



**DIPLOMA KEJURUTERAAN ELEKTRONIK (KOMPUTER)**

**POLITEKNIK SEBERANG PERAI**

**MINI SPY CAMERA ROBOT**

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**KEMENTERIAN PENGAJIAN TINGGI MALAYSIA**



**DEE6092 – PROJECT 2**

**DEPARTMENT OF ELECTRICAL ENGINEERING**

**MINI SPY CAMERA ROBOT**

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# FINAL PROJECT REPORT

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## AUTHENTICATION OF REPORT PROJECT

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## APPRECIATION

We wish to express our sincere gratitude to Puan Wan Sabariah Bt Wan Ismail for her guidance and encouragement in carrying this project work. We greatly indebted to Puan Wan Sabariah Bt Wan Ismail for providing her valuable guidance at all stages of the study, her advice, constructive suggestions, positive and supportive attitude and continuous encouragement, without which it would have not been possible to complete the project.

Our wholehearted thanks and appreciation to Puan Wan Sabariah Bt Wan Ismail for her cooperation and assistance during the course of our project.

We hope that we can build open the experience and knowledge that I have gained and make a valuable contribution towards this industry in coming future.

## **ABSTRACT**

Mini Spy Camera Robot is the robot that has ability to spy and to survey a situation at certain place using Wifi Camera. Mini Spy Camera Robot can be viewed by human directly. The robot also can be controlled wirelessly using application Laptop or PC (Personal Computer). This robot also equipped with sensors to avoid dangerous situation. The robot is powered by Arduino program and Wifi Camera for camera processing. The goal of this project is construct a Mini Spy Camera Robot which would help to monitor all the thing through a camera and develop the movement of the robot wirelessly control using application in Laptop using Bluetooth transmission.

## **ABSTRAK**

Mini Spy Camera Robot adalah robot yang berkeupayaan untuk mengintip dan melihat persekitaran sekeliling atau situasi dengan menggunakan kamera tanpa wayar. Robot ini juga boleh dikawal secara tanpa wayar menggunakan perisian sistem pada komputer riba. Tambahan pula, projek ini juga dilengkapi dengan beberapa sistem pengesanan yang dapat menyesan halangan atau bahaya dihadapan dan dikawal oleh Arduino. Kepentingan bagi projek ini adalah untuk membina sebuah robot yang dapat melihat sekelilingnya menggunakan kamera dan membangunkan perisian sistem yang boleh mengawal pergerakan robot tanpa wayar dengan menggunakan isyarat perhubungan teknologi bluetooth.



# CONTENTS

	<b>PAGE</b>
<b>Recognition</b>	i
<b>Authentication</b>	iii
<b>Appreciation</b>	v
<b>Abstract</b>	vi
<b>Abstrak</b>	vii

## **Chapter**

<b>1</b>	<b>Introduction</b>	<b>1</b>
	<b>1.0 Research background</b>	<b>1</b>
	<b>1.1 Motivation</b>	<b>2</b>
	<b>1.2 Problem description</b>	<b>2</b>
	<b>1.3 System objectives</b>	<b>3</b>
	<b>1.4 System scope</b>	<b>3</b>
<b>2</b>	<b>Literature Review</b>	<b>4</b>
	<b>2.0 Concept / Theory</b>	<b>5</b>
	<b>2.1 General description</b>	<b>5</b>
	<b>2.2 Block diagram</b>	<b>6</b>
	<b>2.3 Flow chart</b>	<b>7</b>

<b>2.4</b>	<b>Component of project</b>	<b>8</b>	
	<b>2.4.0</b>	<b>Bluetooth devices</b>	<b>9</b>
	<b>2.4.1</b>	<b>Switch</b>	<b>10</b>
	<b>2.4.2</b>	<b>Wi-Fi camera</b>	<b>11</b>
	<b>2.4.3</b>	<b>Arduino</b>	<b>12</b>
	<b>2.4.4</b>	<b>Battery (9V)</b>	<b>12</b>
	<b>2.4.5</b>	<b>DC motor</b>	<b>13</b>
	<b>2.4.6</b>	<b>Capacitor</b>	<b>14</b>

<b>3</b>	<b>Methodology</b>	<b>15</b>
	3.0 Introduction	15
	3.1 Step presentation project	16
	3.2 Coding process	17
	3.3 Software requirements	20
	3.3.0 Arduino software	20
	3.3.1 Proteus software	21
	3.4 Process of designing	
	3.4.0 Design of circuit	23
	3.5 Etching	25
	3.5.0 Risk of etching	25
	3.5.1 Safety	26
	3.5.2 Etching process	27
	3.6 Drilling	
	3.6.0 Materials	31
	3.6.1 Drilling process	31
	3.7 Soldering process	33
	3.8 Insert the component	34
	3.9 Project designation	
	3.9.0 Research project	36
	3.9.1 Reformation	38
	3.10 Testing components	
	3.10.0 Multi meter	38
	3.10.1 Soldering iron	39
	3.10.2 Solder lead	40
	3.10.3 Lead remover	41
	3.10.4 Screw driver	42
	3.10.5 Plier	43

<b>4</b>	<b>Project Analysis and Discovery</b>	
4.0	Introduction	45
4.1	Component cost	46
4.2	Troubleshooting	47
4.3	Problem finding	47
<b>5</b>	<b>Suggestion and Conclusion</b>	
5.0	Introduction	48
5.1	Suggestion	48
5.2	Conclusion	48
	<b>Appendix</b>	49
	References	51

## PROJECT REPORT COMFORMATION

We hereby declare that the work in this report is our own except for quotations and summaries which have been duly acknowledged.

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# CHAPTER 1

## INTRODUCTION

The project that we created about develop a Mini Spy Camera Robot. Besides that, it can see all things in the world using its small mini camera that can be transmitted to laptop. The robot also can be controlled wirelessly using application to laptop or PC (Personal Computer).the project we design because of can save our repetitive works for humans. It can be used in the borders for detecting and disposing hidden land mines. The robot senses the surroundings through the Wi-Fi Camera. The main task of this project for used as a spying things and it as be a human eyes in difficult situation.

### 1.0 Research Background

In today's lifestyle, many of us busy with our career. You might not be able to stop the dangerous coming through you. There is a way that can help to enhance ourselves with our project which is "Mini Spy Camera Robot". It can perform difficult and repetitive works for humans. Furthermore, this "Mini Spy Camera Robot" has capability to more from one location to another location. Besides that, it can have a very risky job and such dangerous job could be done by using Mini Spy Camera Robot. Finally, this projects will be implementing using Arduino software and wireless camera.

## **1.1 Motivation**

My motivation to undertake this project is due to my experience and observation of the Mini Spy Camera Robot. Besides that, this project for used as a spying things and it as be a human eyes in difficult situation. Besides that, most of the time, it become so many problem that the baby sitter not caring on children. However, Mini Spy Camera Robot has the capacity to monitor an area in all directions continuously as a toy car's children. So, it will be useful them and we can prevent this babysitter caring problem.

## **1.2 Problem description**

In the event, most of the times we cannot protect ourselves. So that, we created a best project which is a Mini Spy Camera Robot. People faces several constraints in variety of aspect such as the difficulties in entering the building constructed new. Besides that, a bomb will explode anytime, anywhere, and the different varieties function of bomb. In this situation, it hard for soldiers to find the bomb and to dispose it.

Other else, nowadays it seems in recent year's human lifestyle become busy. In this busy lifestyle, so many parents don't have time to take care their children. So, they decided baby sitter to take care their children. But most of the time, it become so many problem that the baby sitter not caring on children. However, Mini Spy Camera Robot has the capacity to monitor an area in all directions continuously as a toy car's children. So, it will be useful them and we can prevent this babysitter caring problem.

### **1.3 System objectives**

To archive the goal of this project, there are some objectives that should archive. The objectives of project are:

- i. To design and construct a Mini Spy Camera Robot which would help to monitor all the things through a camera.
- ii. To develop the movements of the robot via wirelessly control using application in computer.
- iii. To implement the application of Arduino module in the mobile phone for operated Mini Spy Camera Robot.
- iv. To improve the project by using Arduino UNO.

### **1.4 System Scope**

The main scope of this project is to avoid human from get injury because of the explosive damage. This Mini Spy Camera Robot can display the video. The communication is Bluetooth technology that controls the signal of movement between robot and application. Other than that, we use Arduino UNO for the controller and do an installation until it can use as the objective of this project. It is amazing that I can control all the activity that necessary by just setting the coding to make an instruction.



## **CHAPTER 2**

### **LITERATURE REVIEW**

A literature review is a body of text that aims to review the critical points of current knowledge and or methodological approaches on a particular topic. Literature reviews are secondary sources, and as such, do not report any new or original experimental work. Most often associated with academic-oriented literature, such as these, a literature review usually precedes a research proposal and results section. Its ultimate goal is to bring the reader up to date with current literature on a topic and forms the basis for another goal, such as future research that may be needed in the area.

Furthermore, the Mini Spy Camera Robot well-structured literature review is characterized by a logical flow of ideas; current and relevant references with consistent, appropriate referencing style and the previous research on the topic. The project report that we want to be produced needed a few factor that should be taken consideration until that project implemented. To get an excellent project result, we need to study about the type of material, design, components that we used, flowchart, installation method and maintenance, and project size and so on that we need make it and consider the result that we get excellent.

## **2.0 Concept and theories of existing models**

The main concept of this project is get a protection for children with under controlled baby sitter. Mini Spy Camera Robot has the capacity to monitor an area in all directions continuously as a toy car's children. So, it will be useful them and we can prevent this baby sitter caring problem. This project for used as a spying things and it as be a human eyes in difficult situation.

### **2.1 General description of the existing system (problems, weaknesses)**

#### **PROBLEMS**

- i. People might may use sometimes lead to violation of people's privacy as sometimes people use it with bad intentions and filthy thoughts in their mind.
- ii. It is illegal to use this Mini Spy Camera Robot at the work place unless it is well informed to the employees.
- iii. In addition, this project might be used in areas such as dressing rooms, hotel rooms and privacy places.

#### **WEAKNESS**

- i. Our project will design a type of a toy, so children will use as a toy. It might be broken.
- ii. Our project is a privacy thing to use but some people with bad intentions will misused.

## 2.2 Full system block diagram

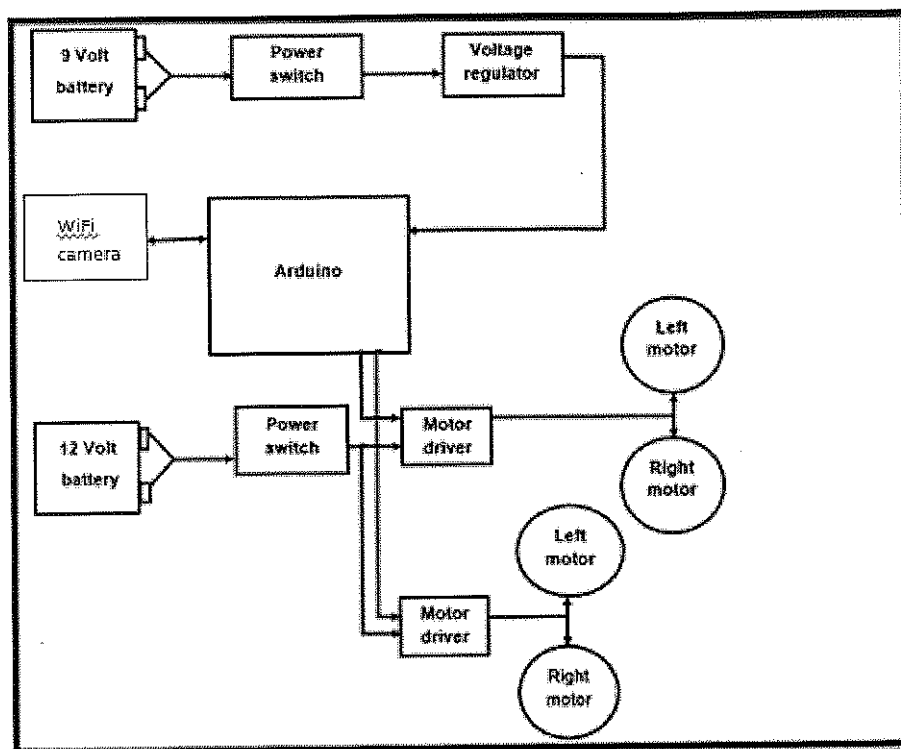
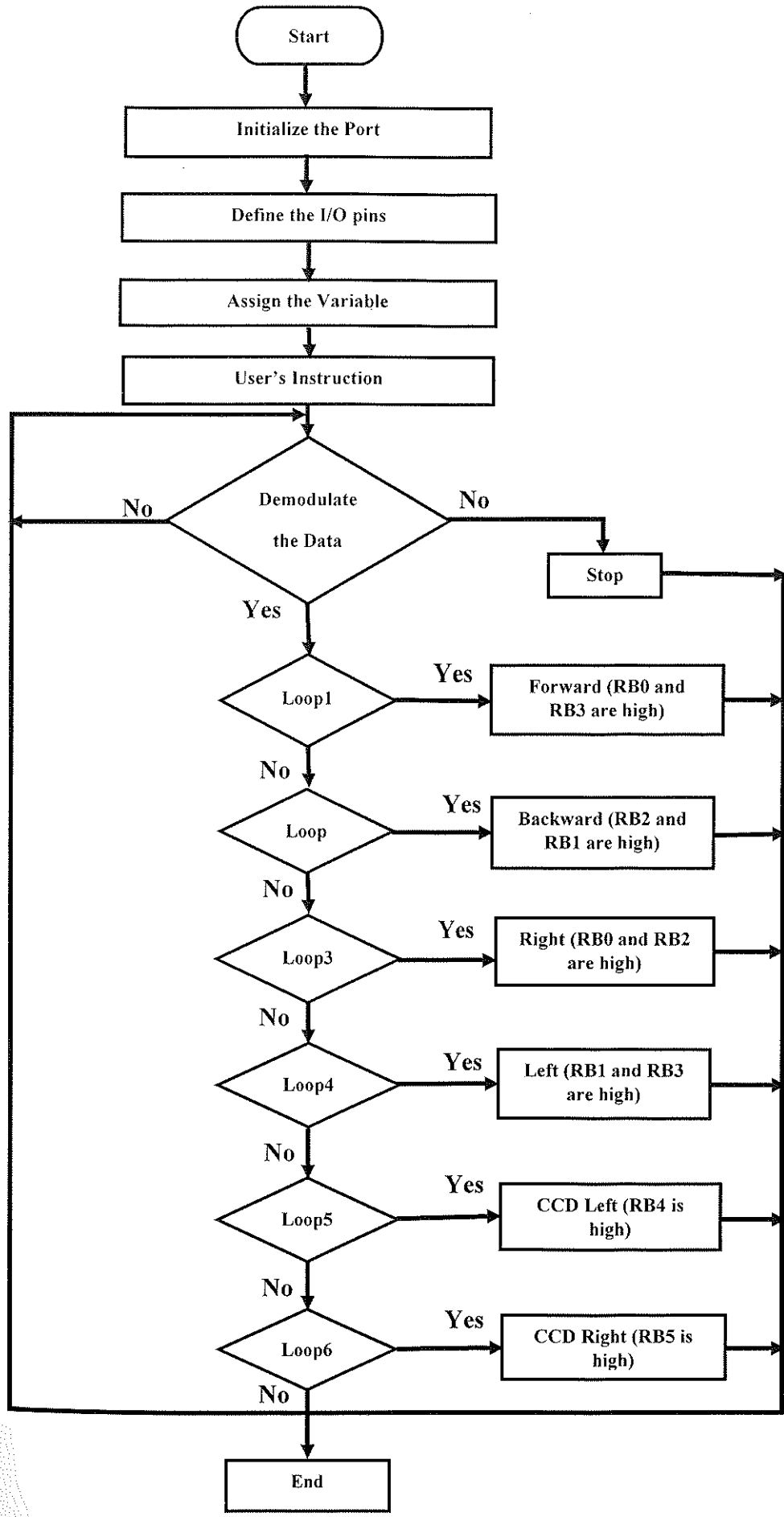


Figure 2.2: Full system block diagram

This system controlled by Bluetooth connection.it will control the whole instruction on this system.in addition, mobile operated Mini Spy Camera Robot, which consists of a transmitting mobile unit, motor driver, Arduino UNO. Besides that, we are using a wireless Wi-Fi camera (wireless fidelity). Moreover, this Wi-Fi Camera can move left and right direction to see survey around the robot. There is no USB [port in this camera s that saving and record process of the project need capture card.

### 2.3 Flow Chart of Project



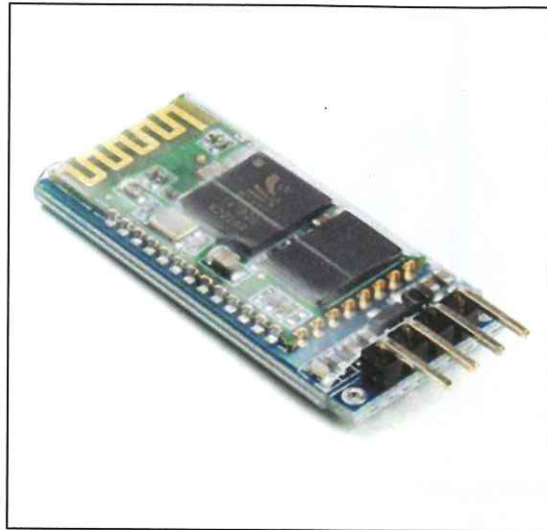
## 2.4 Component of projects

This is the proposed for Mini Spy Camera Robot of material as on planned.

COMPONENT OF MINI SPY CAMERA ROBOT	
DESCRIPTION	QUANTITY
<b>BOARD 1</b>	
BLUETOOTH DEVICE	1
SWITCH	1
Wi-Fi CAMERA	1
ARDUINO	1
CAPACITOR	1
BATTERY (9 V)	1
DC MOTOR	4

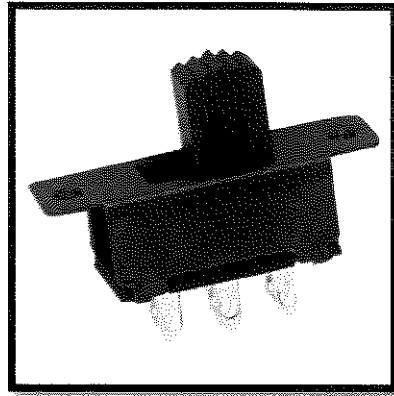
Table 2.4

#### 2.4.0 BLUETOOTH DEVICES



Bluetooth is defined as being a short-range radio technology (or wireless technology) aimed at simplifying communications among Internet devices and between devices and the Internet. It also aims to simplify data synchronization between Internet devices and other computers.

## 2.4.1 SWITCH

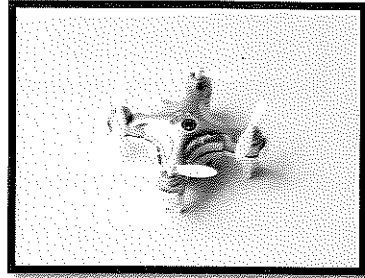


Adding another pole to the SPDT creates a double-pole, double-throw (DPDT) switch. Basically two SPDT switches, which can control two separate circuits, but are always switched together by a single actuator. DPDTs should have six terminals. A DPDT circuit symbol, and a 6-terminal DPDT rocker switch.

SPST stands for single pole single throw and DPDT stands for double pole double throw. A SPST switch is a simple on/off type switch and can be used for coil splitting and as a kill switch for the guitar. DPDT switches typically have a total of 6 terminals.

DPDT stands for double pole double throw relay. Relay is an electromagnetic device used to separate two circuits electrically and connect them magnetically. They are often used to interface an electronic circuit, which works at a low voltage to an electrical circuit which works at a high voltage.

#### 2.4.2 Wi-Fi CAMERA



A hidden camera or spy camera or security camera is a still or video camera used to record people without their knowledge. The camera is "hidden" because it is either not visible to the subject being filmed, or is disguised as another object. Hidden cameras can be built into commonly used objects such as television sets, smoke detectors, clock radios, motion detectors, ball caps, plants, and mobile phones. Hidden cameras may be used for household surveillance and may also be used commercially or industrially as security cameras. The proliferation and lower costs of video recording devices has led to an increase in the use of hidden cameras for legitimate surveillance need, as well as for entertainment and other purposes.

The use of hidden cameras raises personal privacy issues and there may be legal aspects to consider, depending on the jurisdiction in which use takes place. A hidden camera can be contrasted with CCTV, which is visible and which sometimes is accompanied with a warning notice of its presence.



### 2.4.3 ARDUINO



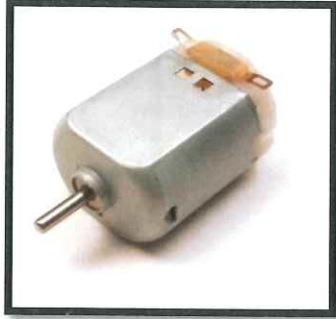
Arduino Uno is a microcontroller board based on the AT mega 328P. It has 14 digital input/output pins, of which 6 can be used as PWM outputs, 6 analogue inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

### 2.4.4 BATTERY [9V]



A **9-volt alkaline battery** — the kind used in portable radios is rated at 1 ampere-hour, which means this **battery** can continuously supply one ampere of current for 1 hour before it reaches the voltage threshold and is considered depleted.

#### 2.4.5 DC MOTOR

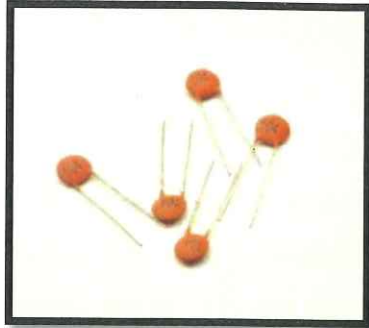


A **DC motor** is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields.

The field of DC motors can be:

- i. Permanent magnet (Permanent magnet stator),
- ii. Electromagnets connected in series (Wound stator),
- iii. Shunt (Wound stator), or.
- iv. Compound (Wound stator).

#### 2.4.6 CAPACITOR (50V 100nF 0.1uF 104Pf)



Its **function** is to store the electrical energy and give this energy again to the circuit when necessary. In other words, it charges and discharges the electric charge stored in it. Besides this, the **functions** of a **capacitor** are as follows: It blocks the flow of DC and permits the flow of AC

Power conditioning. Reservoir **capacitors** are **used** in power supplies where they smooth the output of a full or half wave rectifier. They can also be **used** in charge pump circuits as the energy storage element in the generation of higher voltages than the input voltage.

## CHAPTER 3

### METHODOLOGY

This chapter is discussed about the methodology that has been used to complete this project. It was planned properly by getting the correct information from various sources from references book, journal, articles, internet and others. It also include interview session with our supervisor to get the information, advices and guidelines to complete this proposal report. All of the data and useful information were determined to analyze to get the best result.

#### **3.0 Introduction**

I would like to introduce new functionalities. In our project the Wi-Fi camera will come with a receiver which connect to your phone or laptop for viewing. Furthermore, you can also connect the receiver to your VCR or to a DVR for recording. Minimum 100 meters transmission distance without block. The wireless camera can be able to upgrade with the 360 degree left and right directions by using Arduino program. So it is having movement at many sides. Moreover, this Wi-Fi camera can upgrade to move up and down directions. In addition, DC motors which driver the Wi-Fi camera, stepper motors can also be used.

### 3.1 Step Preparation Projects

Here is the sequence of process that need to be follow all the step to make the projects

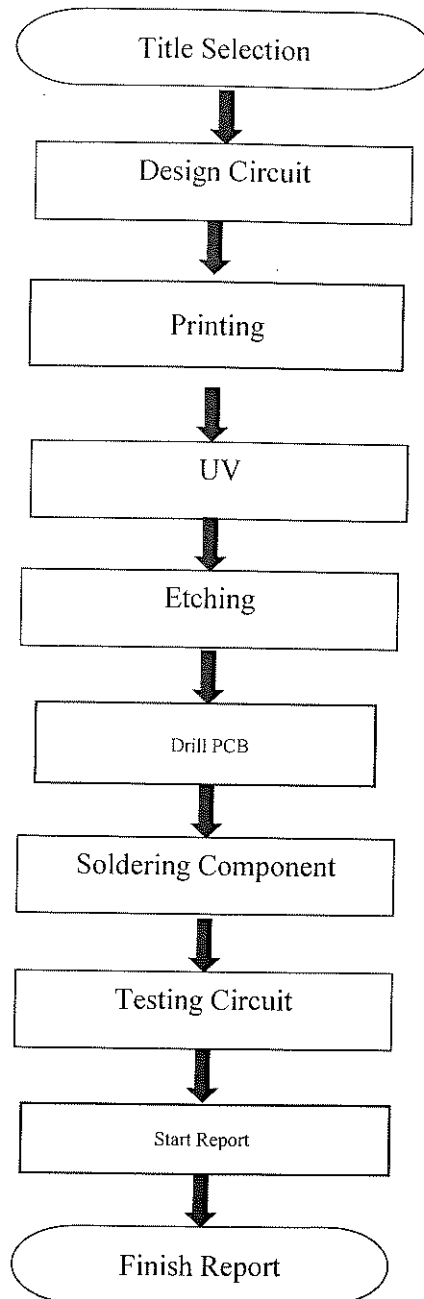


Figure 3.1: Step preparation projects

### 3.2 Development Of coding process

Software to write code is Arduino which has written in C language. Below is the code to for this system:

```
int ENA1 = 10;
int IN1 = 3;
int IN2 = 7;
int ENA2 = 11;
int IN3 = 8;
int IN4 = 9;

int state;
int flag=0;
int stateStop=0;
void setup() {

    pinMode(ENA1, OUTPUT);
    pinMode(IN1, OUTPUT);
    pinMode(IN2, OUTPUT);
    pinMode(ENA2, OUTPUT);
    pinMode(IN3, OUTPUT);
    pinMode(IN4, OUTPUT);
    digitalWrite(ENA1, HIGH);
    digitalWrite(ENA2, HIGH);
    Serial.begin(9600);
}
void loop() {
    if(Serial.available() > 0){
```

```
state = Serial.read();
flag=0;
}
if (state == '6') {

    digitalWrite(IN1, HIGH);
    digitalWrite(IN2, LOW);
    digitalWrite(IN3, LOW);
    digitalWrite(IN4, HIGH);
    if(flag == 0){
        Serial.println("Go Forward!");
        flag=1;
    }
}
else if (state == '5') {

    digitalWrite(IN1, LOW);
    digitalWrite(IN2, LOW);
    digitalWrite(IN3, LOW);
    digitalWrite(IN4, HIGH);
    if(flag == 0){
        Serial.println("Turn LEFT");
        flag=1;
    }
}
else if (state == '4') {

    digitalWrite(IN1, LOW);
    digitalWrite(IN2, LOW);
    digitalWrite(IN3, LOW);
    digitalWrite(IN4, LOW);
```

```
if(flag == 0){
  Serial.println("STOP!");
  flag=1;
}
stateStop=0;
}
else if (state == '3') {

  digitalWrite(IN1, HIGH);
  digitalWrite(IN2, LOW);
  digitalWrite(IN3, LOW);
  digitalWrite(IN4, LOW);
  if(flag == 0){
    Serial.println("Turn RIGHT");
    flag=1;
  }
}
else if (state == '2') {

  digitalWrite(IN1, LOW);
  digitalWrite(IN2, HIGH);
  digitalWrite(IN3, HIGH);
  digitalWrite(IN4, LOW);
  if(flag == 0){
    Serial.println("Reverse!");
    flag=1;
  }
  stateStop=0;
}
}
```



### 3.3 Software Requirements

The software requirements are description of features and functionalities of the target system. Requirements convey the expectations of users from the software product. The requirements can be obvious or hidden, known or unknown, expected or unexpected from client's point of view.

#### 3.3.0 Arduino Software IDE



Figure 3.3.0: Arduino

Programs written using Arduino Software (IDE) are called sketches. These sketches are written in the text editor and are saved with the file extension `.ino`. The editor has features for cutting/pasting and for searching/replacing text. The message area gives feedback while saving and exporting and also displays errors. The console displays text output by the Arduino Software (IDE), including complete error messages and other information. The bottom righthand corner of the window displays the configured board and serial port. The toolbar buttons allow you to verify and upload programs, create, open, and save sketches, and open the serial monitor.