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Robust , Fast and Accurate Lane Departure Warning System using Deep Learning and Mobilenets (Conference Paper)

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Abstract

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Every year, millions of people die from fatalities on the road. This paper develops a lane departure warning system that will alert the driver when the driver may be veering off the road. Recent advances in Deep learning and Artificial Intelligence have shown that Convolutional Neural Networks can be excellent at extracting and identifying features in an image. However, Convolutional Neural Networks are often run on Expensive GPU's with colossal memory and typically run millions of operations in a second. This is a challenging problem for embedded characterized by limited memory or processing power and a real-time capability. In this paper, a lightweight, robust and low memory architecture is explored to enable its incorporation as an embedded system . The proposed final architecture utilizes a novel semantic regression technique that integrates the accuracy of semantic segregation and the speed of regression. An end-to-end Deep learning system is used which takes images as an inputs and outputs the found lane in one shot. The developed system achieves 91.83% accuracy on Malaysian roads. © 2019 IEEE.

SciVal Topic Prominence

Topic: Vehicles | Roads and streets | Road region

Prominence percentile: 98.083

Author keywords

advanced driver assistance system | deep learning | lane detection

Indexed keywords

Engineering controlled terms: Advanced driver assistance systems | Automobile drivers | Convolution | Memory architecture | Network architecture | Neural networks | Roads and streets | Semantics

Engineering uncontrolled terms: Convolutional neural network | End to end | Lane detection | Lane - departure - warning systems | Limited memory | Processing power | Real time capability | Regression techniques

Engineering main heading: Deep learning

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