

WIPER CONTROL SYSTE

(Module 3 ARM Based Microcontroller)

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ABSTRACT

Windshield wipers play a key role during adverse weather conditions by wiping the rain continuously over the windshield area and provides a clear vision to the driver. Wipers are designed and made to clear the water from a windscreen.. It is very important to improve the safety facility in an automobile vehicles .The system used to activate the wiper operation manually.Due to this, many researchers have contributed to research and development on smart wind shield wiper mechanism in automotive. Considering that, the current work compiles a compilation of articles reviewed on smart wind shield wipermechanism from year 1903 to 2015. The windshield wiper system of passenger cars comprises three major subsystems: two wipers and their arms; a mechanism; and an electric motor.The concept of this proposed wiper system is similar with other existing conventional wiper.A wiper generally consists of a metal arm; one end pivots, the other end has a long rubber bladeattached to it.In the research process The automated rain wiper system is used to detect rainfall and activate automobile rain wiper automatically without driver interaction. Finally the purpose of the project to design the winshield wiper control system for safety ness of the peoples to drive car,bus,truck...etc.

INTRODUCTION

Wiper is an essential component that used to wipe the raindrops or any water from the windscreen. Wipers are designed and made to clear the water from a windscreen. The wiper parts visible from outside the car are the rubber blade, the wiper arm holding theblade, a spring linkage, and parts of the wiper pivots. The wiper itself has about six parts called pressure points or claws that are small arms under the wiper.Existing system manually used control stalk to activate wiper and the process of pulling up wiper and the driver needs to switch on and off the control stalk.

SOFTWARE USED :

1.STM32 CUBE IDE.

COMPONENTS :

1.STM32F40766VG MICROCONTROLLER BOARD.

DESCRIPTION:

STM32F407VG DISCOVERY:

The STM32F405xx and STM32F407xx family is **based** on the high-performance Arm® Cortex®-M4 32-bit RISC core operating at a frequency of up to 168 MHz. The Cortex-M4 core features a Floating point unit (FPU) single precision which supports all Arm single-precision data-processing instructions and data types. The Cortex-M4 core features a Floating point unit (FPU) single precision which supports all Arm single-precision data-processing instructions and data types. It also implements a full set of DSP instructions and a memory protection unit (MPU) which enhances application security. The STM32F405xx and STM32F407xx family incorporates high-speed embedded memories (Flash memory up to 1 Mbyte, up to 192 Kbytes of SRAM), up to 4 Kbytes of backup SRAM, and an extensive range of enhanced I/Os and peripherals connected to two APB buses, three AHB buses and a 32-bit multi-AHB bus matrix.

USES OF STM32F407VG MICROCONTROLLER:

- It printing and scanning machines this device is used. Heat ventilation AC system, security systems, also used this device. In different types of devices used in homes comprises of this module.
- The module can be found in a variety of household products.

[illegible]

- The STM32F407VG Discovery board uses STM32F407VGT6 microcontroller which has ARM Cortex-M4 processor, which is capable of running up to 168MHz. This MCU has many peripherals such as GPIO ports, TIMERS, ADCs, DACs, Flash Memory, SRAM, SPI, UART etc. The processor and peripherals talk via BUS-Interface. There are three busses available.
- I-BUS (Instruction Bus) D-BUS (Data Bus) S-BUS (System Bus) I-BUS This bus connects the Instruction bus of the Cortex®-M4 with FPU (Floating point unit) core to the BusMatrix. This bus is

used by the core to fetch instructions. The target of this bus is a memory containing code (internal Flash memory/SRAM or external memories through the FSMC/FMC).

- **D-BUS** This bus connects the databus of the Cortex®-M4 with FPU to the 64-Kbyte CCM data RAM to the BusMatrix. This bus is used by the core for literal load and debug access. The target of this bus is a memory containing code or data (internal Flash memory or external memories through the FSMC/FMC).
- **S-BUS** This bus connects the system bus of the Cortex®-M4 with FPU core to a BusMatrix. This bus is used to access data located in a peripheral or in SRAM. Instructions may also be fetched on this bus (less efficient than ICode). The targets of this bus are the internal SRAM1, SRAM2 and SRAM3, the AHB1 peripherals including the APB peripherals, the AHB2 peripherals and the external memories through the FSMC/FMC.

WORKING PPRINCIPLE :

the automobile is the STM32F407VG Discovery Microcontroller. If the button is pressed , the first led (red) will turn on, Clicking again the wiper will starts , and the second Blue LED Blinking will turn on for a desired rate. If the button is pressed again , the third GREEN LED Blinking will turn on, and the wiper's speed will be increased in comparison to the previous one. The fourth press will turn on the fourth ORANGE LED Blinking , and the wiper speed will be increased in accordance with the previous one. The microcontroller (vehicle) is turned off after the fifth click of the button.

IGNITION-ON STATE :



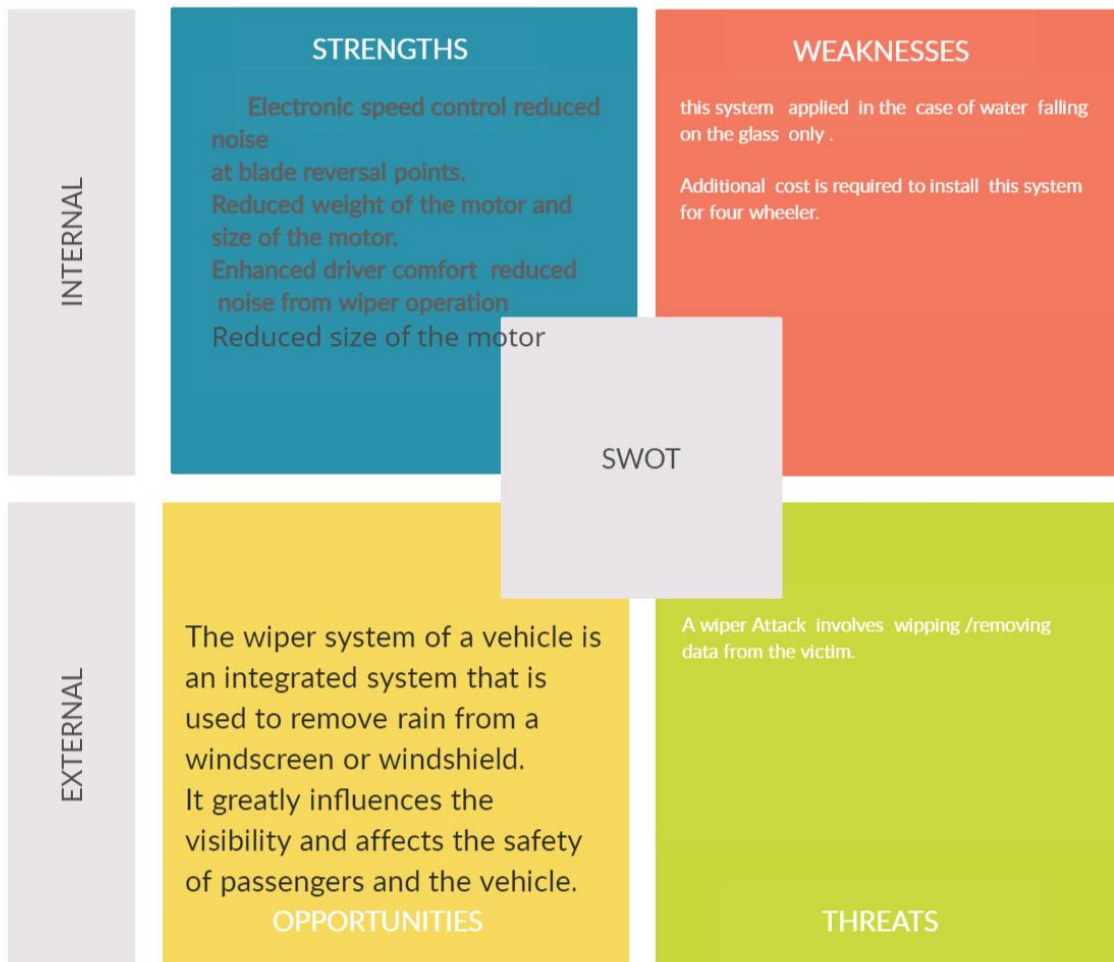
Wiper ON & Working :



IGNITION-OFF STATE :



SWOT ANALYSIS:



FLOWCHART :

