Raspberry-pi Dashcam

Introduction: A dashcam continuously records the view through a vehicle's windshield, providing video evidence for accidents, insurance claims, or capturing scenic drives. It stores video footage in segments, typically 30 seconds each, for easy retrieval and management. The Raspberry Pi is a low-cost, credit-card-sized computer that plugs into a computer monitor or TV and uses a standard keyboard and mouse.

Components: Raspberry Pi 4, Raspberry Pi Camera Module, MicroSD Card, Power Supply (5V, 3A), USB Power Cable.

Software: Raspberry Pi OS, Python.

System architecture:

- The dashcam is powered by the vehicle's power system through a USB power cable connected to the Raspberry Pi 4.
- The Raspberry Pi Camera Module captures video at a predefined frame rate and resolution.
- Captured video files are stored on a MicroSD card.
- Videos are stored in continuous segments (30 seconds each), overwriting the oldest files when the storage is full.

Implementation: To set up the Raspberry Pi dashcam, start by downloading the Raspberry Pi OS (Bullseye) from the official website and using the Raspberry Pi Imager to flash it onto a MicroSD card. Insert the card into the Raspberry Pi, connect a monitor, keyboard, and mouse, and complete the initial setup.
Connect the Raspberry Pi Camera Module by locating the camera port (CSI) on the Raspberry Pi board, gently lifting the plastic latch, inserting the camera module’s ribbon cable with the metal connectors facing away from the HDMI port, and securing the latch. Enable the camera through the ‘raspi-config’ tool, reboot, and test the camera.
Install Python and create a Python script that captures 30-second video segments using OpenCV and stores them in a designated directory. Include a function in the script to delete the oldest files when storage exceeds a set limit. This ensures efficient storage management, preventing the system from running out of space while maintaining continuous recording.