



Faculty of Electrical and Electronic Engineering Technology



DEVELOPMENT OF SOURSOP TREESHAKER USING MOBILE APPLICATION

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Bachelor of Electronics Engineering Technology (Industrial Electronics) with Honours

2021

**DEVELOPMENT OF SOURSOP TREESHAKER USING MOBILE
APPLICATION**

AMIRUL SYAFIQ BIN AZHAR

**A project report submitted
in partial fulfillment of the requirements for the degree of
Bachelor of Electronics Engineering Technology (Industrial Electronics) with
Honours**



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DECLARATION

I declare that this project report entitled “DEVELOPMENT OF SOURSOP TREESHAKER USING MOBILE APPLICATION” is the result of my own research except as cited in the references. The project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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I hereby declare that I have checked this project report and in my opinion, this project report is adequate in terms of scope and quality for the award of the degree of Bachelor of Electronics Engineering Technology (Industrial Electronics) with Honours.

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DEDICATION

I dedicate this thesis to my beloved parents, supervisor, and my fellow friends. May Allah bless them.



ABSTRACT

Engineers are creating modern technology widely nowadays, and new technologies will be launched around the world every day that will make human life faster and more efficient. The Internet of Things (IoT) is one of the greatest discoveries ever made by engineers around the world. The wireless automation system is one of the Internet of Things (IoT) applications that allows the control and monitoring of any item such as a tree for example. The soursop tree has its uniqueness in that it is what we called hermaphrodite, the male and female reproductive organs are found in the same flower. The maturity of the flower through two phases, the female phase and the male phase occurs at different times. The female phase starts as early as 4 to 5 pm while the male phase is 8 to 9 pm. The Malaysian Department of Agriculture has created a device called the 'muricata shaker' to help growers to produce a bigger fruit in short time. This technology has been proven to increase the percentage of fruit formation up to 90% compared to natural pollination. The goal of this project was created to assist in the transfer of pollen to the stigma by the method of shaking. When the shake is made, the available pollen will be transferred to the still sticky stigma (in the case of the flower petals still closed). This activity will produce perfect pollination to the entire stigma, will give a more beautiful fruit shape with an average weight of 2-3 kg/seed. Looking at this problem I have created a shaking device by connecting the device to a phone. Users of this tool do not need to go to the tree when the female flower is maturing, which is at 8 pm-10pm, they only need to activate this tool using a mobile phone only and this shaking tool will vibrate. This project makes it easier for those who own soursop tree to get fruit faster as well as a larger fruit size compared to natural pollination.

ABSTRAK

Jurutera mencipta teknologi moden secara meluas pada masa kini, dan teknologi baru akan dilancarkan di seluruh dunia setiap hari yang akan menjadikan kehidupan manusia lebih cepat dan efisien. Internet of Things (IoT) adalah salah satu penemuan paling hebat yang pernah dibuat oleh jurutera di seluruh dunia. Sistem automasi tanpa wayar adalah salah satu aplikasi Internet of Things (IoT) yang membolehkan kawalan dan pemantauan apa sahaja barang seperti contoh pokok. Pokok durian belanda memiliki keunikannya dimana bersifat hermafrodit iaitu organ pembiakan jantan dan betina terdapat pada bunga yang sama. Kematangan bunga melalui dua fasa iaitu fasa betina dan fasa jantan berlaku pada waktu yang berlainan. Fasa betina bermula seawal pukul 4 hingga 5 petang manakala fasa jantan pukul 8 hingga 9 malam. Jabatan Pertanian Malaysia telah mencipta satu alat dipanggil 'muricata shaker' untuk membantu para pekebun untuk menghasilkan buah yang lebih besar dan juga cepat. Teknologi ini terbukti mampu meningkatkan peratus pembentukan buah sehingga 90 peratus berbanding pendebungaan secara semula jadi. Matlamat alat ini dicipta bertujuan membantu pemindahan debunga kepada stigma dengan kaedah gegaran. Apabila gegaran dibuat, debunga yang tersedia akan dipindahkan kepada stigma yang masih melekit (dalam keadaan kelopak bunga masih tertutup). Aktiviti ini akan menghasilkan pendebungaan yang sempurna kepada keseluruhan stigma, akan memberikan bentuk buah yang lebih cantik dengan berat purata 2-3 kg/biji. Melihat pada permasalahan ini saya telah mencipta sebuah alat gegaran dengan menghubungkan alat tersebut dengan telefon. Pengguna alat ini tidak perlu ke pokok pada masa bunga betina sedang matang iaitu pada jam 8pm-10pm, mereka hanya perlu mengaktifkan sahaja alat ini menggunakan telefon bimbit sahaja dan alat shaking ini akan bergetar. Projek ini memudahkan mereka yang memiliki pokok durian

belanda untuk mendapat buah dengan lebih cepat serta saiz buah yang lebih besar berbanding pendebungaan semulajadi



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LIST OF SYMBOLS

δ	-	Voltage Angle
MHz	-	Megahertz
MM	-	Length
RPM	-	Rotation Per Minute
A	-	Ampere
V	-	Volt
kHz	-	Kilohertz



LIST OF ABBREVIATIONS

IoT	-	Internet of Things
DC	-	Direct Current



LIST OF APPENDICES

APPENDIX

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CHAPTER 1

INTRODUCTION

1.1 Background

The soursop tree is a unique tree that is different from other trees in that having female seeds and male seeds results in the natural fertilization process being somewhat less successful. There are three ways that can help the fertilization process, the first is, natural pollination through bees or ants, human intervention such as using cotton buds to combine male and female pollen and lastly and the most productive method which is to shake the tree for male and female pollen combination during productive time, 5 pm- 7pm and 8 pm-10pm. I have created such a vibration device that uses a vibration motor and is connected to the esp8266 relay module. By just using the apps on the phone I can control the shaking device without having to go to the tree at pollination time.

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1.2 Problem Statement

Those who own soursop tree are certainly disappointed and despairing because the process of becoming fruit is too long because the natural pollination rate of this tree is less successful. So there are several ways to help pollination and the most effective way is to shake the tree for male and female pollen combination during the productive time.

5 pm-6pm and 8 pm-10 is productive time for the male and female so at this time the pollen of the tree should be shaken to help the pollination process. No problem if shaken in the evening but will probably have problems at night due to the risk of dangerous animals in the forest. Therefore, this tree shaker device can help shake twigs without the need to go to the tree just by using a mobile application.

With the help of the IoT mobile application it can turn on three motors at the same time, I also made apps to control the time delay speed of the moto. According to the passage of time where mobile phones are mandatory devices so this tree shaker can also be activated easily using mobile application.

1.3 Project Objective

The main aim of this research is to develop soursop tree shaker using mobile application with internet of thing. IoT tree shaker will help those who have soursop to shake the tree during the pollination time. Following methods is performed appropriately with investigate target that have been found such as

1. To develop periodic new soursop tree shaker system to replace conventional system
2. To study which are the best methods to shake the male and female pollen for soursop pollination

1.4 Scope of Project

The scope uses for doing this project :

- a) Proteus
- b) Blynk application
- c) ESP8266 and Relay module
- d) Only for soursop tree

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

A survey of several sources on a development of soursop tree shaker using mobile application will be discussed in this chapter, which is a literature review. This chapter will present and provide an overview of some systems that used similar to my research. This chapter will also discuss example project that uses the vibration motor. I want to shake the powder using vibration motor and this chapter will also go over the components that could be used.

2.2 *Annona muricata*/soursop

The oil mining of marolo and soursop seeds is analyzed with various solvents (acetone, ethanol, isopropanol and hexane) and three different techniques (ultrasound, shaker, and soxhlet) and acidic enzyme extraction. But in this article the author told when compared to shaker the ultrasound is much affective, [1].

2.3 Motor

Based on my project, I decided to use a suitable vibration motor to shake the soursop powder, the Dc motor that i have been selected must be followed accordingly to my project requirement

2.3.1 Vibration motor

Regarding haptic technology, the author had something to say. This is a tactile technology that uses power, vibration, or gesture to stimulate consumers' sense of touch. Electric stimuli, such as the vibrating mode on a phone, can be used to alert users to pay attention to incoming signals. Furthermore, haptic technology can be used to remind users that they are receiving feedback from prior motions, as is common in gaming systems. Vibration motors are small coreless DC motors that vibrate instead of making a sound to indicate that a signal has been received. Vibration motors can be found in a wide range of devices, including cell phones, handsets, pagers, and other similar devices. The permanent magnet coreless DC motor retains its magnetic properties (unlike an electromagnet, which acts as a magnet only while an electric current passes through it); another important feature is the motor's small size, which makes it lightweight. Furthermore, the engine produces no noise and uses extremely little electricity when in use. The motor's output is highly dependable as a result of these characteristics.

1) Coin vibration motor

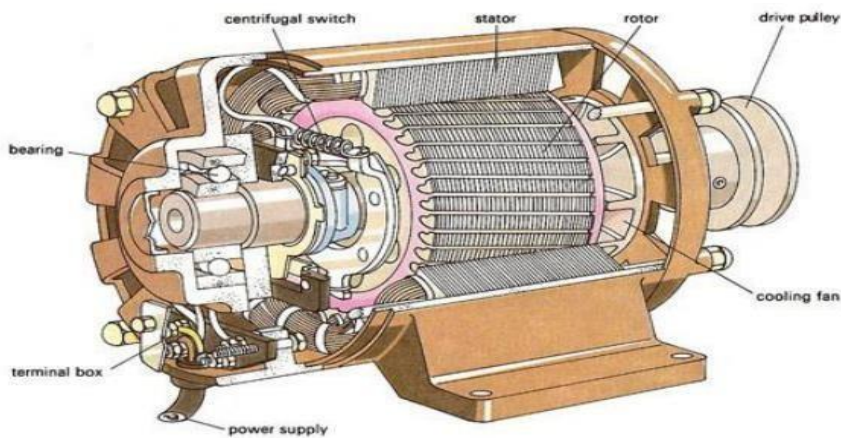


Figure 1 Coin vibration motor

1) Rotor

Figure 1 above shows the rotor of a rotary electric motor is the non-stationary component. The motor's wires and magnetic field are arranged in such a way that torque is produced around the rotor's axis. The rotor will act as the motor's armature in certain designs, supplying the input voltage through it

2) Stator

A rotary electric motor's stator is the stationary component. It could be used to generate motion by acting as a magnet field that interacts with the armature. Another feature of the stator is that it can serve as an armature, receiving its influence from the rotor's moving field coils.

3) Commutator

A switch is a rotary electrical switch for some electric motors or electrical generators which periodically reverses the current route to the external circuit between the Chen 6 rotor. It has the best power on the rotor in the engine and does the same in rotor

4) Armature

The armature in this motor is made up of a stack of thin metal plates with thin copper wire coiled around each of the three armature poles. (The operation of an electric motor) The armature's primary purpose is to transform magnetic energy into kinetic energy.

5) Winding

Windings are made up of a number of coil turns. When electricity is passed through these coils, a magnetic field is produced.

6) Weight

A weight mass must be added to the shaft in order to provide a vibrating alert. Vibration can be accomplished by using a high-speed weight displacement. Furthermore, the force's magnitude can be monitored and modified, and the factors that can influence it will be addressed further down. Brushes are used to create a variety of effects.

7) Brushes

The brushes in the motor shaft conduct the current between the stator and the coils. The motor's life is determined by when the brushes wear out. Brushless dc motors, also known as BLDC, are used to prolong the life of motors based on this aspect.

2) Bar-type vibration motor

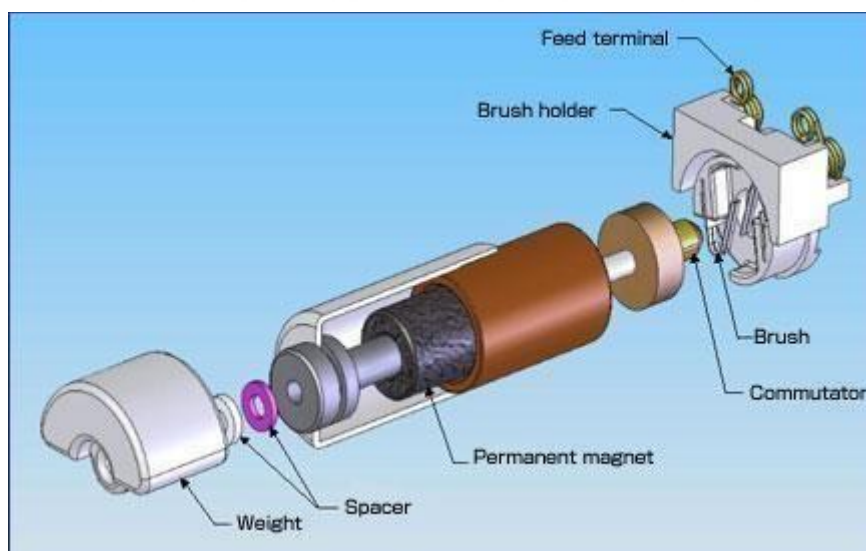


Figure 2 Bar-type vibration motor