Automatic Rain Sensing Car Wiper

Project Description

This project uses an Arduino, a Rain Sensor, and a Servo Motor to create an automatic wiper system for vehicles. When the rain sensor detects water droplets, the Arduino triggers the servo motor to activate the wiper mechanism automatically. This system simulates how modern cars respond to rain without manual control, enhancing driver safety and convenience.

Components Used

- Arduino Uno - Main controller
- Rain Sensor Module - Detects water droplets on its surface
- SG90 Servo Motor - Simulates the wiper blade movement
- Jumper Wires - For electrical connections
- Breadboard - Optional, for easier prototyping
- External Power Supply - To power the servo motor reliably

Working Principle

- The rain sensor continuously monitors for moisture or raindrops.
- When rain is detected, the sensor sends a digital signal to the Arduino.
- The Arduino processes this signal and commands the servo motor to sweep back and forth, mimicking a real windshield wiper.
- Once the sensor no longer detects water (i.e., the rain stops), the Arduino stops the servo movement.
- This system runs autonomously without any manual control, just like the automatic wipers in modern cars.

Key Features

- Fully automated wiper activation based on rain detection
- Real-time response to changing weather conditions
- Simple and cost-effective prototype simulating real-world automotive technology
- Can be enhanced further with:
    - Variable speed wiper control
    - Rain intensity-based logic
    - Integration with water pump for cleaning simulation

Power Supply Notes

- Arduino can be powered via USB or external 9V battery.
- Servo motors require higher current; use a separate 5V regulated power supply (e.g., 7805 circuit or 2-cell Li-ion battery).
- Ensure common ground between Arduino and servo power supply.