

LED PIANO STAIRCASE

MUHAMMAD IZZAT SYAKIR BIN MOHD ZAILANI
MOHD SAIFUL AMIRUDIN BIN KHALID

A project report submitted to the Faculty of Electrical Engineering,
Universiti Teknologi MARA in partial fulfillment of the requirements for the award
of Diploma of Electrical Engineering.

FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
MALAYSIA

SEPTEMBER 2015

ACKNOWLEDGEMENT

Firstly, for our project we would like to thank to our lecturers especially our supervisor, Dr. Zakiah binti Mohd Yusoff for her guidance and encouragement. We also would like to thank to our all family members for their financial and spiritual support. On the other hand, we want to thank to our fellow friends for their kindness in supporting us to complete this report.

Lastly, we would like to thank all whose direct and indirect support that help us all this while to complete this project. May Allah bless all of you.

ABSTRACT

For the Ultrasonic Motion Sensor is very important in this project. Basically, the sensor has 4 legs which are trig leg, echo leg, 5v leg and ground leg. All the legs are connected at arduino but different pins. Ultrasonic Motion Sensor is set only to detect the movement of users each step of the stairs which means every step is detected by different ultrasonic motion sensor. The ultrasonic motion sensor's range is set by the program that created by users. If there are people step on the stair, the sensor will detect the movement and it send the information to arduino and the coding is running. After that, the arduino is working to run the process which is give the information to the LED and Piezoelectric Buzzer as both components producing the outputs. For each step of the stairs, one LED will light up and one buzzer will produce the piano key. Each stairs also have different piano key that have been set through the arduino coding. So the musical like piano will play in code what it has been set off. The function of led for the people walk into the night so the led will light up and also the speaker will produce the sound of the piano.

TABLE OF CONTENT

TITLE	PAGE
CANDIDATE DECLARATION	ii
SUPERVISOR'S APPROVAL	iii
DECLARATION OF ORIGINAL WORK	iv
ACKNOWLEDGEMENT	v
ABSTRACT	vi
TABLE OF CONTENT	vii
LIST OF FIGURE	x
LIST OF TABLE	xi
CHAPTER 1: INTRODUCTION	
1.1 Background of study	1
1.2 Problem Statement	2
1.3 Objectives	3
1.4 Scope of Project	4

1.5 Project Contribution	5
CHAPTER 2: LITERATURE REVIEW	
2.1 Introduction	6
2.2 History of Piano Staircase	6
2.3 Existing works on LED Piano Staircase	7
2.3.1 Arduino Mega as the Microcontroller	7
2.3.2 Ultrasonic Sensor as the Sensor	10
2.3.3 Piezoelectric Buzzer	12
2.3.4 IR LED	13
CHAPTER 3: METHODOLOGY	
3.1 Methodology	16
3.1.1 Literature Study	17
3.1.2 Identify Suitable Circuit	17
3.1.3 Design the Circuit Simulation	18
3.1.4 Hardware Development	19
3.1.5 Coding Development	23
3.1.6 Design the Prototype	25
3.1.7 Process of Troubleshooting	29
CHAPTER 4: RESULT AND DISCUSSION	
4.1 Circuit Simulation Result	31
4.2 Arduino Coding Result	32
4.3 Hardware Implementation Result	39