournals.org/journals/pres/sub)

Please note that audio and video files can be hosted as supplementary online material accompanying published articles. For more information about multimedia file formats and submission guidelines, please contact <presence@mit.edu> or one of the guest editors.

Schedule
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- Final revisions: April 15, 2018
- Planned publication: **PRESENCE 27-3** (late 2018)

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