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Autonomous Vehicle Lane Detection System for Limited Visibility Conditions

IP Status: Pending US Patent; **Application #:** 16/124,502

Feature-based and pixel-based alignments estimate lane marker location

SafeDrive is a robust lane tracking system for assisted and self-driving cars that uses a novel algorithm along with historical imagery to find road makers. The system improves visual lane detection in drastically degraded visual conditions without relying on additional active sensors. SafeDrive uses vehicle location information to locate alternate imagery of the location, applies a combination of feature-based and pixel-based alignment to estimate the location of the lane marker and maps the lane detection information back onto the original image.

Improves safety for manually operated and autonomous vehicles

Autonomous detection of lane markers improves road safety, but most commercial systems require expensive sensors (radar, LIDAR, cameras) to provide lane tracking. Visual approaches are often ineffective due to occlusion, poor weather conditions and paint wear-off. The SafeDrive approach relies on a camera and sensors that can be found in any consumer-grade smartphone device. With a combination of visual lane-finding algorithms, pose detection and robust methods to relate a past image with the live frame, this algorithm can significantly improve driver safety in degraded visual conditions.

Phase of Development

- Proof of Concept. Prototyped in Android application using Google Street Maps.

Benefits

- Increases driving safety in degraded visibility conditions
- Enhances autonomous and assisted vehicles

Features

- Feature-based and pixel-based alignments provide an estimated location of lane markers
- Uses vehicle location information to locate alternate imagery of the location
- Maps lane detection information back onto original camera image
- Displayed in either a heads-up display or on the car console
- Add-on to existing lane tracking systems

Applications

- Autonomous vehicles
- Self driving cars
- Assisted driving cars
- Off road and service vehicles (e.g., snow plows, snowmobiles, etc.)

Technology ID
20170301

Category
Engineering & Physical Sciences/Robotics
Engineering & Physical Sciences/Transportation
Software & IT/Algorithms
Software & IT/Image & Signal Processing
Software & IT/Transportation

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Publications

SafeDrive: Enhancing Lane Appearance for Autonomous and Assisted Driving Under Limited Visibility

arXiv, arXiv:1807.11575 [cs.CV]

Interested in Licensing?

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