Faculty of Electrical and Electronic Engineering Technology

CONTROL OF HOUSEHOLD FAN SMART HOUSE APPLICATION

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Bachelor of Electrical Engineering Technology (Industrial Power) with Honours

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CONTROL OF HOUSEHOLD FAN SMART HOUSE APPLICATION

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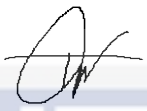
Signature : 

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DEDICATION

To my mother, Salmah Binti Selamat and my father, Rosdi Bin Abdul Ghapa, I want to say that I love you very much.

ABSTRACT

Earlier models of generation require more human efforts. Still, in modern times every technology evolves into an advanced version by operating automatically so that the auto fan can be reinvented to make it more innovative in this project. Fans make people feel more relaxed but don't lower the temperature of the room. It automatically runs according to the surrounding temperature and will be automatically switched under a specific temperature to save energy. Because of existing fans, the speed of each fan, depending on weather conditions, is challenging to monitor. The idea behind the controlled intelligent ventilation temperature is to control fan speed using a micro controller based on temperature changes detected by the sensor's temperature and humidity. In addition to homeowners, schools, companies, and other public buildings can benefit from this intelligent feature in a fan as they have a specific routine. This project work is therefore done to minimize human effort and simultaneously save energy, which takes an hour.

ABSTRAK

Model generasi terdahulu memerlukan lebih banyak usaha manusia. Namun pada zaman moden ini, setiap teknologi berkembang menjadi versi lanjutan dengan beroperasi secara automatik sehingga kipas automatik dapat diciptakan semula untuk menjadikannya lebih inovatif dalam projek ini. Kipas ini membuatkan orang berasa lebih santai tetapi tidak menurunkan suhu bilik. Secara automatik berjalan sesuai dengan suhu sekitarnya dan secara automatik akan diubah di bawah suhu tertentu untuk menjimatkan tenaga. Dengan kewujudan kipas ini, kelajuan setiap kipas ini bergantung pada keadaan cuaca dan sukar untuk dipantau. Idea di sebalik suhu pengudaraan pintar yang terkawal adalah untuk mengawal kelajuan kipas menggunakan mikrokontroler berdasarkan perubahan suhu yang dikesan oleh suhu dan kelembapan sensor. Selain pemilik rumah, sekolah, syarikat, dan bangunan awam yang lain dapat memanfaatkan kelebihan yang ada pada kipas ini kerana mereka memiliki rutin tertentu. Oleh itu, kerja projek ini dilakukan untuk meminimumkan usaha manusia dan sekaligus menjimatkan tenaga yang memakan masa satu jam.

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This project would not have been possible without my supervisor, Ts Mustafa bin Manop Mustapha, who provided invaluable advice, words of wisdom, and patience.

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Finally, I'd want to express my gratitude to all of my fellow students, faculty members, and those who aren't included for their cooperation and assistance.

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° - Celcius
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LIST OF ABBREVIATIONS

IoT	-	Internet on Technology
PWM	-	Pulse Width Modulation
LCD	-	Liquid Crystal Display
LED	-	Light Emitting Diode
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CHAPTER 1

INTRODUCTION

1.1 Background

Normally, the fan's speed must be manually adjusted, however from this concept, the fan's speed will automatically adapt dependent on the surrounding environment. The initiative is going to shift its attention to the (IoT). In this scenario, the temperature is to beregulated, and the emphasis is on the rationale for building an automatic temperature control system. The fan offers comfort for the customer. DHT11 sensors have been used to control temperature. The DHT11 is a low-cost digital temperature sensor. It uses an electrical phenomena and an electronic component to breathe the surrounding air and outputs a transmitted data on the data pin. It is simple to use. However data collection takes longer since the DHT11 sensor data transfer to micro controller circuit, that is comprised of ESP8266. Arduino is a software- controlled open-source electronics board. It increases the accessibility of electronic design to everyone who want to create it in the proper setting. Afterward, the temperature sensor read the temperature. The ESP8266 will control how fast a fan can run. The temperature and speed will be shown on the Blynk App and Thingspeak after that.

1.2 Problem Statement

When room temperature changes, most people feel it is uncomfortable to change the fan speed manually. Beside that, people right now do not know the effect of their daily action by wasting a lot of electrical consumption. Thus, the automatic ventilator system is

recommended for solving this problem, which automatically modifies the speed levels according to temperature changes.

1.3 Project Objective

The goals of this study are:

1. To measure the temperature and humidity in room
2. To achieve a functional system in terms of hardware and software.
3. To create a smart fan system to monitoring the result using IoT.

1.4 Scope of Project

1. Smart control of energy saving on fan in the room to explore the future development for intelligent home appliances by means of energy saving efficiency.
2. To build and write a programme with Arduino and a hardware component.
3. To see if the system is good for the real world and if it has good things or bad things about it.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter will talk about the theory that goes into this project. Beside that, the previous research that I gained has been understudy in order to gain valuable data for this project. It also helps me to finish this project. In this study, a basic design of smart electrical appliances which is smart fan was developed using an ESP8266microcontroller and a DHT11 for the purpose of controlling the fan's speed. A set of people used the prototype and provided feedback after using it. The study's findings reveal that the automation was beneficial to their overall feeling of well-being. The setting and ambiance in the room were said to be fine, since the fan was only quiet and behind the scenes. This has demonstrated that the prototype has a considerable impact in reducing participant's levels of anxiety and nervousness while promoting a feeling of relaxation and comfort, while also contributing to both cost and energy savings [1].

2.2 MICROCONTROLLER BASED SMART FAN SYSTEM

This project revolves around a fan that uses a micro cntroller system to control it. This project is produced using the method of construction, assessment and control of an electric fan that runs on its own. The problem statement from this project is that most people do not feel comfortable to change the fan temperature when the room temperature has changed. As the primary controller, the MC68HC11 has a temperature controller as an input and a DC motor as an output. [2]. The electric fan of this system contains a combination of sensors, controllers, drivers and motors.

The integration of the modules results in the production of a system that can be divided into two main parts. The first is an intelligent fan system, and the second is a monitoring system, which can be divided into two phases. It is the first phase of the system, including microcontroller, sensor, and motor module. It is the second phase, which includes an LCD module for system monitoring. For example, the automatic fan system will provide outputs in four levels with the detected input, as shown in the figure below. The information detects at different levels, triggers the same amount of production, and shows the status of the output and the temperature on the LCD panel for each level felt by the input.

2.3 TEMPERATURE BASED FAN SPEED CONTROLLER

In this project, microcontrollers play a key role in smart systems development. It uses PWM or Pulse Width Modulation as this fan's speed can be controlled by one of the ways that it can do this. In addition, the project uses a temperature sensor to detect the temperature so that the fan speed can rotate according to the set speed and temperature. Knowing how the Arduino controller works is very important because this will control the cooling system, so it's very important to know how it all works together well. [3].

The project uses an LCD shield to display the temperature and speed for the fan. 9V batteries are used to power the fan motors and transistors. In addition, the LM35 temperature sensor and red LED get a power supply of 5V from the Arduino board. The most crucial step is to set the Min and temp variables to the values you want them to have. The minimum temperature is when the fan starts rotating, and the maximum temperature is when the red warning light flashes, indicating that the maximum temperature has indeed been reached.

2.4 PIC SYSTEM TO CONTROL THE ELECTRIC FAN

This project is essential for developing an innovative prototype design for an electric fan that has the ideal combination. The automation feature of this electric fan is connected to the microcontroller. It also boasts a unique dual feature design. It is done to ensure that the cooling process runs better effectively and successfully, especially in significant space uses and in hot weather due to global warming[4]. Humans live a better life and the lives of the circuit's use. It is pretty practical for older folks to simplify their lifestyles in this way. The course is also good for people who are physically disabled and find it hard to switch on the fan the right way. It can also be changed to make it better at detecting things like fires in the house, so it can send out an alarm signal when there is an emergency, like when there is a fire in the house.

2.5 AUTOMOTIVE SYSTEM TO CONTROL THE FAN

In this project, the concept of a microcontroller-based auxiliary fan for automotive use, a prototype is being developed. The fan should operate following the engine's temperature and rpm, and it should be adjusted manually. The Arduino Mega, made of the Atmega1280 microcontroller, was employed in the present study as the controller. Production of the limited scale simulation model, where the microcontroller is verified to guarantee that it interacts with the necessary sensor, will become the objective of this research previous to its conversion into an actual functioning protype. They measure humidity using a humidity sensing component that consists of two electrodes connected by a moisture-retaining substrate[5].

2.6 SMART FAN CONCEPT

Because of its cheap running costs and low power consumption, the electric fan is one of the most popular electric appliances. [6]. It's a common circuit that's seen in a variety of applications[7]. A fan's functioning is now controlled manually by pressing the switch. This additional feature keeps it from automatically turning on in response to temperature changes. For switching in this circuit, an automated temperature control system is employed. Many research focusing on the use of automated temperature control systems in a variety of industries might benefit from its advantages [8]. One of the most complex version include occupancy sensorsand geolocation settings to ensure it only rotates when needed.

Smart ceiling fans, as opposed to regular ceiling fans to operate by Wi-fi rather than a pull cord or electrical wire. This means you can monitor and control your iOS or Android computer to operate according to a predefined schedule even when you're not at home.Older ceiling fans may be converted to smart fans by hardwiring tiny device inside the fan, using a hub and their existing motorised blind ir remote control or replacing their wall switch with a version that linksand controls the fan. Yes, smart fans can help you save energy in your house (and wallet). Instead of having your fans on all day when you far from home, you can use temperaturesensors to make them turn on just when the temperature in your room climbs beyond a specifiedthreshold.

Fan materials are an important consideration when designing and manufacturing a centrifugal fan. The materials chosen in building can have an impact on weight, cost, sanitation,longevity, maintenance, and aesthetics.

CHAPTER 3

METHODOLOGY

3.1 Introduction

An Arduino, temperature sensors, and humidity sensors will be used in this research to adjust the fan speed automatically. If this concept is realise, the fan's speed will be automatically changed in response to the surrounding environment. Every time, the fan speed must be manually adjusted. The project is based on the IoT. It was using a DHT11 sensor, a simple strategy for controlling the fan speed automatically. The resistance of a fan will be changed in response to the temperature and humidity detected by temperature and humidity sensor. It's pretty simple to use, but it does necessitate some careful planning to collect data. The DHT11, ESP8266, by many of the same fan connection, which means less battery power will be required. The proposed system allows for a relatively high fan setting for lower activity levels that require limited body movements, such as sleeping and sitting is used in this example. It takes less time to process data using this proposed system.