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Man Machine Interaction in Autonomous Vehicles

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Abstract: *Today, and possibly for a long time in the near future, the complete driving task is too complex an activity to be fully formalized as a sensing-acting robotics system that can be explicitly solved using model-based and learning-based approaches in order to achieve fully unconstrained vehicle autonomy. This is especially true for unconstrained, real-time operations where the permissible range of error is extremely small and the number of limiting cases is extremely large. Until these problems are solved, human beings will remain an inevitable part of the driving task, monitoring the AI system as it performs anywhere from 0 to just under 100 percent of the driving. Overtaking and lane-changing is a critical part of vehicle automation. Though automation in automobiles has increased security and decreased environmental issues, it causes driver to be less active generating passive fatigue. This passive fatigue can lead to failure in responding quickly if needed. This led automation to keep driver active even though he/she is not required to take up full control all the time. This paper presents the need for alerting the driver during overtaking and lane-changing to avoid accidents and disastrous outcomes. The model uses image processing for lane detection and identification of obstacles, vehicles, and lane tracking. It calculates the relative velocity during overtaking and the system will share the scenarios with the driver, using alert systems. We demonstrate the capabilities and features of our system through real-world experiments using four vehicle's videos processed on the road.*

Keywords: Driving Assistance, Computer Vision, Object Detection, Object, Object Recognition, Object Identification, Image Segmentation, Video Segmentation, Computer Vision Representations, Image Representations, Graphics Input Device, Displays and Imager.

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