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Title
The Development Of A Driver Assist System With Distance Estimation Using A Single Camera

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In this thesis, an investigation on lane and vehicle tracking on a highway is carried out. The highway is chosen as the test ground due to the one-way flow of traffic, relative straightness of the road and consists of mostly automobiles. This study describes the development of a mid-line generation technique on the road as guidance for drivers to stay in the centre of the road lane they are currently driving on. The technique detects and tracks road lane in a video sequence and draws a virtual mid-line on the screen to guide the driver to stay centred within the lane. As a safety measure, the system will notify the driver with a warning signal if the vehicle zigzags across the lane. If the driver crosses onto another lane, the system will automatically update the new detection on left and right boundaries of the new lane and calculate the mid-line. Furthermore, the system will classify the vehicle into their proper group in order to estimate the distance between the target vehicle and the preceding vehicle. The system works thoroughly when the edges of the preceding vehicle are detected. The detected edges will create a bounding box. The box will be recognised by the back-propagation artificial neural network to classify it into heavy or light vehicle group. Based on the size of the bounding box, the system will then estimate the distance within the target vehicle and the preceding vehicle. To that effect, the objective of this study is to develop a low cost competitive safety system on the road. In order to achieve this, a basic video camera without thermal or infrared function is used to complete the task in this system.