PROPOSED TITLE:

LaneLineNet: Advanced Road Lane Line Detection System for Automated Vehicles

Field of Invention:

This invention addresses the need for enhanced accuracy in road lane line detection for automated vehicles through the utilization of deep learning techniques.

Background:

Automated vehicles heavily rely on precise lane line detection to navigate safely. However, existing methods often lack the accuracy required for real-world scenarios, leading to potential safety hazards. LaneLineNet aims to improve this accuracy by leveraging deep learning algorithms.

Objectives:

- Enhancing the accuracy of road lane line detection for automated vehicles.

- Facilitating safer navigation for automated vehicles through precise lane line identification.

- Reducing the risk of accidents and improving overall road safety.

Flow Chart/Model:

[Insert Flow Chart or Model depicting the LaneLineNet architecture and workflow]

FLOW DIAGRAM OF ROAD LANE LINE DETECTION PROJECT

Claims:

1. LaneLineNet incorporates advanced deep learning algorithms to accurately detect road lane lines in various environmental conditions.

2. The system utilizes convolutional neural networks (CNNs) to analyze road images and identify lane lines with high precision.

3. LaneLineNet integrates real-time processing capabilities, enabling continuous and seamless lane line detection during vehicle operation.

4. The invention employs data augmentation techniques to improve model robustness and performance in diverse road scenarios.

5. LaneLineNet adapts dynamically to changing road conditions, ensuring reliable lane line detection in challenging environments.

Technology Used:

- **Software:**

  - TensorFlow

  - Python

  - OpenCV

  - CUDA

  - Keras

- **Hardware:**

  - GPU (Graphics Processing Unit)

  - CPU (Central Processing Unit)

  - Cameras/sensors (for image acquisition)

Proposed Methodology:

1. Data Collection: Gather diverse datasets containing road images with annotated lane lines.

2. Preprocessing: Clean and augment data to enhance model generalization.

3. Model Development: Design and train LaneLineNet architecture using deep learning frameworks.

4. Validation: Evaluate model performance on test datasets and fine-tune as necessary.

5. Deployment: Implement LaneLineNet into automated vehicles for real-world testing and validation.

Abstract:

LaneLineNet is an innovative system designed to revolutionize road lane line detection for automated vehicles. By harnessing the power of deep learning, LaneLineNet achieves unprecedented accuracy in identifying lane lines under various conditions. This advanced technology promises to enhance the safety and reliability of automated driving systems, paving the way for widespread adoption of autonomous vehicles.

End Users:

- Automotive manufacturers

- Autonomous vehicle developers

- Transportation agencies

Advantages:

- Improved accuracy and reliability in road lane line detection.

- Enhanced safety for automated vehicles and passengers.

- Increased efficiency in autonomous navigation and traffic management.

Conclusion:

LaneLineNet represents a significant advancement in the field of road lane line detection for automated vehicles. By leveraging cutting-edge deep learning techniques, LaneLineNet offers unparalleled accuracy and reliability, ultimately contributing to the advancement of autonomous driving technology and safer road transportation systems.