Rain Sensing Automatic Car Wiper Using STM32 Microcontroller

1. ABSTRACT

The turn of the century has seen a tremendous rise in technological advances in the field of automobiles. With 5G technology on its way and the development in the IoT sector, cars will start interacting with each other using V2V communications and become much more autonomous. In this project, an effort is made to move in the same direction by proposing a model for an automatic car wiper system that operates on sensing rain and snow on the windshield of a car. We develop a prototype for our idea by integrating a servo motor and raindrop sensor with an STM32 Microcontroller.

2. INTRODUCTION

Over the past two decades, the automotive industry has aggressively researched ways to exploit modern computing and electronic advances in the development of safety, reliability, and entertainment technologies. Despite this, automatic rain-sensing wiper systems are relatively uncommon in modern vehicles for a number of reasons. They are often too expensive, too unsightly, or too unreliable to be desired in new automobiles. Many attempts have been made at constructing an effective, reliable, and cheap rain detection and wiper control system for vehicles speed and intermittent interval automatically according to the amount of rain. To measure the amount of water usually use optical sensor. In this type of sensors uses the fact that the refraction angle and the amount of reflection of the light are different when the 2 windshield is wet. Even though optical sensors are used widely they have some disadvantage. One of disadvantages is the sensitivity to external light. Another problem is occurs when car drive at night or gone through tunnel and even in underground parking. For this many systems still activate the wiper when the car comes out of tunnels or underground parking lot. Another shortfall, maybe a major one is that the sensing area is a relatively small portion of windshield. Hence the system operate only with limited area.[2] The wiper system may fail to activate when there are some raindrops on the driver's line of sight, but not on the sensing area. They are often too expensive, too unsightly, or too unreliable to be desired in new automobiles.