World Academy of Science, Engineering and Technology
International Journal of Mechanical and Mechatronics Engineering
Vol:12, No:07, 2018

Smart Side View Mirror Camera for Real Time System

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Abstract : In the last decade, automotive companies have invested a lot in terms of innovation about many aspects regarding the automatic driver assistance systems. One innovation regards the usage of a smart camera placed on the car’s side mirror for monitoring the back and lateral road situation. A common road scenario is the overtaking of the preceding car and, in this case, a brief distraction or a loss of concentration can lead the driver to undertake this action, even if there is an already overtaking vehicle, leading to serious accidents. A valid support for a secure drive can be a smart camera system, which is able to automatically analyze the road scenario and consequentially to warn the driver when another vehicle is overtaking. This paper describes a method for monitoring the side view of a vehicle by using camera optical flow motion vectors. The proposed solution detects the presence of incoming vehicles, assesses their distance from the host car, and warns the driver through different levels of alert according to the estimated distance. Due to the low complexity and computational cost, the proposed system ensures real time performances.

Keywords : camera calibration, ego-motion, Kalman filters, object tracking, real time systems
Conference Title : ICIVA 2018 : International Conference on Intelligent Vehicles and Applications
Conference Location : Prague, Czechia
Conference Dates : July 09-10, 2018