



Lane Detection with Curvature Measurement

Overview

The "Lane Detection with Curvature Measurement" script utilizes computer vision techniques to detect lanes in a video stream and calculates the curvature of the detected lanes. This script is particularly useful for applications such as autonomous vehicles and advanced driver assistance systems.

Goals

Lane Detection: Automatically identify and highlight left and right lane lines in a video stream.

Curvature Measurement: Calculate the curvature of the detected lanes to provide valuable information about the road geometry.

Real-time Processing: Achieve real-time processing of video frames for dynamic lane detection.

Features

Lane Detection: Utilizes Canny edge detection and Hough Line Transform to identify lane lines in a video stream.

Curvature Measurement: Applies polynomial fitting to the detected lane points and calculates curvature for both left and right lanes.

Real-time Display: Displays the original video frame along with the detected lanes and curvature information.

User Interaction: Pressing the 'ESC' key allows users to exit the application.

Usage

Video Input:

The script can read a video file specified by the file path (e.g., "source_video.mp4") or use a webcam by setting the video source as 0.

Run the Script:

Execute the script, and the video window will display the original frame with highlighted lane lines and curvature information.

Exit the Application:

Press the 'ESC' key to exit the application.

Code Overview

Region of Interest: Defines a region of interest to focus on specific areas of the frame for lane detection.

Lane Detection: Uses Canny edge detection and Hough Line Transform to identify and draw left and right lane lines.

Curvature Measurement: Applies polynomial fitting to lane points and calculates curvature for both lanes.

Real-time Processing: Continuously reads video frames, performs lane detection, curvature measurement, and displays the processed frames.

Dependencies

OpenCV: Utilized for image processing, video capture, and drawing functions.