





CHALAKKODE P.O., KOROM, PAYYANUR, KANNUR-670 307

# LIST OF BTECH PROJECTS AND SAMPLE REPORT







CHALAKKODE P.O., KOROM, PAYYANUR, KANNUR-670 307

# LIST OF BTECH PROJECTS



# Sree Narayana Guru College of Engineering & Technology

CHALAKKODE P.O., KOROM, PAYYANUR, KANNUR-670 307



ΦF

# LIST OF PROJECT

Department	List of Projects	Name of the Guide	Name of the Students
	Application Of Cold Plasma In	Ms Archana C P	Anusha Jyothi
EEE	Water Purification System		Devikeerthana T P
	Street Light Monitoring And	Mr. Vaishakh M	Vaishnav T V
	Accident Detection Using Iot	Nayanar	Vishal K
	Fabrication Of Rubber Crump In	Mr. Divyathej M	Jasin P
	Polymer Composite Material		Nithin A
			Sandesh K Dinesh
	Floating Waste Collecting	Mr. Athul Raj P P	Adwaith Balan
	κουοι		Anuragh A
			Farhan C
	Hybrid Vehicle By Using Non Conventional Energy Sources	Mr. Jishnu Vn	Sreehari S Nambiar
			Aswanth C
ME			Mridul C
	Hillhold Assist On Manual	Mr. Sudhin	Adarsh Pk
	Transmission Vehicles	Chandran	Athul B
			Mohammed Aafil Ismayil Mk
	Automatic Solar Charging		Arsh Ibrahim
		Mr. Jacob Thomas	Mohammed Ramadan
ECE	Automatic Fish And Plant	Ms. Meera M	Arjun Ashok.K
			Jithin Sasidharan.N.V
			Keerthana.C.V
			Mariyambi
			Sanishma Sachithanand
	Soil stabilisation with Bamboo	Ms. Saritha	Sreehari K K
dia 1	Fibre and Human Hair Fibre	Sasindran	Nikhil Sai Dr. LEENA A V PRINCIPAL
			Ananjagaee NARAYANA GURU COLLEG

	Environmental impact Assessment of K Rail	Ms. Revathi.P	Anandhu Ashok Aswitha Gangadharan Abhiramy Rai
CE	Mobility Plan : Planning and Design in Kannur District	Ms. B. Mary Sonia George	Prayag Prabhakaran Athira Arun K Silna M
	Foamed concrete using egg shell powder and saw dust	Ms.Shilpa Valsakumar	Sachin Surendran Anjana C Ashaya Ramesh
	Experimental study on the use of Alkofine and Recycled Aggregate	Ms.Shamya Sukumaran	Ayshath Saifa Shamshad Muhamad Hannan
	Study on Copper Slag in Concrete Blocks	Mr.Shibin B	Sham Krishna prasad Pranav A K Akash P V
	Identification and Analysis of accident Blackspots using GIS	Dr.Susan Abraham	Adithya Krishna Anjali MP Muhamadh Rufaid
CSE	E - Kunhimangalam	Mr. Sunder V	Abhijith Adarsh K Jijo Jaison Jeeva Narayanan
	Fisherman safety using IoT and RF signal.	Ms. Nimisha MK	Avantika K Kavya Devi MK Sreehari V
	LORA : Locus Result Analyzer	Ms. Vijina Vijayan	Aathish P Jagadeesh Parvathi K Smijith M Varun
	Wooden Envisions	Ms. Thulasibai A	Archana Chithran K Sreenandhana TV Sreenisha KP Thanya Mohan
	Machine learning based for offtype plant identification in crop	Ms. Haritha MV	Amar Rajendran Muhammad Jishan PTK Dr. LEENA A V Sravan R PRINCIPAL SREE NARAYANA GURU COLL Muhammed ZERING& PECHNOL

Domestic gas level detection and automatic booking using IoTMs. Varsha MVishnu Prabhakaran Vishnu REarly detection of Alzheimer's disease using machine learning and deep learningMr. Sunder VMishab CP Pallavi Swaroop Kumar Sidharth K U.V. VaishnavMedlist the token booking applicationMs. Veena KKFathimathu Sahala Beevi Nipun S Anand Safa Fathima Safa Sayeed VAutomatic plant watering system using Arduino Uno and node MCUMs. Nimisha MKAlthaf Manila Mahesh Megha PKFurniture FitMs. Varsha MAnagha K Anagha M Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Anritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan				Abhinav AP
automatic booking using IoTVishnu REarly detection of Alzheimer's disease using machine learning and deep learningMr. Sunder VMishab CP Pallavi Swaroop Kumar Sidharth K U.V. VaishnavMedlist the token booking applicationMs. Veena KKFathimathu Sahala Beevi Nipun S Anand Safa Fathima Safa Sayeed VAutomatic plant watering system using Arduino Uno and node MCUMs. Nimisha MKAlthaf Manila Mahesh Megha PKFurniture FitMs. Narsha MAnagha K Anagha M Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbbijith Adarsh K Jijo Jaison Jeeva Narayanan	Domestic gas level detection and		Ms. Varsha M	Vishnu Prabhakaran
Early detection of Alzheimer's disease using machine learning and deep learningMis. Sunder VMishab CP Pallavi Swaroop Kumar Sidharth K U.V. VaishnavMedlist the token booking applicationMs. Veena KKFathimathu Sahala BeeviMedlist the token booking applicationMs. Veena KKNipun S Anand Safa Fathima Safa Sayeed VAutomatic plant watering system using Arduino Uno and node MCUMs. Nimisha MKAlthaf Manila Mahesh Megha PKFurniture FitMs. Varsha MAnagha K Anagha M Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan		automatic booking using loT		Vishnu R
Early detection of Alzheimer's disease using machine learning and deep learningMr. Sunder VPallavi Swaroop Kumar Sidharth K U.V. VaishnavMedlist the token booking applicationMr. Sunder VFathimathu Sahala Beevi Nipun S Anand Safa Fathima Safa Sayeed VMutomatic plant watering system using Arduino Uno and node MCUMs. Veena KKAlthaf Manila Mahesh Megha PKFurniture FitMs. Nimisha MKManila Mahesh Megha PKFurniture FitMs. Varsha MAnagha K Anagha M Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan			Mr. Sunder V	Mishab CP
disease using machine learning and deep learningMr. Sunder V Sidharth K U.V. VaishnavMedlist the token booking applicationMs. Veena KKSidharth K U.V. VaishnavMedlist the token booking applicationMs. Veena KKFathimathu Sahala BeeviMuster VMs. Veena KKSafa Fathima Safa Sayeed VAutomatic plant watering system using Arduino Uno and nodeMs. Nimisha MKAlthafMcUMs. Nimisha MKManila Mahesh Megha PKFurniture FitMs. Varsha MAnagha K Anagha K Anagha M Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan		Early detection of Alzheimer's		Pallavi Swaroop Kumar
and deep learningU.V. VaishnavMedlist the token booking applicationMs. Veena KKFathimathu Sahala BeeviMigun S Anand Safa Fathima Safa Sayeed VNipun S Anand Safa Sayeed VAutomatic plant watering system using Arduino Uno and nodeAlthafMCUMs. Nimisha MKManila Mahesh Megha PKMCUMs. Nimisha MKManila Mahesh Megha PKFurniture FitMs. Varsha MAnagha K Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan		disease using machine learning		Sidharth K
Medlist the topicationbooking ms. Veena KKFathimathu Sahala Beevi Nipun S Anand Safa Fathima Safa Sayeed VAutomatic plant watering system using Arduino Uno and node MCUMs. Nimisha MKAlthafMcUMs. Nimisha MKManila Mahesh Megha PKFurniture FitMs. Varsha MAnagha K Anagha M Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan		and deep learning		U.V. Vaishnav
Medlist applicationtoken booking applicationMs. Veena KKNipun S Anand Safa Fathima Safa Sayeed VAutomatic plant watering system using Arduino Uno and node MCUMs. Nimisha MKAlthafMcUMs. Nimisha MKManila Mahesh Megha PKFurniture FitMs. Varsha MAnagha K Anagha M Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan			Ms. Veena KK	Fathimathu Sahala Beevi
applicationMs. Veena KKSafa Fathima Safa Sayeed VAutomatic plant watering system using Arduino Uno and nodeMs. Nimisha MKAlthafMCUMs. Nimisha MKManila Mahesh Megha PKFurniture FitMs. Varsha MAnagha K Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan		Medlist the token booking		Nipun S Anand
Image: system using Arduino Uno and node MCUSafa Sayeed VAutomatic plant watering system using Arduino Uno and node MCUAlthafMCUManila MaheshMCUMagha PKFurniture FitMs. Varsha MFurniture FitMs. Varsha MMs. Varsha MAnagha KAnagha MHridyasree ValsanRamritha RajeevanMs. Vijina VijayanBuilding collapse alert using IoTMs. Vijina VijayanDream homeMs. Vijina VijayanAfmed AdilHryshika PradeepMs. Vijina VijayanAfmalAmritha Rajeevan MThanmaya SanjeevTheja RajeshAbilijithAdarsh KJijo JaisonJeeva Narayanan		application		Safa Fathima
Automatic plant watering system using Arduino Uno and nodeMs. Nimisha MKAlthafMCUMs. Nimisha MKManila Mahesh Megha PKFurniture FitMs. Varsha MAnagha K Anagha M Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan		+		Safa Sayeed V
using Arduino Uno and node MCUMs. Nimisha MKManila Mahesh Megha PKFurniture FitMs. Varsha MAnagha K Anagha M Hridyasree Valsan Ramritha RajeevanFurniture FitMs. Varsha MHridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan		Automatic plant watering system		Althaf
MCUMegha PKFurniture FitAnagha KAnagha MAnagha MHridyasree ValsanRamritha RajeevanRamritha RajeevanAhmed AdilHryshika PradeepMuhammed Rishal IkbalBuilding collapse alert using IoTMs. Vijina VijayanBuilding collapse alert using IoTMs. Vijina VijayanDream homeMs. Vijina VijayanLAjmalAmritha Rajeevan MAnmada Rajeevan MThanmaya SanjeevTheja RajeshLMr. Sunder VJijo JaisonJijo JaisonJeeva NarayananJina Jaison		using Arduino Uno and node	Ms. Nimisha MK	Manila Mahesh
Furniture FitMs. Varsha MAnagha K Anagha M Hridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan		MCU		Megha PK
Furniture FitMs. Varsha MAnagha M Hridyasree Valsan Ramritha RajeevanRamritha RajeevanRamritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan		-	Ms. Varsha M	Anagha K
Furniture FitMs. Varsha MHridyasree Valsan Ramritha RajeevanBuilding collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAdarsh K Jijo Jaison Jeeva Narayanan		E		Anagha M
Image: state in the state in		Furniture Fit		Hridyasree Valsan
Building collapse alert using IoTMs. Vijina VijayanAhmed Adil Hryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan				Ramritha Rajeevan
Building collapse alert using IoTMs. Vijina VijayanHryshika Pradeep Muhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan			Ms. Vijina Vijayan	Ahmed Adil
Building collapse alert using IoTIvis. Vijina VijayanMuhammed Rishal Ikbal VK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAdarsh K Jijo Jaison Jeeva Narayanan				Hryshika Pradeep
Building collapse alert using forVK AyshaDream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan		Duilding colleges clost using IoT		Muhammed Rishal Ikbal
Dream homeMs. Vijina VijayanAjmal Amritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan	Building collapse alert using to I			VK Aysha
Dream homeMs. Vijina VijayanAmritha Rajeevan M Thanmaya Sanjeev Theja RajeshE - KunhimangalamMr. Sunder VAbhijith Adarsh K Jijo Jaison Jeeva Narayanan				Ajmal
Dream nome       INIS. Vijina Vijayan       Thanmaya Sanjeev         Theja Rajesh       Theja Rajesh         E - Kunhimangalam       Mr. Sunder V       Adarsh K         Jijo Jaison       Jeeva Narayanan		Dreem home	Ma Million Millower	Amritha Rajeevan M
E - KunhimangalamMr. Sunder VAbhijithAdarsh KJijo JaisonJeeva Narayanan	Dream home		Ms. Vijina Vijayan	Thanmaya Sanjeev
E - Kunhimangalam Mr. Sunder V Abhijith Adarsh K Jijo Jaison Jeeva Narayanan				Theja Rajesh
E - Kunhimangalam Mr. Sunder V Adarsh K Jijo Jaison Jeeva Narayanan				Abhijith
Jijo Jaison Jeeva Narayanan	E - Kunhimangalam		Mr. Sunder V	Adarsh K
Jeeva Narayanan				Jijo Jaison
				Jeeva Narayanan

Ken

Dr. LEENA A V PRINCIPAL SREE NARAYANA GURU COLLEGE OF ENGINEERING & TECHNOLOGY PAYYANUR, KANNUR







CHALAKKODE P.O., KOROM, PAYYANUR, KANNUR-670 307

# **BTECH PROJECTS SAMPLE REPORT**

#### **PROJECT REPORT**

#### ON

# STREET LIGHT MONITORING AND ACCIDENT DETECTION USING IoT

# Submitted in partial fulfillment for the award of the degree of BACHELOR OF TECHNOLOGY

IN

### ELECTRICAL AND ELECTRONICS ENGINEERING

BY

#### VAISHNAV T V (SNC19EE003), VISHAL K (SNC19EE004),



# DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SREE NARAYANA GURU COLLEGE OF ENGINEERING

(Affiliated to Kerala Technological University and approved by AICTE New Delhi)

SREE NARAYANA GURU COLLEGE OF ENGINEERING & TECHNOLOGY, PAYYANUR KANNUR

Chalakode P.O., Payyanur,

Kannur, Kerala, India, 670307

HODEEL

# DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

# SREE NARAYANA GURU COLLEGE OF ENGINEERING



#### CERTIFICATE

This is to certify that the report entitled "STREET LIGHT MONITORING AND ACCIDENT DETECTION USING IoT" is a bonafide record of the project submitted by VAISHNAV.T.V (SNC19EE003) and VISHAL.K (SNC19EE004) in partial fulfillment of the requirements for the award of Degree of Bachelor of Technology in Electrical and Electronics Engineering of the APJ ABDUL KALAM TECHNOLOGICAL University.

Internal Guide Mr.VAISHAKH.M.NAYANAR Asst. Professor Dept of EEE SNGCET, Payyanur

Project Co-ordinator Mr.MANU.C Asst. Professor Dept of EEE SNGCET, Payyanur

DR-LEENA A. V. PRINCIPAL SREE NARAYANA GURU COLLEGE OF ENGINEERING & TECHNOLOGY, PAYYANUR KANNUR

External Supervisor SVJITH . D.K AP, EEF CETKR CHEEMENI

thelass

Head of the Department Mr.ABHILASH KRISHNAN.T.K Asst. Professor Dept of EEE SNGCET, Payyamur

#### ACKNOWLEDGEMENT

At the outset, I think the lord almighty for the grace, strength and hope to make my endeavor a success. I express my deep felt gratitude to **Dr. LEENA.A.V**, SREE NARAYANA GURU COLLEGE OF ENGINEERING AND TECHNOLOGY, PAYYANUR for providing the necessary facilities.

I extend my sincere gratitude towards **Prof. ABHILASH KRISHNAN.T.K**, Head of Department, Electrical and Electronics Engineering for giving us his valuable knowledge and wonderful technical guidance.

I am profoundly grateful to Mr.VAISHAKH.M.NAYANAR and for their valuable guidance, support, suggestions and encouragement.

Furthermore, I would like to thank all others, especially my parents and numerous friends. This project would not have been a success without the inspiration, valuable suggestions and moral support from them throughout the course.

Place: Payyanur Date: JUNE 2023

Dr. LEENA A. V. PRINCIPAL SREE NARAYANA GURU COLLEGE OF ENGINEERING & TECHNOLOGY, PAYYANUR KANNUR

HODEEE

#### **ABSTRACT**

Automatic Street Light Control System is a simple yet powerful concept, which uses transistor as a switch. By using this system manual works are 100% removed. It automatically switches ON lights when the sunlight goes below the visible region of our eyes. This is done by a sensor called Light Dependant Resistor (LDR) which senses the light actually like our eyes. It automatically switches OFF lights whenever the sunlight comes, visible to our eyes. In this project, no need of manual operation like ON time and OFF time setting. An efficient vehicle tracking system is designed and implemented for tracking the movement of any equipped vehicle from any location at any time. The proposed system made good use of a popular technology that combines a Smartphone application with Node MCU. This will be easy to make and inexpensive compared to others. This project will help the accident detection and rescue operations quick and effective with the help of proper emergency communication systems.

Dr. LEENA A. V. PRINCIPAL SREE NARAYANA GURU COLLEGE OF ENGINEERING & TECHNOLOGY, PAYYANUR KANNUR

Man DEEE

# **CONTENTS**

ABSTRACT1
LIST OF FIGURES
ABBREVIATIONS
Chapter 1. INTRODUCTION
Chapter 2. LITERATURE REVIEW
Chapter 3. OBJECTIVES
Chapter 4. PROPOSED METHODOLOGY
Chapter 5. HARDWARE COMPONENTS
Chapter 6. SOFTWARE USED
Chapter 7. PROGRAM25
Chapter 8. PCB LAYOUT OF THE CIRCUIT
Chapter 9. FUTURE SCOPE
Chapter 10. CHALLENGES
Chapter 11. ADVANTAGES
Chapter 12. CONCLUSIONS
REFERENCES

Lun

Dr. LEENA A. V. PRINCIPAL SREE MARAYANA GURU COLLEGE OF ENGINEERING & TECHNOLOGY, PAYYANUR KANNUR

HOD EEE

# **LIST OF FIGURES**

4.1	BLOCK DIAGRAM	9
4.2	CIRCUIT DIAGRAM OF STREET LIGHT	10
4.3	CIRCUIT DIAGRAM ACCIDENT DETECTION	12
4.4	CIRCUIT DIAGRAM OF POWER SUPPLY	13
5.1	ESP8266 PIN DIAGRAM	14
5.2	ESP32	16
5.3	IR SENSOR	16
5.4	LDR SENSOR	. 17
5.5	BC547 TRANSISTOR	18
5.6	VOLATGE REGULATOR	18
5.7	12V RELAY	19
5.7	CAPACITOR	19
5.9	5V BUZZER	20
5.10	RESISTOR	20
5.11	LED	21
6.1	DIPTRACE SOFTWARE	22
6.2	ARDUINO SOFTWARE	23
6.3	ANDROID	24
8.1	PCB LAYOUT	30
8.2	PCBLAYOUT	30

Xeen

HODEEE

Dr. LEENA A. V. PRINCIPAL SREE NARAYANA GURU COLLEGE OF ENGINEERING & TECHNOLOGY, PAYYANUR KANNUR

# ABBREVIATIONS

ІоТ	Internet of Things
LDR	Light Dependent Resistor
IR	Infra Red
GPS	Global Positioning System
MCU	Micro-Controller Unit
LED	Light Emitting Diode
AC	Alternating Current
DC	Direct Current
GND	Ground
VCC	Voltage Common Collector
UART	Universal Asynchronous Reciever-Transmitter
PWM	Pulse Width Modulator
ADC	Analog to Digital Converter
GPIO	General Purpose Input/Output

Lun

Dr. LEENA A. V. PRINCIPAL SREE NARAYANA GURU COLLEGE OF ENGINEERING & TECHNOLOGY, PAYYANUR KANNUR

Abbillos Hop EEE

# Chapter 1 INTRODUCTION

Roads play an important role in our transportation system. Global status report of 2015 says that the total numbers of deaths caused due to road accidents are 1.25 million a year. Among this India faces the highest number of accidents and accident fatalities in the world. The major fatalities caused in the accidents were to the lack of a proper system for accident detection and rescue facilities. The proposed "Street Light Monitoring and Accident Detection using IoT" monitors the accident prone areas and provide proper communication with the authorities about the threat and hazards as well as provides energy saving automated street light. Street lights with automatic switching capability which reduces the need of human interference thereby providing sufficient light on roads when needed. It increases the working efficiency of street lights.

#### LITERATURE SURVEY

# "IoT-Based Smart Street Light Monitoring System with Kalman Filter Estimation"Edgardo Ricardo B. Sajonia;Lovely Mae Dagsa 2021 6th International Conference on Development in Renewable Energy Technology (ICDRET)

Integrating an intelligent control and management system on solar streetlights has an advanced impact in improving its system efficiency. The study developed a system for collecting, analyzing, and monitoring information on streetlight infrastructure in remote areas using IOT-based technology utilizing a Kalman filter estimation method. A solar street light controller is integrated into the conventional intelligent streetlight PV system using a plurality of Gravity I2C digital wattmeter, and LILYGO TTGO T-Call V1.5 that includes a real-time collection and logging of data. The study utilized open-source software such as PHP framework and MySQL database to display the battery and solar panel status online. The Kalman filter algorithm with modified initialization was used to estimate the bus voltage and load current. Data acquisition is in a one-minute interval based on the IEC61724 standard.

## "Design of intelligent light control system based on NB-IoT" Xiaoling Zeng; Jianping Zhang 2022 International Conference on Wearables, Sports and Lifestyle Management (WSLM)

At this stage, the level of urbanization in China is constantly improving, and the construction of "smart city" is gradually included in the ranks of national urban planning. As an important part of smart cities, intelligent street light are welcoming unprecedented development opportunities. The traditional street light control system generally adopts the methods of centralized line control, human inspection, and computer-side web monitoring. Aim at the lag of traditional street lamp management, and lack of real-time monitoring and remote control, this thesis designs a set of intelligent street light monitoring system based on NB-IoT (Narrow Band-Internet of Things). The system realizes the real-time control of street lighting system, environmental monitoring, spray cooling and dust suppression, etc. Cloud technology is used to calibrate the geographic location information and working status information of each street lamp.

"Vehicle Accident Detection and Prevention using IoT and Deep Learning"

Lakshmy S;Renjith Gopan;Meenakshi M L;Adithya V;Mariya R Elizabeth 2022 IEEE International Conference on Signal Processing, Informatics, Communication and Energy Systems (SPICES)

Road accidents have become an issue of major concern to the people. This paper presents an accident prevention mechanism developed through alcohol detection using an MQ3 alcohol sensor followed by automatic engine locking. The detection part uses an SW-420 vibration sensor to detect any sort of abnormal vibrations that may occur from a collision. This is accompanied by supervised deep learning CNN algorithms. The accident scene image is captured using a front camera built in the vehicle to be used by the deep learning model for accident prediction. Accident detection is followed by communication to the nearest emergency center using GPS and GSM modules

## "A Study on Cloud and IoT based Accident Detection & Prevention Systems"

Shaik Areef;T Yuvanth Sai;V. Sri Harsha;Gubbala Satya Sai Deepak;Amarendra K;Pachipala Yellamma

#### 2023 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS)

The world's population has recently surpassed 7 billion, and accidents are also growing day by day due to poor driving habits, excessive speed, and carelessness. In India, there were more than five lakhs traffic accidents in 2015, and 1.5 lakh fatalities were reported. By 2022, this number is anticipated to rise by 50% The deaths of the victims are increasing because of not getting emergency help at the hospital at the right time and not reaching the emergency vehicle at the right time to the accident spot. So, requires an urgent need to develop an IOT-based Accident detection model, which will help in reducing deaths. This study reviews the existing accident detection models and strategies to ascertain the best strategy to prevent traffic accidents and provide the best solution for locating the accident site and sending the information about the accidents as an alert message to the nearby hospital. This study mainly discusses about the accident detection and prevention system developed by using IOT.

"Smart Energy Efficient Home Automation System Using IoT" Satyendra K. Vishwakarma;Prashant Upadhyaya;Babita Kumari;Arun Kumar Mishra 2019 4th International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU)

Advancement in IoT based application has become the state-of-the art technology among the researcher due to the availability of Internet everywhere. To make the application more user friendly, web based and android based technologies have gained their importance in this cutting edge technology. In this paper, smart energy efficient home automation system is proposed that can access and control the home equipments from every corner of the world. For this system, Internet connectivity module is attached to the main supply unit of the home system which can be accessed through the Internet. For wireless connectivity, the static IP address is used. Home automation is based on multimodal application that can be operated using voice recognition command of the user using the Google Assistant or through a web based application. Thus, main objective of this work is to make home our automation system more secure and intelligent.

#### **OBJECTIVES**

The main objective of the system is to provide various protections, controls and monitoring of various road conditions by the control room and implement an energy saving and efficient street lighting system. The system also aim to implement an better and efficient for the response to accidents that occur in remote areas like forest roads and express way journeys. In the system the above goals are achieved through proper programming of Node MCU microcontroller and android system that is installed in the vehicle module. The node MCU send warning signals and accident alarms to the designated locations like hospitals or rescue centres in the case of a collision or other types if accidents. The proposed system Saves energy by increasing the intensity of the lights only when the system detects the movement of an object. The system increases the intensity of the streetlight ahead of the movement of an object and decreases the intensity of trailing lights simultaneously. The proposed system is easy to setup and implement and it doesn't require extra maintenance compared to the already traditional existing system which is already in us

#### PROPOSED METHODOLOGY



Fig.4.1 Block diagram

The block of fig.4.1 shows the hardware part of the model which consists of power supply, two microcontrollers, two IR sensors, two LDR sensors, tilt sensor, hit button, power supply, buzzer, Bluetooth module, android device, relays, LEDs, server and a telegram bot. The system consists of two sections-street light section and accident detection section. The street light section uses ESP32 Microcontroller. It consists of two LDR sensors and two IR sensors places on two streetlight poles respectively. It also consist of two relays which are connected to the two streetlights respectively. When the LDR detects the presence of light, the Streetlight automatically turns OFF and when the LRD do not detect light, the streetlight is turned ON with help of signals generated by the microcontroller. IR sensors placed on two streetlight poles respectively detects the passage vehicles. When the first IR detects a vehicles, it initiates a count by the microcontroller. This count stops when the second IR detects the vehicle. If the first IR is detected and the second IR do not detect any vehicle within the time of count, an alert signal is sent to the control room to observe the road.

The second section of the block diagram in the accident detection side which consist of hit button, tilt sensor, buzzer, Bluetooth module and android device. When an accident occurs, the tilt sensor and hit button are activated. When these two components gets activated at same time, a message is passed to the control room that an accident is detected through the server. The android device fetches the location of the collision spot and sends the location to the assigned contact number.



Fig.4.2 Circuit Diagram of Street light

The power supply circuit converts the 230V AC into 5V DC which is the power required for the operation of Node MCU. 5V DC is connected to the Vcc of the Node MCU. Hence the microcontroller gets the requires operating power. The IR Sensors are connected to the D21 and D19 pins of the Node MCU respectively. The ground terminal is properly grounded and the 5V DC supply is given to the Vcc pin of sensors. The two LDR sensors are connected to the D34 and D35 pins of the Node MCU. Power supply is given and ground is also provided for the LDRs. Pins D22 and D23 are LED indications. D18 and D5 pins are connected to the street lights through two transistors and relays respectively. Transistor acts as a switch. When the LDR sensors are LOW there is no presence of sunlight. Hence the Microcontroller send a signal for the transistor to open which creates a magnetic field in relay causing the deflection inside the relay completing the circuit of streetlight. Thus the street lights are turned ON.

When the LDR1 senses an element, the Node MCU starts a count. The count stops when the LDR2 is also sensed. If the LDR2 doesn't sense any object before the count stops, the microcontroller sends a message to the telegram bot.

The ESP32 development board has 25 GPIO pins that can be assigned different functions by programming the appropriate registers. There are several kinds of GPIOs: digital-only, analog-enabled, capacitive-touch-enabled, etc. Analog-enabled GPIOs and Capacitive-touch-enabled GPIOs can be configured as digital GPIOs. Most of these digital GPIOs can be configured with internal pull-up or pull-down, or set to high impedance.

Pins GPIO34, GPIO35, GPIO36(VP) and GPIO39(VN) cannot be configured as outputs. They can be used as digital or analog inputs, or for other purposes. They also lack internal pull-up and pull-down resistors, unlike the other GPIO pins. All GPIOs can be configured as interrupts.

ESP32 is one such microcontroller that can be used to start learning IOT and making IOT circuits. It is therefore important to learn about its pins layout and also what is the purpose of each pin and how it can be used. In this article, first, the layout of pins available in ESP32 Wroom 30-pin microcontroller is specified. Then the different types of pins that are available in ESP32 are described. ESP32 is used for a variety of applications including the use of wifi, transmitters, and receiver devices, Serial Peripheral Interfaces, analog and digital devices, and lots of sensors.



Fig.4.3. Circuit Diagram of Accident Detection

The GND pin of the ESP8266 is connected to the ground and the vcc is connected to the power supply. At a digital pin is connected to Hc-05 bluetooth module and tilt sensor. when hit button is pressed and tilt sensor is tilted high pulse is sent to ESP32 and the buzzer pin is high. When ESP32 has sensed accident it send an alert message to control room and with the help of an android app it send the location and an sms message to the number which is been uploaded from the android APP.2 led light are built in the board to understand the sensing and working of ESP32.

Buzzer is connected to the mcu through a thyristor and a resistor.when there is a power supply from mcu to the base of thyristor the collector and emmiter gets contaced and buzzer will get the power supply properly



Fig .4.4. Circuit Diagram Power Supply

The power supply section contains a step-down transformer for stepping down the AC 230V into 12V and is rectified using bridge rectifier and filtered using capacitor filtering method and given to PIC as itssource voltage, 5V DC. Power supply is a device or system that supplies electrical or other types of energy to an output load or group of loads. A simple AC powered linear power supply usually uses a transformer to convert the voltage from the wall outlet (mains) to a different, usually a lower voltage. If it is used to produce DC a rectifier circuit is employed either as a single chip, an array of diodes sometimes called a diode bridge or Bridge Rectifier, both for full wave rectification or a single diode yielding a half wave (pulsating) output. More elaborate configurations rectify the AC voltage at first to pulsating DC. Then a capacitor smooth out part of the pulses giving a type of DC voltage. The smaller pulses remaining are known as ripple. Because of a full wave rectification they occur at twice the mains frequency. Finally depending on the requirements of the load, a linear regulator may be used to reduce the ripple sometimes also allowing for adjustment of the output to thedesired but lower voltage.

#### HARDWARE COMPONENTS

#### **ESP8266**

The ESP8266 chip incorporates on a standard circuit board. The board has a built-in USB port

that is already fixed with wired up in the chip. The hardware reset button, Wi-Fi antenna, LED lights, and standard-sized GPIO (General Purpose Input Output) pins that can plug into a bread board. It has Processor called L106 32bit RISC microprocessor core based on the Ten silica Xtensa Diamond Standard 106Micro running at 80 MHz and has a memory of 32 Kbit instruction RAM ,32 Kbit instruction cache RAM, 80 Kbit user data RAM&16 Kbytes system data RAM. It has inbuilt Wi-Fi modules of (IEEE 802.11 b/g/n) Wi-Fi technology. The ESP8266 is the name of a micro controller designed by Expressive Systems. The ESP8266 itself is one of the self-contained Wi-Fi networking solutions that also offering as a bridge from presented micro controller to Wi-Fi and is also capable of organization self-contained applications. Node MCU is a lowcost open source IoT platform. It initially included firmware which runs on the ESP8266 Wi-Fi SoC from expressive Systems, and hardware which was based on the ESP-12 module. Later, support for the ESP32 32-bit MCU was added. ESP8266 is a wifi SOC (system on a chip) produced by expressive. It is a highly integrated chip designed to provide full internet connectivity in a small package.



Fig.5.1 ESP8266 pin diagram

- ESP32 is a series of low-cost, low-power system on a chip Power Pins There are four power pins. VIN pin and three 3.3V pins.
- VIN can be used to directly supply the NodeMCU/ESP8266 and its peripherals. Power delivered on VIN is regulated through the onboard regulator on the NodeMCU module – you can also supply 5V regulated to the VIN pin
- 3.3V pins are the output of the onboard voltage regulator and can be used to supply power to external components.
  - are the ground pins of NodeMCU/ESP8266
- NodeMCU/ESP8266 has 17 GPIO pins which can be assigned to functions such as I2C, I2S, UART, PWM, IR Remote Control, LED Light and Button programmatically. Each digital enabled GPIO can be configured to internal pull-up or pull-down, or set to high impedance. When configured as an input, it can also be set to edge-trigger or level-trigger to generate CPU interrupts.

14

- **ADC Otennel** the NodeMCU is embedded with a 10-bit precision SAR ADC. The two functions can be implemented using ADC. Testing power supply voltage of VDD3P3 pin and testing input voltage of TOUT pin. However, they cannot be implemented at the same time.
- **UART Pins** NodeMCU/ESP8266 has 2 UART interfaces (UART0 and UART1) which provide asynchronous communication (RS232 and RS485), and can communicate at up to 4.5 Mbps. UART0 (TXD0, RXD0, RST0 & CTS0 pins) can be used for communication. However, UART1 (TXD1 pin) features only data transmit signal so, it is usually used for printing log.
- **PWM Pins** The board has 4 channels of Pulse Width Modulation (PWM). The PWM output can be implemented programmatically and used for driving digital motors and LEDs. PWM frequency range is adjustable from 1000 µs to 10000 µs (100 Hz and 1 kHz).
- EN: The ESP8266 chip is enabled when EN pin is pulled HIGH. When pulled LOW the chip works at minimum power.

#### • ESP32

SP32 is a series of low-cost, low-power system on a chip microcontrollers with integrated Wi-Fi and dual-mode Bluetooth. The ESP32 series employs either a Tensilica Xtensa LX6 microprocessor in both dual-core and single-core variations, Xtensa LX7 dual-core microprocessor or a single-core RISC-V microprocessor and includes built-in antenna switches, RF balun, power amplifier, low-noise receive amplifier, filters, and power-management modules. ESP32 is created and developed by Espressif Systems, a Shanghai-based Chinese company, and is manufactured by TSMC using their 40 nm process.<sup>[2]</sup> It is a successor to the ESP8266 Microcontroller



Fig 5.2 ESP32

#### IR SENSOR

It An infrared (IR) sensor is an electronic device that measures and detects infrared radiation in its surrounding environment. Infrared radiation was accidentally discovered by an astronomer named William Herchel in 1800. While measuring the temperature of each color of light (separated by a prism), he noticed that the temperature just beyond the red light was highest. IR is invisible to the human eye, as its wavelength is longer than that of visible light (though it is still on the same electromagnetic spectrum). Anything that emits heat (everything that has a temperature above around five degrees Kelvin) gives off infrared radiation. There are two types of infrared sensors: active and passive. Active infrared sensors both emit and detect infrared radiation. Active IR sensors have two parts: a light emitting diode (LED) and a receiver. When an object comes close to the sensor, the infrared light from the LED reflects off of the object and is detected by the receiver. Active IR sensors act as proximity sensors, and they are commonly used in obstacle detection systems (such as in robots).



Fig.5.3 IR Sensor 16

#### LDR SENSOR

A photo resistor (also known as a photocell, or light-dependent resistor, LDR, or photo-conductive cell) is a passive component that decreases resistance with respect to receiving luminosity (light) on the component's sensitive surface. The resistance of a photo resistor decreases with increase in incident light intensity; in other words, it exhibits photoconductivity. A photo resistor can be applied in light-sensitive detector circuits and light-activated and dark-activated switching circuits acting as a resistance semiconductor. In the dark, a photo resistor can have a resistance as high as several mega ohms (M $\Omega$ ), while in the light, a photo resistor can have a resistance as low as a few hundred ohms. If incident light on a photo resistor exceeds a certain frequency, photons absorbed by the semiconductor give bound electrons enough energy to jump into the conduction band. The resulting free electrons (and their hole partners) conduct electricity, thereby lowering resistance. The resistance range and sensitivity of a photo resistor can substantially differ among dissimilar devices. Moreover, unique photo resistors may react substantially differently to photons within certain wavelength bands.

A photoelectric device can be either intrinsic or extrinsic. An intrinsic semiconductor has its own charge carriers and is not an efficient semiconductor (such as silicon is). In intrinsic devices, most of the available electrons are in the valence band, and hence the photon must have enough energy to excite the electron across the entire band gap. Extrinsic devices have impurities, also called do pants, added whose ground state energy is closer to the conduction band; since the electrons do not have as far to jump, lower energy photons (that is, longer wavelengths and lower frequencies) are sufficient to trigger the device. If a sample of silicon has some of its atoms replaced by phosphorus atoms (impurities), there will be extra electrons available for conduction. This is an example of an extrinsic semiconductor.



Fig 5.4 LDR Sensor

#### • BC547 TRANSISTOR

It The BC547 NPN bipolar junction transistor is top pick for low-power applications, such as illuminating LEDs, amplifying sensor signals, and inciting action in miniscule relays and motors. Its accessibility, affordability, and effortless integration into a plethora of circuit designs have secured its position as a staple in the electronics industry.



Fig.5.5 BC547

#### • VOLTAGE REGULATOR

Voltage regulator 7805 IC is one of the most widely used voltage regulator IC in different electrical and electronic circuits. It takes an unregulated voltage of 7 V to 35 V and produces a fixed regulated output voltage of 5 V DC



Fig.5.6. 7805 VOLTAGE REGULATOR

#### • 12V RELAY

Relay is an electromagnetic device which is used to isolate two circuits electrically and connect them magnetically. They are very useful devices and allow one circuit to switch another one while they are completely separate. They are often used to interface an electronic circuit (working at a low voltage) to an electrical circuit which works at very high voltage. For example, a relay can make a 5V DC battery circuit to switch a 230V AC mains circuit. Thus, a small sensor circuit can drive, say, a fan or an electric bulb.



Fig.5.7 12V RELAY

#### • 470mF CAPACITOR

Electrolytic capacitors are a type of capacitor widely used in electronic circuits due to their high capacitance values and relatively small size. They are commonly used for surge suppressing, transient voltages, and filtering out noise at the  $\sim$ 1KHz or less.



Fig.5.8. 470mF Capacitor

#### • 5V BUZZER

Piezo Buzzer 5V (Wire type) is a loud continues type Piezo Buzzer. It has two wires for connection and can work on 3 to 7 V DC. Just connect with power supply and it will give loud sound. The piezo buzzer produces sound based on reverse of the piezoelectric effect.



Fig.5.9. 5V Buzzer

#### • 470 ohm RESISTOR

A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.

1 14



Fig.5.10. 470 ohm RESISTOR

#### • LIGHT EMITTING DIODES (LED)

A Light-Emitting Diode (LED) Is A Semiconductor Light Source That Emits Light When Current Flows Through It. Electrons In The Semiconductor Recombine With Electron Holes, Releasing Energy In The Form Of Photons. This Effect Is Called Electroluminescence. The Colour Of The Light (Corresponding To The Energy Of The Photons) Is Determined By The Energy Required For Electrons To Cross The Band Gap Of The Semiconductor. White Light Is Obtained By Using Multiple Semiconductors Or A Layer Of Light-Emitting Phosphor On The Semiconductor Device.

LEDs are made in different packages for different applications. A single or a few LED junctions may be packed in one miniature device for use as an indicator or pilot lamp. An LED array may include controlling circuits within the same package, which may range from a simple resistor, blinking or color changing control, or an addressable controller for RGB devices. Higher-powered white-emitting devices will be mounted on heat sinks and will be used for illumination. Alphanumeric displays in dot matrix or bar formats are widely available. Special packages permit connection of LEDs to optical fibers for high-speed data communication links.

The light from LEDs can be modulated very quickly so they are used extensively in optical fiber and free space optics communications. This includes remote controls, such as for television sets, where infrared LEDs are used. Opto-isolators use with often an LED combined a photodiode or phototransistor to provide a signal path with electrical isolation between two circuits. This is especially useful in medical equipment where the signals from a low-voltage sensor circuit (usually battery-powered) in contact with a living organism must be electrically isolated from any possible electrical failure in a recording or monitoring device operating at potentially dangerous voltages. An optoisolator also lets information be transferred between circuits that do not share a common ground potential.

Fig.5.11. LED

#### SOFTWARE USED

#### **1.DIPTRACE SOFTWARE**



Fig.6.1.Diptrace Software

Diptrace Is EDA/CAD Software For Creating Schematic Diagrams And Printed Circuit Boards. The Developers Provide Multi-Lingual Interface And Tutorials (Currently Available In English And 21 Other Languages). Diptrace Has 4 Modules: Schematic Capture Editor, PCB Layout Editor With Built-In Shape-Based Auto-Router And 3D Preview& Export, Component Editor, And Pattern Editor.

Diptrace Is An Advanced PCB Design Software Application That Consists Of 4 Modules PCB Layout With Efficient Auto-Router And Auto-Placer, Schematic Capture, Component And Pattern Editors That Allow You To Design Your Own Component Libraries. Diptrace Has A Powerful Automatic Router, Superior To Many Routers Included In Other PCB Layout Packages. It Can Route A Single Layer And Multilayer Circuit Boards, And There Is An Option To Auto Route A Single Layer Board With Jumper Wires, If Required. Diptrace Also Provides You With External Auto Router Support. Smart Manual Routing Tools Allow Users To Finalize The Design And To Get The Results They Want In A Blink Of An Eye. There Are Number Of Verification Features, That Allows You To Control Accuracy Of Your Project. Diptrace Modules Allow You To Exchange Schematics, Layouts And Libraries With Other EDA And CAD Packages. Output Formats Are DXF, Gerber, Drill And G-Code. Standard Libraries Contain More Than 98,000 Components.

#### **Basic Features**

- Simple UI
- Multi-Sheet And Hierarchical Schematics
- High-Speed Shape-Based Auto router
- Smart Manual Routing Tools
- Differential Pairs
- Wide Import / Export Capabilities

- Advanced Verifications With Real-Time DRC
- Real-Time 3D PCB Preview & STEP Export

ODB++ And Gerber Manufacturing Outputs

#### **3. ARDUINO SOFTWARE**



Fig.6.2. Arduino Software

Arduino (/a:r'dwi:nou/) is an open-source hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices. Its hardware products are licensed under a CC BY-SA license, while the software is licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially from the official website or through authorized distributors. Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards ('shields') or breadboards (for prototyping) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs. The microcontrollers can be programmed using the C and C++ programming languages(Embedded C), using a standard API which is also known as the Arduino Programming Language, inspired by the Processing language and used with a modified version of the Processing IDE. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) and a command line tool developed in Go.

The Arduino project began in 2005 as a tool for students at the Interaction Design Institute Ivrea, Italy, aiming to provide a low-cost and easy way for novices and professionals to create devices that interact with their environment using sensors and actuators. Common examples of such devices intended for beginner hobbyists include simple robots, thermostats, and motion detectors.

The name *Arduino* comes from a bar in Ivrea, Italy, where some of the project's founders used to meet. The bar was named after Arduin of Ivrea, who was the margrave of the March of Ivrea and King of Italy from 1002 to 1014.

**3.ANDROID** 



Fig.6.3. Android

Android Is An Operating System Based On With A\* Java Programming Interface. It Provides Tools, E.G. A Compiler, Debugger And A Device Emulator As Well As Its OwnJava Virtual Machine (Dalvik Virtual Machine - DVM). Android Is Created By The OpenHandset Alliance Which Is Led ByGoogle. Android Uses A Special Virtual Machine, E.G. The Dalvik Virtual Machine. DalvikUses Special Byte Code. Therefore You Cannot Run Standard Java Byte Code On Android. Android Provides A Tool "Dx" Which Allows To Convert Java Class Files Into "Dex" (Dalvik Executable) Files. Android Applications Are Packed Into An .Apk (Android Package) File By The Program "Aapt" (Android Asset Packaging Tool) To Simplify Development Google Provides The Android Development Tools (ADT) For Eclipse. The ADT Performs Automatically The Conversion From Class To Dex Files And Creates The Apk During Deployment. Android Supports 2-D And 3-D Graphics Using The Opengl Libraries And Supports data storage in a SQLite database. Every Android applications runs in its own process and under its own userid which is generated automatically by the Android system during deployment. Therefore the application is isolated from other running applications and a misbehaving application cannot easily harm other Android applications.

#### PROGRAM

#### STREET LIGHT

#include <WiFi.h>
#include <HTTPClient.h>
const char\* ssid = "Redmi";
const char\* password = "spiderman";
const char\* serverName = "http://192.168.43.101:5000/test";
unsigned long lastTime = 0;
unsigned long timerDelay = 1000;

```
int stat_led=23;
int data led=22;
int ir1=\overline{21};
int ir2=19;
int ldr1=34;
int ldr2=35;
int relay1=18;
int relay2=5;
int count=0;
bool flag=0,flag1=0,flag2=0,flag3=0,flag5=0;
void setup_wifi()
 WiFi.begin(ssid, password);
 while (WiFi.status() != WL_CONNECTED)
 {
  delay(500);
  Serial.println("CONNECTING.....");
 Serial.println("CONNECTED");
}
```

#### void sendData(String val)

if ((millis() - lastTime) > timerDelay)
{
 if (WiFi.status() == WL\_CONNECTED)
 {
}

WiFiClient client; HTTPClient http; http.begin(client, serverName);

```
http.addHeader("Content-Type", "application/x-www-form-urlencoded");
   String httpRequestData = String(val);
   int httpResponseCode = http.POST(httpRequestData);
   Serial.println(httpResponseCode);
   if (httpResponseCode > 0)
   {
    String res = http.getString();
    Serial.println(res);
   }
   http.end();
  }
  else
  {
   Serial.println("WiFi Disconnected");
  }
  lastTime = millis();
 }
}
void setup()
 Serial.begin(9600);
 setup wifi();
 pinMode(stat led,OUTPUT);
 pinMode(data led,OUTPUT);
 pinMode(ir1,INPUT);
 pinMode(ir2,INPUT);
 pinMode(ldr1,INPUT);
 pinMode(ldr2,INPUT);
 pinMode(relay1,OUTPUT);
pinMode(relay2,OUTPUT);
}
void loop()
ł
 if (digitalRead (ldr1)==1)
  digitalWrite(relay1,HIGH);
 }
 else
 ł
  digitalWrite(relay1,LOW);
 }
  if (digitalRead (ldr2)==1)
 {
  digitalWrite(relay2,HIGH);
 }
 else
```

26

{

```
digitalWrite(relay2,LOW);
 }
 int ir1_val=digitalRead(ir1);
 int ir2_val=digitalRead(ir2);
 if(ir1_val==0)
 {
  flag1=1;
 }
 if(ir1_val==1 && flag1==1)
 {
  flag1=0;
  flag3=1;
 if(ir2_val==0 && flag1==0)
 {
  flag2=1;
 }
 if(ir2_val==1 && flag2==1)
 {
  flag2=0;
  flag3=0;
  count=0;
  digitalWrite(data_led,LOW);
 }
 if(flag3==1)
 {
  count++;
  digitalWrite(data_led,HIGH);
  Serial.println(count);
 }
 if(count==4000)
 {
  digitalWrite(stat led,HIGH);
  flag3=0;
  digitalWrite(data_led,LOW);
  sendData("X");
  count=0;
  delay(1000);
  digitalWrite(stat led,LOW);
 }
}
```

#### **ACCIDENT DETECTION**

#include<ESP8266WiFi.h>
#include<ESP8266HTTPClient.h>
#include<HttpClient.h>
#include<WiFiClient.h>

WiFiClient wificlient; HTTPClient http;

const char\* ssid="Redmi"; const char\* password="spiderman"; unsigned long int last\_post=0; int post\_interval=1000; int count=0;

int stat\_led = 16; int data\_led = 5; int buzzer = 4; int tilt = 14; int button = 12; bool flag1 = 0, flag2 = 0, flag3 = 0;

```
void setup wifi()
ł
 WiFi.begin(ssid,password);
while(WiFi.status()!=
WL CONNECTED)
 {
  delay(1000);
  Serial.println("CONNECTING....");
 Serial.println("CONNECTED");
}
void send_data(String A)
{
if(WiFi.status()==WL_CONNECTED&
&(millis()-last post)>=post interval)
 {
http.begin(wificlient,"http://192.168.43.1
01:5000/test");
  http.addHeader("Content-
Type", "application/x-www-form-
```

urlencoded");

4

```
String data=A;
  int httpcode=http.POST(data);
  String payload=http.getString();
  Serial.println(httpcode);
  last post=millis();
  if(httpcode>0)
   String res=http.getString();
   Serial.println(res);
  http.end();
 3
}
void setup()
 Serial.begin(9600);
 setup wifi();
 pinMode(stat led, OUTPUT);
 pinMode(data led, OUTPUT);
 pinMode(buzzer, OUTPUT);
 pinMode(tilt, INPUT);
 pinMode(button, INPUT);
}
void loop() {
 count++;
 Serial.println(count);
 if(count>100)
 {
  digitalWrite(stat_led,HIGH);
 }
 if(count>200)
 {
  digitalWrite(stat led,LOW);
  count=0;
 int b_val = digitalRead(button);
 int t_val = digitalRead(tilt);
 if(t val==0)
 {
 flag2=1;
if(t_val==1)
  flag2=0;
if(b_val==0)
```

{

```
flag1=1;
}
if(b_val==1 && flag1==1 && flag2==1)
{
    flag1=0;
    Serial.write('A');
    send_data("Y");
    digitalWrite(data_led,HIGH);
    digitalWrite(buzzer,HIGH);
    delay(1500);
    digitalWrite(data_led,LOW);
    digitalWrite(buzzer,LOW);
}
```

à

29

# Chapter 8 <u>PCB LAYOUT OF THE CIRCUIT</u>





Design of printed circuit board (PCB) can be considered as the last step in electronic circuit design as well as the first step in production. It plays important role in the performance and reliability of electronic circuits, the productivity of the PCB's its assembling, and its service ability depends on design. All these factors get reflected in a piece of electronic equipment. It is clear that task of PCB design is not very simple or always straight forward. The schematic is follower by layout generation. Layout design is the stage where engineering capacity combined with creativity is the governing inputs.

- Firstly, we verify the circuit using bread board.
- Then, draw the circuit using 'Diptrace'. All the components are provided there itself.
- Print the circuit on a cloth piece. The printed place will be transparent.
- After printing, keep it on copper clad, place paint on top of the circuit and gently pull the paint onto the circuit using a wiper. This process is called screening.
- Then place the circuit in ferric chloride solution. Let it sit for few minutes so that copper reacts with the solution and the copper in the masked area will remain as no reaction takes place on that area.
- Perform soldering and drilling and soldering on the necessary areas.
- Place the components as per the circuit diagram.

#### **FUTURE SCOPE**

The proposed system deals with the detection of the accidents. But this can be extended by providing medication to the victims at the accident spot. By increasing the technology we can also avoid accidents by providing alerts systems that can stop the vehicle to overcome the accidents. Artificial Intelligence cameras can be included in future for the real time monitoring of accident prone areas in real time with the help of AI Technology. Navigant Research estimates that by 2023, there will be 116 million LED street lights in use, one for each HPS fixture. These smart lights will help cities reduce electricity costs, lower CO2 emissions, and improve maintenance.

## **CHALLENGES**

This system cannot implemented in areas with heavy traffic as well as in areas with pocket roads. Sensing of objects other than vehicles will increase the complexity of the system. Proper maintenance in remote areas is a great challenge faced by the system. Areas with low network coverage will create difficulties in passing the information in specific required time.

14

# **ADVANTAGES**

The proposed system requires minimum human interference in the operation of street lights. By this method energy saving can be done effectively. The system helps to detects the occurance of accident in real time and initiates proper communication. It also analyses the chance of occurance of accidents. Rescue operations can be initiated within specific limited time.

.

## CONCLUSIONS

The "Street light monitoring and accident detection using IoT" is a cost effective, practical, eco-friendly and the safest way to save energy. This project helps to provide proper treatment for accident casualities and can reduce the deaths caused by accidents in remote areas. The system has much relevant in India where approximately 1.5 lakh people die of accidents every year.

14

#### REFERENCES

[1] "IoT-Based Smart Street Light Monitoring System with Kalman Filter Estimation"Edgardo Ricardo B. Sajonia;Lovely Mae Dagsa 2021 6th International Conference on Development in Renewable Energy Technology (ICDRET)

[2] "Design of intelligent light control system based on NB-IoT" Xiaoling Zeng; Jianping Zhang 2022 International Conference on Wearables, Sports and Lifestyle Management (WSLM)

[3] "Vehicle Accident Detection and Prevention using IoT and Deep Learning" Lakshmy S;Renjith Gopan;Meenakshi M L;Adithya V;Mariya R Elizabeth 2022 IEEE International Conference on Signal Processing, Informatics, Communication and Energy Systems (SPICES)

[4] "A Study on Cloud and IoT based Accident Detection & Prevention Systems" Shaik Areef;T Yuvanth Sai;V. Sri Harsha;Gubbala Satya Sai Deepak;Amarendra K;Pachipala Yellamma 2023 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS)

[5] "Smart Energy Efficient Home Automation System Using IoT" Satyendra K. Vishwakarma;Prashant Upadhyaya;Babita Kumari;Arun Kumar Mishra 2019 4th International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU)

28000 KEEE

Dr. LEENA A. V. PBINCIPAL SREE NARAYANA GURU COLLEGE OF SREE NARAYANA GURU COLLEGE OF SREE NARAYANA BURU SREE NARAYANA GURU COLLEGE OF KANNUR