



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**DEVELOPMENT OF AN INTERACTIVE PLANT
MONITORING DEVICE BY USING ARDUINO
MICROCONTROLLER**

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electronics Engineering Technology (Telecommunications) with Honours.

by

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I hereby, declared this report entitled “DEVELOPMENT OF AN INTERACTIVE PLANT MONITORING DEVICE BY USING ARDUINO MICROCONTROLLER” is the results of my own research except as cited in references.

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electronics Engineering Technology (Telecommunications) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Tukang kebun menyampaikan pelbagai jenis tumbuhan yang akan mempunyai keperluan penyiraman yang berubah-ubah untuk setiap tumbuhan mesti mendapatkan ukuran sempurna air. Ukuran air yang tidak munasabah boleh memelihara asas-asas tumbuhan dari oksigen dan memikirkan prosesnya menjadi busuk; terlalu kurang air dan kilang itu sekarang tidak dapat memupuk nutrien dalam keinginan untuk terus sedia ada. Seorang tukang kebun mesti memenuhi keperluan air setiap tumbuhan dengan matlamat akhir untuk mengekalkan tahap kesejahteraan hidup. Selain itu, tukang kebun kebanyakannya tidak tahu bagaimana karakter yang ditunjukkan oleh tumbuhan dan bukan haiwan peliharaan di mana mereka dapat menunjukkan sikap mereka semasa mereka lapar, haus, merasa panas, merasa sejuk, membosankan, tidur dan sebagainya. Tanpa menghiraukan mana-mana iklim, terlalu panas dan kering atau terlalu rendang dan basah, anda perlu mempunyai pilihan untuk mengawal ukuran air, suhu dan keperluan asas yang tiba di tumbuh-tumbuhan anda. Penjelajahan ini tertumpu pada cara terbaik untuk membina rangka kerja yang menggunakan Arduino yang mengawal semua parameter yang diperlukan untuk kehidupan tumbuhan pada masa yang ideal. Juga, projek ini dicadangkan tanpa memerlukan automasi kerana kami mahu ia menjadi menyeronokkan secara interaktif seperti memainkan permainan "Pou" secara sebenar dari segi tumbuhan. Rangka kerja yang paling munasabah telah dipilih untuk menjadi sumber pemikiran dan arahan. Seorang yang berfikir mencadangkan untuk memperbaiki cara untuk menangani kerangka kerja yang sedia ada. Segmen terakhir dan bahan yang dijangka membantu rangka kerja pengendalian mahir diperoleh dengan memecah dan menguji model.

ABSTRACT

Gardener convey a wide range of plants which will have fluctuating watering requirements for each plant must get the perfect measure of water. An unreasonable measure of water may keep the plant's underlying foundations from oxygen and thought process them to decay; too less water and the plant will now not get hold of the nutrients in wishes to keep on existing. A gardener must cater for each plant's watering needs with the end goal of keeping up an elevated level of wellbeing in their life. Plus, gardener mostly do not know how was the character shown by plant instead of pets where they could show their attitude while they are hungry, thirsty, feeling hot, feeling cold, boring, sleeping and etc. Regardless of whichever climates it is, either excessively hot and dry or excessively shady and wet, you need to have the option to control the measure of water that arrives at your plants. This exploration concentrated on the best way to build up a framework utilizing Arduino that controls all the parameter required of plants life at the ideal time. Also, this project are proposed as no automation needed as we want it to be interactively fun like playing a "Pou" game for real in terms of plants. The most reasonable framework had been chosen to be a source of thoughts and direction. A possess thought proposed to improve the ways to deal with existing frameworks. The last segments and materials expected to help a proficient controlling framework were acquired by breaking down and testing the models.

DEDICATION

A special thank you to my beloved parents my dad names Idrus Bin Saidin and my mom is Hazila Binti Abdullah for your unconditional support regarding my studies. I am very honored to have both of you as my parents. Thank you for trusting me and giving me chance to proving my success in study and improving myself through my life.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter able an overview of the watering device for the plant. The problem background and problem statement are defined subsequently. That is followed by the useful resource of research objectives and scope which includes the improvement of irrigation tool with a low-fee that may be observed and that easy way to a human.

1.2 Background study

This assignment about the monitoring system for the plant as a remoting system and get the measurements of the observing system for a user. The procedure software will be use in this test by utilizing the Arduino as a microcontroller. These undertakings incorporate an essential information which is temperature sensor and a clock set on MIT Apps while identified with the Arduino for conveying the signal to hit upon the plants. At the point when the sensor detect the condition surrounding of the plants, for example if the temperature reach at more than the parameter set which is in excess of 29 degree Celsius, Arduino will send the signal and the emoji on Android MIT Apps will change and the subsequent relay will contact to send data to the fan to launch it and cooling down the temperature until it return to its normal condition which is below 29 degree Celsius and above 5 degree Celsius

1.3 Problem Statement

These days, people outperformed by the development of innovation could give off an impression of being a top notch perspective sure to individuals and machines. This reflect the of innovation for the entirety of every day presence of the man or lady on the indistinguishable time, individuals become being busy with everything for a total day and numerous plants don't conscious by a user and accordingly, it transforms into hard for them to hold their plants healthy and alive. In spite of the way that, there are different other options, alongside contracting somebody to water the plant occasionally, yet that is might need to swallow various charges. They are stressed over their home assurance and does never again accept the laborer with no any supervise the worker. Furthermore, the water plant is the duty exhaustion quality and reason to man busy. In addition, people can't determine the plant necessities at every day not at all like pet where they can make a sound and show their response towards human. So based on the above, we imagine that it is miles imperative to implement the remoting machine where a human can interact along with their plants so as to take care of their plant on all the exceptional aspects of a home gardening gadget in addition to large landscape (for the gadget dependent on agricultural farming) and encourages them to become healthy. Other than that, typical individuals does not constantly able to estimate the significant level of water wished through plant to restores the needs required by a plant. At that point, there was a situation in which regardless of the way that the plants is watered occasionally, the plants would still die. In fact, it is because of the plant probably also have significantly low or over water.

1.4 Objectives

The main objectives of this project are:

- i. To develop an interactive system gardening for people by using an Arduino.
- ii. To implement a remote controlling system using multi sensors.
- iii. To analyze the performance plant monitoring system by using Arduino to controlling the plants.

1.5 Scope of work

Scopes are recorded to ensure the project will be inside its expected point of confinement. The scope will be functional to ensure those project is going in the correct course with achieve the goal. In structuring the plant monitoring, we concern on making a portable monitor to build comprehensively and importance as the concept is plan for a busy gardener. With a light and medium size, the board is capable or as it were is portable to be available consistently.

This project proposes an interactive plant monitoring that uses Android, LDR, DHT, Sound sensor as the application whereby the plant monitoring are interactively apply emoticon shown on Android phone as an expression to show what they really needs at a certain time. Then, the plant monitoring also will prompt data based on the sensor value obtained on Android phone screen. The user is required to click on the reaction by click on the provided button right after the emoticon changes from normal condition into something else like hungry, thirsty, boring and etc. Then, the plant monitoring will return to the normal condition right after their needs has been fulfilled. The block diagram

comprise of a controller, inputs and outputs. The Android phone is utilized to show the emoticon of the output. The secondary screen comprises of a 16 characters x 2 lines LCD for showing the value for temperature and humidity value of surroundings. The I2C module is attached as interface between Arduino Mega and 16 x 2 LCD so as to reduce number of pins associated with Arduino Mega. Concerning in the container, which comprise a circuit alongside the Arduino and multi sensors alongside its tunnel where the process being taken. We utilized a multi sensor which will be place in a tunnel so as to get the reading of the temperature and humidity to be show onto the Android phone. As to control their optimum plants growth by watering and turn on the fan. Also, in facts as for plant growth, light intensity color like blue, red and green, add fertilizer and music helps in plant growth which is the reason it is being implanted on the monitoring parameter.

1.6 Project contribution

This project will useful to the society mainly for those are occupied with tight schedule whose do no longer have the opportunity to watering their plant, the humans that generally overlook to water the plant, the humans that always pass traveling and outstation. Except that, this project proposed a solution via imparting a way and system to encourage human in a watering plants.

Similarly, studies on the system's techniques and technique can be used to develop in order that relevant in the various areas consisting of watering the plantation

with a massive variety of plants. This task additionally contributes thoughts for analysts to create watering and water system framework the usage of Arduino system.

1.7 Thesis structure

In Chapter 1, it will be explain briefly about the possibility of the project. Tasks background will be discussed in this part. This part will concentrated on the outline of the undertaking, specifying the objective, the issue articulation, and the scope of the project.

In chapter 2, this section is about the idea, hypothesis, and some characteristic of equipment and component that utilized as a part of this task. This part also contain a meaning of term used as a part of this undertaking and furthermore discusses about the idea of the research and how it identified with the theory.

In chapter 3, this section will explain about the methodology. Methodology chapter is a steps that need to be follow and detailed reports of studies that need to be complete to achieve the objective. This chapter explains the procedure taken to complete the project and it consists the detail about the development of this project.

In chapter 4, this section will explain about the expected result and discussion that we obtain based on the methodology that are used. All the data collection and analysis obtained were discussed in detail. The expected results were compared with the outlined objectives in order to state some hypothesis and conclusion.

In chapter 5, a conclusion based on the expected result will be explained. In this section, a conclusion will be made according to the work that have been done in Final Year Project (FYP 2).

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

As for this chapter, a few of articles and publication journals from Scopus site are investigated dependent on the scope as figure 2.1 beneath. A couple of keyword is utilized to locate the related data which is plant monitoring and interactive. This research focuses around the formation of plant monitoring that are associated with the application to improve the techniques and time-schedule learning for user which is a significant coverage for future critical thinking. To finish this project, article about plant monitoring has been found. Twenty articles about plant monitoring are pick.

PAST RELATED RESEARCH

The exploration data will concentrate on the interactive plant monitoring for personal purpose. Choice of research materials relies upon what item and hardware that used to build up the venture. The source must be acceptable in the framework format, for example, books, journals, articles and website that are authorized.