

# **ANVESHANA 2012**

## **STUDENT PROJECTS TECHNICAL RECORD**

**Released on the occasion of  
Science & Engineering Fair of Selected Projects**

**at**

**SHIKSHAKARA SADANA, BANGALORE**

**On**

**7<sup>th</sup> & 8<sup>th</sup> February 2012**

*Organised by*

**Agastya International Foundation**

**In support with**

**Synopsys**

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## **FOREWORD**

Anveshana is the culmination of several months of effort and collaboration between College students and School pupils in the spirit of scientific enquiry. Thanks to the sponsorship of Synopsys and Agastya Foundation, a bridge of knowledge and mentoring has been built between college students and school students at a scale that has possibly not been attempted before. The results have been gratifying in terms of the in terms of both the quantity and quality of responses. The number of concepts that were proposed by the collaborating teams, the diverse nature of the subjects covered the depth to which some these manifested and the final output in terms of models have proved the worth of the effort overwhelmingly.

This book is a documentation of the output and while it is not exhaustive, it definitely seeks to capture the output. Often a large project such as Anveshana involving hundreds of students and mentors and a copious output does not get well documented and this book is to ensure the concepts methodology and output are well documented.

We at Agastya believe you will enjoy going through the book as much as we enjoyed putting it together.

### **Anveshana team**

## ABOUT AGASTYA

**Agastya** runs world's largest mobile hands-on science education program for disadvantaged children and teachers.

### **The Prime Minister's National Knowledge Commission**

(<http://knowledgecommission.gov.in/downloads/recommendations/PMLetterM&S.pdf>) has recommended the Agastya model for nationwide dissemination, and the Clinton Global Initiative has commended Agastya for its long term "commitment to action."

Agastya's mission to unlock the creative potential of poor children and teachers across India is being achieved through:

- 61 Mobile Science Vans which take science education to the village doorstep
- 30 rural Science Centers
- 172-acre Creativity Lab campus in AP (2 hours from Bangalore) where we have built science and art labs and a discovery center, and operate an eco-restoration program.

Agastya has reached over 5 million children and 150,000 teachers in several states, and is supported by scientists and educators from the Indian Institute of Science, DRDO and TIFR. Our 2020 goal is to touch 50 million children and 1 million teachers. By clicking on the following links you can watch the Agastya Mobile Lab in action:

<http://video.google.com/videosearch?q=agastya+vision&emb=0&aq=f#> and the film \*Spirit of Agastya <http://agastya.org/albums/albums/spirit.html>

\* (documents Agastya Foundation's efforts at 'sparking curiosity' in India's rural children. Over 60 of their mobile labs travel more than 600,000 kilometres per year taking low-cost experiments and lessons in science, math, ecology, and art to children in remote rural areas)

### **How Agastya International Foundation has positively affected the lives of disadvantaged children:**

Rote-based, didactic and uninspiring education in India has deprived over 250 million disadvantaged children of the tools to overcome poverty. Instead, it has produced education apathy, a high dropout rate and youth that lack skills and confidence, creative-thinking and problem-solving abilities. Most schools do not have labs. Opportunities for participative, hands-on learning that sparks curiosity, and stimulates and empowers children and teachers are almost non-existent. Teacher training is divorced from the realities of the school classroom. Seeing little value in education, rural parents prefer to send their children to work in farms, thus perpetuating a cycle of poverty.

Operating one of the largest hands-on science education programs in the world, Agastya offers disadvantaged children access to dynamic hands-on education that makes learning fun, awakens curiosity, encourages questioning, enhances understanding, and fosters creative-thinking, problem-solving and communication skills.

Agastya's vision of 'a creative India' - 'tinkerers, creators, solution-seekers ...humane, anchored and connected' – is being achieved through its mission to spark the creative temper among millions of disadvantaged children. Using experiential and hands-on, child-centric learning, teacher education and scalable methods, Agastya aims to bring about a shift in five vital behaviours - 'Yes to Why,' 'Looking to Observing,' 'Passiveness to Exploring,' 'Text-book to Hands-on,' and 'Fear to Confidence' – through following highly innovative and effective outreach channels:

- **Mobile Science Labs** take education to the village doorstep.
- **Science Fairs** promote learning in communities.
- **Interactive Science Centers** and **Teacher Education** sustain multiplier effects.
- **Youth-led Young Instructor Leader** programs promote self-belief and leadership.

#### **Agastya Creativity Lab at Gudivanka Village, Kuppam, Andhra Pradesh, India**

Agastya's unique 172 acre rural **Creativity Lab** (factory of ideas) boasts science, model-making, art and ecology labs, a Discovery Center and teacher education center. Learning's are disseminated via the outreach channels; new ideas are evaluated and assimilated, e.g., 1) Toy science with Cambridge University, 2) Engineering in Schools with Museum of Science, Boston. Children directly impact content and design through Q & As and other channels to improve the quality of *their* learning experience. Real-time impact monitoring and evaluation is done continuously.

#### **Looking Forward...**

Increase in college admissions, participation in science projects and competitions; demand for school labs and hands-on learning, and national interest in Agastya programs indicate that Agastya is positively impacting the lives of disadvantaged children. The Prime Minister's National Knowledge Commission has recommended India-wide scale up of the Agastya model; the Clinton Global Initiative has recognised Agastya's 'commitment to action'.

#### **Agastya's Objective:**

- Spark curiosity, creative-thinking and problem-solving skills
- Raise the confidence and self-belief of children and teachers
- Train and motivate teachers and governments to embrace hands-on learning methods
- Improve the quality of child-teacher interaction
- Expose children to new ways of learning (project-based, activity-based, learning-by-doing methods)

- Expose children to world-class educators
- Train a cadre of Young Instructor Leaders ('children-teach-children')
- Train a cadre of Agastya Instructors to act as change agents in rural villages
- Provide opportunities for learning and applying ecology and environment friendly practices to sustain livelihoods
- Reduce parental and other bottlenecks to child education by exposing village communities to Agastya learning methods
- Create a scalable and replicable education model for disadvantaged children anywhere in the world.

#### **Agastya Vision:**

**Creatively skilled rural India..**

**Entrepreneurially-enabled..**

**Improving the environment to..**

**Sustain it for future**

**Generations....**

#### **Mission of Agastya**

**Infuse and propagate a creative tempter in disadvantaged rural children and teachers through:**

- **Experiential, hands-on science education**
- **Teacher training and education**
- **Scalable, sustainable and environment-friendly methods**
- **Art and Ecology**

# PROJECTS EXHIBITED IN THE FAIR

S.No	PROJECT TITLE	COLLEGE NAME
<b>ELECTRONICS &amp; COMMUNICATION</b>		
1	PROPELLER DISPLAY	Sri Siddatrtha Institute of Technology, Tumkur
2	WIRELESS IRRIGATION SYSTEM CONTROLLER: A SMART IRRIGATION	Channabasaweshwara Institute of Technology, Gubbi
3	AUTOMATIC TEMPERATURE CONTROLLED FAN	Channabasaweshwara Institute of Technology, Gubbi
4	RAILWAY AUTOMATION SYSTEM	Channabasaweshwara Institute of Technology, Gubbi
5	MODERN SECURITY SYSTEMS	Channabasaweshwara Institute of Technology, Gubbi
6	SIXTH SENSE	Channabasaweshwara Institute of Technology, Gubbi
7	DTMF BASED HOME APPLIANCE CONTROLL USING CELL PHONE	Channabasaweshwara Institute of Technology, Gubbi
8	MECHATRONICS BASED HANDLING HOIST	Sridevi Institute of Engineering & Technology, Tumkur
9	INTELLIGENT INTENSIVE CARE UNIT	Kalpataru Institute of Technology, Tiptur
10	LINE FOLLOWER	M S Ramaiah Institute of Technology, Bangalore
11	ALCOHOL DETECTION AND DRIVER VIGILANCE	Sambhram Institute of Technology, Bangalore
12	TABLET ( Telemetric Animal Body Length Estimation Technique)	Vidya Vikasa Institute of Engineering & Technology, Mysore
<b>TELECOMMUNICATION ENGINEERING</b>		
1	BOREWELL WATER LEVEL MONETORING AND MOTOR PROTECTION SYSTEM USING GSM MODEM	Siddaganga Institute of Technology, Tumkur
2	CELL PHONE OPERATED LAND ROVER	Jawaharlal Nehru National College of Engineering, Shimoga

<b>COMPUTER SCIENCE &amp; ENGINEERING</b>		
1	BRAIN AND COMPUTER INTERFACE FOR SAFE DRIVING	Channabasaweshwara Institute of Technology, Gubbi
2	HOME AUTOMATION SYSTEM	PES Institute of Technology & Management, Bangalore
3	CONTROLLER FREE GAMING USING DEPTH SENSOR	BVB Enginnering College, Hubli
<b>BIO TECHNOLOGY</b>		
1	BIO ACTIVE COMPONENTS OF RHIZOPHORA SP	Sridevi Institute of Engineering & Technology, Tumkur
2	INDUCTION OF SYGMATIC RESISTANCE OF OKRA WITH OXYSPORUM WITH BIOCIDES	Sridevi Institute of Engineering & Technology, Tumkur
3	PORTABLE SPECTROPHOTOMETER FOR ANALYSING THE PURITY OF DRINKING WATER USING DYE REDUCTION TEST (FOR DETERMINATION OF TOTAL MICROBIAL CONCENTRATION)	Sir M Vishweshwariah Institute of technology Bangalore
<b>INFORMATION SCIENCE &amp; ENGINEERING</b>		
1	DEVELOPMENT OF SOFTWARE APPLICATION THROUGH ARCHITECTURAL CORRECTIONS FOR ON-LINE APPOINTMENT OF DOCTORS TO PROVIDE EFFECTIVE HEALTHCARE TO RURAL POPULATION OF TUMKUR DISTRICT	Sridevi Institute of Engineering & Technology, Tumkur
<b>ELECTRICAL &amp; ELECTRONICS</b>		
1	ADAPTIVE LIGHTING SYSTEM FOR AUTOMOBILES	Anjuman Institute of Technology, Bhatkal
2	ZIGBEE BASED REMOTE MAITENANCE SYSTEM	PES Institute of Technology & Management, Shimoga
3	GSM BASED AUTOMATION OF SUBSTATION	PES Institute of Technology & Management, Shimoga
4	PLC BASED MIXING AND FILLING SYSTEM	PES Institute of Technology & Management, Shimoga
5	TRANSISTORS	Sri Jayachamarajendra College of Engineering
6	STREET LIGHT CONTROLLER, EFFECTIVE POWER MANAGEMENT AND MINI ROBOT	Vidya Vikasa Institute of Engineering & Technology, Mysore

<b>ELECTRICAL ENGINEERING</b>		
1	AUTOMATED MULTISTOREY CAR PARKING SYSTEM	Vidya Vikasa Institute of Engineering & Technology, Mysore
2	AUTO TRAFFIC SENSOR	Vidya Vikasa Institute of Engineering & Technology, Mysore
<b>MECHANICAL ENGINEERING</b>		
1	EFFECTIVE WASTE DISPOSAL	NMAM Institute of Technology, NITTE, Udupi
2	SOLAR POWER AIR CRAFT	Jawaharlal Nehru National College of Engineering, Shimoga
3	LEG OPERATED WASHING MACHINE	Jawaharlal Nehru National College of Engineering, Shimoga
4	LINE FOLLOWING ROBOT JACKS FOR LORRYS	GM Institute of Technology, Davangere
5	A SIX LEGGED, INTELLIGENT, MULTY PUPRPOSE WALKING ROBOT	Dayananad Sagar Academy Institute of technology & Management, Bangalore
6	DRIVER-FRIENDLY CAR HEADLIGHT SYSTEM	Sambhram Institute of Technology, Bangalore
7	WORKING MECHANISM OF ELECTROCHMICAL MACHINING	Don Bosco Institute of Technology

Presents



An initiative to bridge the gap between schools and engineering colleges  
to develop innovation and creativity through mentoring.

**INVITATION**  
**SCIENCE & ENGINEERING FAIR 2012**

**7th Feb 2012**

**Welcome Address: 10 am**  
**Sri. Ramji Raghavan**  
*Chairman, Agastya International Foundation*

**Inauguration: 10.10 am**  
**Erin Brennock**  
*Director, Corporate Affairs, Synopsys Inc. USA*

**Book Launch: 10:20**  
**Sri. G. Kumar Naik, I.A.S**  
*Education Secretary, Education Department,  
Government of Karnataka*

**Keynote Address: 10.30am**  
**Dr. V.S. Ramamurthy**  
*Director, NIAS*

**Honorable Jury Members**

**Dr. K.G. Narayanan**  
*Former Director  
Aeronautical Development Establishment, Bangalore*

**Dr. M.A. Ramaswamy**  
*Rtd. Prof. IISc*

**Dr. R.M. Vasagam**  
*Former Vice-Chancellor, Anna University*

**Other Invitees**

**Dr. K. Gopalakrishnan**  
*Chairman, IEl, Karnataka State Center*

**Dr. L.V. Muralikrishna Reddy**  
*Former Chairman, IEl, Karnataka State Center*

**8th Feb 2012**

**Keynote Address: 4 pm**  
**Dr. V.K. Aatre**  
*Scientist and former head of DRDO*

**Valedictory address followed by  
BEE certificate to Agastya staff: 4.15 pm**

**Dr. Pradip Dutta**  
*Corporate Vice President & Managing Director,  
Synopsys (India) Software Pvt. Ltd.*

**Certificates to winners: 4.45 pm**  
**Sri. M.N. Baig**  
*Director RMSA*

**Venue:**  
Shikshakara Sadana,  
Opp Kaveri Bhavan,  
K.G. Road, Bangalore 560009.  
**Contact +91 94495 96367**

Supported by



# ANVESHANA 2012

## PROGRAM CHART

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### 6<sup>th</sup> February 2012

4.30 pm to 5.30 pm	Registration of the teams with projects		
5.30 pm	TEA BREAK		
6 pm to 7 pm	Agastya Vision Movie/discussion	by	Sri. Ramji Raghavan
7.30 pm to 9 pm	Dinner		

### 7<sup>th</sup> February 2012 (INSIDE AREA)

8. am to 8.30 am	BREAKFAST		
10 am to 10:10 am	Welcome address	by	Sri. Ramji Raghavan
10:10 am to 10:20 am	Inauguration	by	Erin Brennock
10:20 am to 10:30 am	Book Launch	by	Sri. G. Kumar Naik, I.A.S.
10:30 am to 10:40 am	Keynote address	by	Dr. V.S. Ramamurthy
10:40 am to 11 am	TEA BREAK		
11 am to 1 pm	Models Judging	by	Dr. K.G. Narayanan Prof. M.A. Ramaswamy Prof. R.M. Vasagam
1 pm to 1.30 pm	LUNCH		
1.30 pm to 4.30 pm	Models judging		Continued
4.30 to 5.30 pm	TEA & BREAK		
5.30 pm to 5.45 pm	Agastya Vision/Mission		
6 pm to 7.30 pm	Cultural Program	by	Balaji & Team
7.30 pm to 8.30 pm	Dinner		

## 7<sup>th</sup> February 2012 (OUTSIDE AREA)

10 am to 4.30 pm      Science Fair (Agastya Models)      by      Agastya Young Instructor Leaders

## 8<sup>th</sup> February 2012

8. am to 8.30 am      BREAKFAST

10 am to 1 pm      Science Fair (Engineering models)      Open to school students & visitors

1 pm to 1.30 pm      LUNCH

1.30 pm to 3 pm      Science Fair (Engineering models)      Continues

3 pm to 4 pm      Press Meet      by      Sri. Ramji, Dr. Pradip Dutta and Sri. Sharat Kaul

4 pm to 4.10 pm      keynote address      by      Dr. V.K. Aatre

4.15 to 4.25 pm      Valedictory address      by      Dr. Pradip Dutta

4.25 pm to 4.45 pm      BEE Certificate to Agastya Staff      by      Dr. Pradip Dutta

4.45 pm to 5.15 pm      Certificates for winners      by      Sri. M.N. Baig

5.15 pm to 5.45pm      TEA BREAK

## 8<sup>th</sup> February 2012 (OUTSIDE AREA)

10 am to 3 pm      Science Fair (Agastya Models)      Open to school students & visitors

# PROPELLER LED DISPLAY

**COLLEGE:** SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY, TUMKUR

**GUIDE:** SANDRA

**COLLEGE STUDENTS:** CHETHAN M, VINAYAKA T K, PRAMOD N.M

**SCHOOL STUDENTS:** JAYASURYA, RAVI NAIK FROM SIDDAGANGA MATT SCHOOL

## ABSTRACT:

This project is a special kind of circular led display. With the help some mechanical assembly, LED count, hardware requirement, and hence overall cost is cut to very affordable price. Also, maintenance and repairing of the display is so easy, that anyone having a little electronics knowledge can take care of this. All the synchronizing can be implemented through software.

First of its kind, made using the 20-pin 8051 series microcontroller, this project use the principle of space multiplexing. This propeller display is mechanically scanned and displays the characters in digital format. Made from scrap it can be used anywhere and everywhere and the most amazing fact about this display is its crystal clear display. This display consists of just 8 bright LED's which are rotated to show the display.

For building this project, requirement is just a small 20 pin microcontroller, a position encoder, and LED's. This display can show the messages, which will require a whopping 525 LED's. So hardware and cost minimization is achieved.

## SUMMARY

Innovative method of display using only 7 LED's

# WIRELESS IRRIGATION SYSTEM CONTROLLER A SMART IRRIGATION

**COLLEGE:** CHANNABASAVESHWARA INSTITUTE OF TECHNOLOGY,GUBBI

**GUIDE:** HARISH S, K V JYOTHI PRAKASH

**COLLEGE STUDENTS:** ABHISHEK B N, ARJUN AMBEKAR

**SCHOOL STUDENTS:** JAGADISH GJC TUMKUR, JNANESHWARI & SHWETHA BHOOMI SCHOOL GUBBI

## ABSTRACT

India is a land of villages; main occupation of the people here is agriculture. Farmers in India face many problems in irrigating their land, like load shedding, improper power distribution etc... Due to the unscheduled power distribution the rural areas may get approximately 2 to 6 hrs. of 3 phase power supply/day. Most of the submersible and any other kind of irrigation pumps require three phase power, but three phase supply is limited to rural as well as urban areas.

The agricultural land is far away from the farmer's house and if the farmer wants to irrigate his land he has to go to the pump house and has to check for the availability of the 3 phase power and then he can turn on the pump. If he is not in the farm or is away from the irrigating area then he will never get the actual status of the motor, water flow, availability of the power, fluctuations in the voltage etc... This may lead to the motor burnouts, wastage of power and wastage of water.

Farmer cultivates many crops that require different amount of the water. The farm is elaborated and different types of plant are cultivated and to irrigate these areas the pipes are attached to the valves nearer to these areas and the water is supplied. Thus to supply water to different regions more no. of valves are required throughout the farm and these valves are mechanically controlled. Hence, while irrigating, farmer has to be there all the time in his farm.

Considering the effects of the above problems on the farmers, we have developed a device which can control the whole irrigation system remotely using wireless communication. The device consists of a remote which will be with the farmer and a controlling unit at the pump house which controls the pump and the valves.

#### **Introduction to wireless irrigation system controller:**

The device consists of two modules one is the portable remote which will be with the farmer and another one is the fixed module in the pump house. The remote consist of a transceiver, a microcontroller and the user interface for the farmer in the remote is provided with the indication LEDs, ON/OFF switch and region selection switches. Farmer will continuously get updated with the availability of power in the pump house in his remote. When there is no sufficient power to switch on the irrigation motor then, the farmer will get NO 3 PHASE indication. When there is a 3 PHASE, he then gets the 3 PHASE indication. Then he can switch ON/OFF the motor and can control the valve of the region which is to be irrigated using the remote. He will also get the indication regarding the status of the motor, water flow and the region which is irrigating.

The device in the pump house consist of 3 phase monitoring unit, water flow monitoring unit, a transceiver unit, valve controlling unit and a controlling unit. All the controlling actions such as switching on/off of the motor, controlling of the valves are done by the microcontroller. It also monitors the power and water flow. Any fluctuations in the power or no water from the pump will end up with shutting down of the motor. And the same will be noticed to the farmer.

#### **Advantages over conventional irrigation methods/system:**

- 1) By using wireless system controller, farmer can control the pump remotely.
- 2) Farmer can get the real time status of the power, motor, water flow and also the indication of the region which is irrigating.
- 3) \*It protects the motor burnouts by monitoring the power and water flow.
- 4) \*\*This device can eliminate AUTO STARETR and SINGLE PHASE PROTECTOR which is used in the conventional motor control system and hence minimizes the cost. (Auto starter is used to turn on the motor automatically when the power arrives. Since many motors works on 3 phases it requires single phase protector to avoid motor burnout due to sudden trip

to 1 phase)

- 5) It minimizes wastage of water and wastage of power and reduces the maintenance risks.
- 6) The functionality of the device will help the farmers to irrigate his land properly and to get the good yield.
- 7) Farmer can control the valves remotely without entering into the farm. Hence the farmer can irrigate more of his land in less amount of time.
- 8) This device is cost effective and efficient for the farmers.
- 9) Farmers spend most of the time in irrigating their lands. By implementing this device they can save that time and can involve themselves in other work, so that the economic status of the farmer will be improved.
- 10) \*\*This device can also be used in the urban as well as rural, domestic water supply system.

### **Three phase and single phase motors:**

Most of the irrigation pumps in India work on three phases. Now a day's many companies have introduced many single phase motors, but considering the requirement to pump the water from 50 to 400 feet down from the earth surface, the three phase motors take a significant role in the Indian agricultural sector. A single phase induction motor is one designed to run on a single phase supply by providing a rotating field, but one that reverses 180 degrees. Starting is usually to split the single phase into two phases separated by 90 degrees, commonly using a capacitor or inductor in series with the starting winding. The start winding is often switched out once the motor has started. In a household application they are common in refrigerators and air conditioners. Fans and other items using smaller motors that don't need a strong starting torque commonly use a shaded pole motor, but these are not as efficient. It is uncommon for single phase motors to be much more than 5 HP in size, because they are not as suitable as three phase motors.

Three phase induction motors have three phases, so the first requirement is a 3 phase supply. The three phases are 120 degrees apart, so that a proper rotating field is produced. They tend to be smaller and cheaper and run smoother than an equivalent single phase motor. They can be more efficient than some single phase motors. As some of these can be large, they can need a specific starting arrangement to reduce the sudden surge at start-up, and perhaps to control the acceleration. Sometimes a star-delta starter is used, and these need a supply with neutral. There would be 6 wires brought out from the windings for this purpose, one pair for each phase. Some even have 12 wires, so they can accommodate a range of voltages as well. Hence, almost all irrigation pumps are of 3 phase motors.



Fig: Three phase and submersible pumps.

**A survey on :**

a) How much water an agricultural crop plant consumes:

Farmer cultivates many crops that would consume different amount of water for different crops. Farmer grows many crops like paddy, areca nut, coffee, wheat etc. Crops like paddy consumes more water, crop like coffee needs less water. The influence of the crop type on the crop water need is important in two ways:

(A) The crop type has an influence on the daily water needs of a fully grown crop; i.e. the peak daily water needs: a fully developed maize crop will need more water per day than a fully developed crop of onions.

(B) The crop type has an influence on the duration of the total growing season of the crop. There are short duration crops, e.g. peas, with duration of the total growing season of 90-100 days and longer duration crops, e.g. melons, with duration of the total growing season of 120-160 days. And then there are, of course, the perennial crops that are in the field for many years, such as fruit trees, coconut etc...

While, for example, the daily water need of melons may be less than the daily water need of peas, the seasonal water need of melons will be higher than that of beans because the duration of the total growing season of melons is much longer. Hence, it is important to supply the water in very efficient manner to get the good yield of the crops. And it needs proper and continuous maintenance from the farmer, but in the present environment it is very difficult to fulfill the water needs of the agricultural crop.

b) Load shedding and power cuts:

To grow the crop efficiently and to increase the yield of the crops, water has to be supplied in the regular intervals, but due to the power cuts and load shedding, crops doesn't get sufficient amount of water. Hence, the yield decreases or the crop may not able to yield. This has the major impact on the farmer's economic condition.

Because of globalization and privatization more concentration is put towards the industries. Most of the industries were established in urban areas. Because of the industries facilities and infrastructures in the urban areas, population densities are more in urban areas and hence these areas get more electricity.

Since the power generated from all the sources is less when compared to consumption, government provides more power to the urban areas and to balance the power problems it enforces load shedding in rural areas. Today rural areas are put to 7-11 hours of load shedding and some areas get only 7-9 hours of electricity.

Thus the load shedding has the major impact on the farmer's life, even though after load shedding, the supplied power is unscheduled and the required 3 phase supply is provided at the night time.

c) Cost of Pumps and accessories:

- Cost of the water pumps is more than 4000 INR; depend upon the size and power.
- Cost of the single phase protector is between 500-3000 INR; depend upon the quality.
- Cost of the auto starter is around 500-3000 INR; depend upon the quality.
- Cost of the valves to guide the water is around 25-500 INR; depend upon the size and quality.
- Cost of the pipes to guide the water is around 250-1000 INR/piece depends upon the size, length and quality.

By looking at the above three surveys we came to know about consumption of water by plants, how load shedding is enforced on rural areas and cost of the pump and accessories.

According to the above 3 survey, to obtain the good yield of the crops it is necessary to supply the water properly in the available duration of the power supply in very less amount of the cost. To accomplish this we have developed a device to overcome the above problems in the best possible way.

**How wireless irrigation system controller works:**

Wireless irrigation system controller consists of two modules:

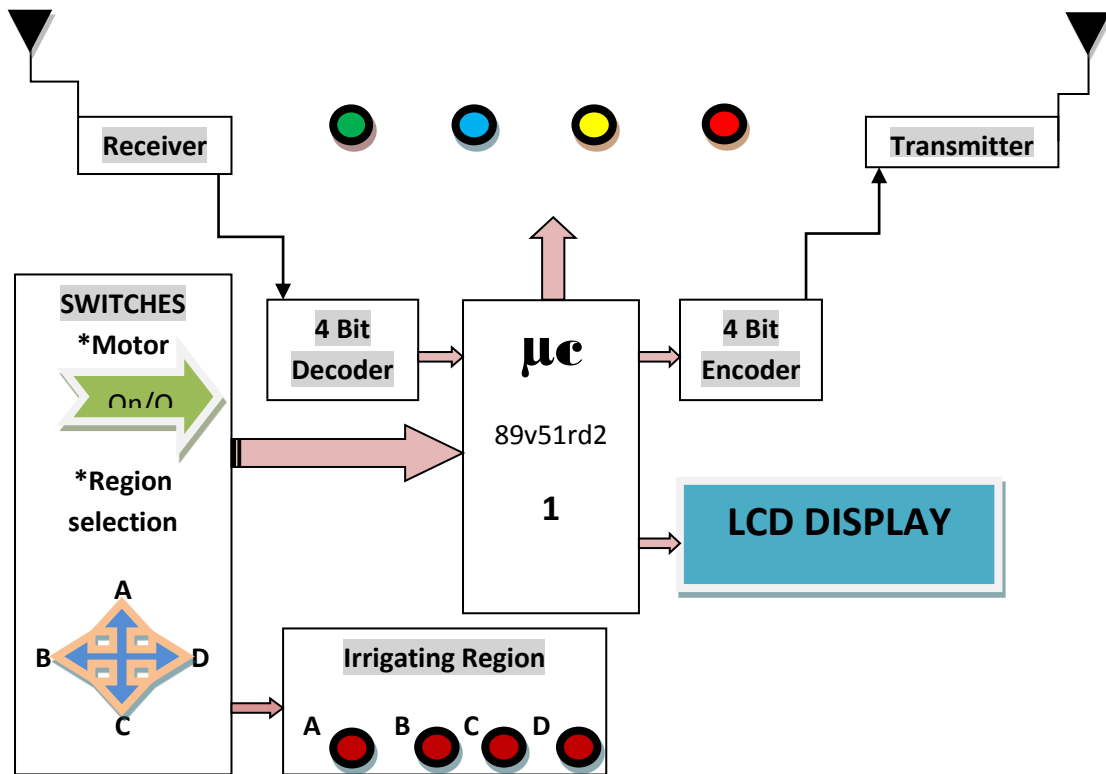
- One is the portable remote which will be with the farmer.
- A fixed module in the pump house.

**Module 1: Remote**

The receiver of the remote operates at radio frequencies will receives the message from the module 2. It is then decoded to 4 bit wide data, which is fed to the microcontroller. Microcontroller reads the data and performs the corresponding operation.

For example if the data is indicating the NO 3 PHASE situation then the GREEN LED in the remote will glow, indicating that 3 phase is not there and the same will be displayed on the LCD DISPLAY. Similarly when 3 phase power is there, then BLUE LED will glow. Then the farmer can switch on the motor by using motor ON/OFF switch on the front panel of the remote which sends the particular 4 bit encoded data to the MODULE 2 by means of RF transmitter. Then the MOTOR ON indication 'YELLOW LED' will glow in the remote. If motor is lifting the water then RED LED will glow in the remote so that farmer can ensure that motor is running smoothly. Then the farmer can open the valve of region which is to be irrigated and the region is also indicated in the remote.

## BLOCK DIAGRM: MODULE 1



Block Diagram: Module 1: Remote

### Module 2:

- The module 2 will consist of
- 3 Phase monitoring unit.
- Water flow monitoring unit.
- Transceiver unit.
- Controlling unit.
- Motor control unit.
- Valves control unit.

### 3 Phase monitoring unit:

It consists of 3 step-down transformers, rectifiers, relays and line indication LEDs. The 3 phase monitoring unit will continuously monitors for 3 phase power and indicates the power in the corresponding line (i.e. RYB). This monitored signal is than fed to the micro controller for further operations.

### Water flow monitoring unit:

It consists of a step-down transformer, relay and a pipe with two electrodes. A step-downed ac signal is passed through the water to detect the flow in the pipe. AC signal is used to reduce the

electrolysis process of the electrodes. This signal is then fed to the microcontroller to continuously monitor for the water flow.

**Motor control unit:**

This unit controls the switching actions of the Motor upon receiving the Motor on command from the remote. This unit is controlled by the microcontroller. 14

**Valves control unit:**

This unit controls the switching of the valves upon receiving the region selection command. When region switching command is received, microcontroller opens the corresponding solenoid valve depending upon the received information.

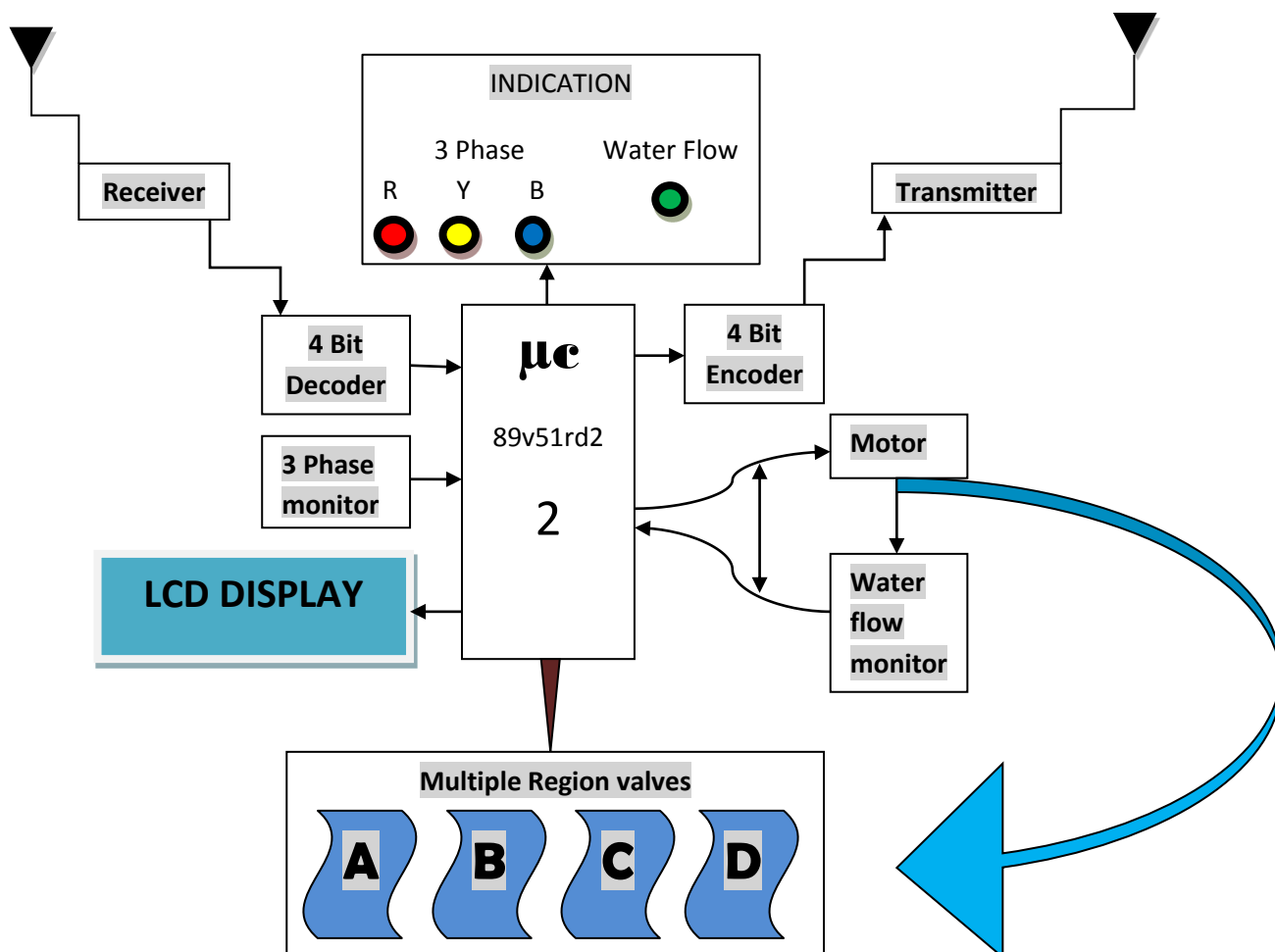
**Working:**

Firstly the MODULE 2 will Monitor for 3 PHASE power and if it is not there the corresponding 4 bit encoded data will be sent to the remote to indicate the NO 3 PHASE Power situation, if all the 3 phases are there then the information indicating the availability of the 3 phase will be sent to the farmer. If the MOTOR ON command is sent from the remote then it will be received by the receiver of the module 2, it is then decoded and read by the microcontroller, according to the data received the MOTOR will be switched ON and the microcontroller will monitors the water flow and the information is send to the remote to indicate the water flow. After this when the farmer selects the particular region for irrigation, the corresponding information will be sent to the module 2 from the remote and the corresponding valve will be opened. If any information comes to switch the region then the corresponding valve will be opened by closing the opened valve. If the information carrying MOTOR SHUT DOWN command is received then the motor will be switched off and the same will be noticed to the farmer.

The microcontroller in the module 2 will continuously monitors for availability of the 3 PHASE power and also monitors the water flow, if any condition is not satisfied, then the motor will be switched OFF and the status of the motor is sent to the farmer.

This module will also indicate the availability of the power in the particular line so that the farmer can easily resolve the power related problems in the pump house. It also indicates the water flow, which helps in detecting the presence of water in the water source used by the farmer for irrigation purpose.

### Block Diagram of the module which is at the pump house:



**Block Diagram: Module 2**

### Solenoid valve:

A solenoid valve is an electromechanical valve used with liquid or gas. The valve is controlled by an electric current through a solenoid. In the case of a two port valve the flow is switched on or off; in the case of a three-port valve, the outflow is switched between the two outlet ports. Multiple solenoid valves can be placed together on a manifold.

Solenoid valves are the most frequently used control elements in fluidics. Their tasks are to shut off, release, dose, distribute or mix fluids. They are found in many application areas. Solenoids offer fast and safe switching, high reliability, long service life, good medium compatibility of the materials used, low control power and compact design.

Besides the plunger-type actuator which is used most frequently, pivoted armature actuators and rocker actuators are also used.

A solenoid valve has two main parts: the solenoid and the valve. The solenoid converts electrical energy into mechanical energy which, in turn, opens or closes the valve mechanically.

These valves are installed in place of the manual controlled valves and thus it helps in switching the region of irrigation. The cost of the solenoid valve is around 1000-3500 INR.



#### **FUTURE DEVELOPMENT:**

- 1) The GSM module can be included. So that all the controlling actions are done by using mobile phone and which can provide unlimited range.
- 2) For out of coverage areas, higher range modules can be developed by using FM, ZIGBEE, etc.
- 3) Sensors can be adopted to check if the particular region is irrigated completely or not.
- 4) Timing functionality can be included to switch the region of irrigation after some pre-defined amount of time.

#### **CONCLUSION**

Wireless irrigation system controller is a device developed to reduce the farmer's risk. It helps the farmer in irrigating his land efficiently without entering into the farm. Farmer can control the motor and the valves remotely from his home. Farmers invest heavy amount of money on the motors and its accessories. If the power supply is improper then there is a possibility of motor burnouts. This device reduces the motor burnouts by immediately turning off the motor when there is power imperfection.

# AUTOMATIC TEMPERATURE CONTROLLED FAN

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**GUIDE:** K V JYOTHI PRAKASH

**COLLEGE STUDENTS:** SHRINIDHI.S, SUVARNA.D.S

**SCHOOL STUDENTS:** ASHOK GJC TUMKUR, MOULYA, MEGHANA BHOOMI SCHOOL, GUBBI

## ABSTRACT:

It controls the rotation of the fan according to temperature variation. As temperature increases, the rotation of the fan increases and vice-versa. We used a thermistor, which produces the varying voltage according to temperature along with a voltage divider circuit. We can replace the thermistor by a biomedical thermistor which generates varying voltage for a small change in temperature.

## SUMMARY:

It deals with the varying the speed of the fan according to temperature.

# RAILWAY AUTOMATION SYSTEM

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**GUIDE:** K V JYOTHI PRAKASH

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**SCHOOL STUDENTS:** LIKITH KUMAR GJC TUMKUR, PAVAN RAJ, SHARVARI SHANKAR BHOOMI SCHOOL, GUBBI

## ABSTRACT:

Railways are one of the most used modes of transport in India. Millions of people travel everyday by train from one place to another. As the dependency on this mode of transport is more, the passengers must have enough facilities on board the train for their journey. One of the main problems the passengers face on the train is the lack of information of the arriving station details, the passengers are left in a dilemma about their arrival of next destination station. This causes a great amount of difficulty among the passengers. Hence here we propose an embedded system solution for the better understanding of this public transportation system.

## INTRODUCTION

Railways are one of the most used modes of transport in India. Every year about 7.3 billion people travel by train in India alone. About 17,000 trains travel in India every day. It generates a large amount of revenue for the railways as well as for the nation. Even though the railways have grown into such a big infrastructure it still lacks many basic features for the comfort travel of the people. One of the main problems the passengers face on the train is the lack of information of the

arriving station details, the passengers are left in a dilemma about their arrival of next destination station. This causes a great amount of difficulty among the passengers. Hence a proper system must be implemented for the proper guidance for the passengers.

In the proposed method, each compartment of the train will have a LCD display which displays the information about the arrival of the next railway station, and the details of the later station and its distance from its previous station. Whenever a station is approaching, the LCD will automatically display the arriving station details. As it stops at the station, it starts to display the basic information about that particular town or city. This is achieved by radio communication between the train and the railway station.

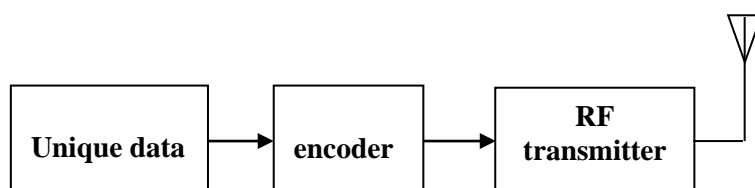
Apart from this, the train compartments will also have a verbal announcement along with the LCD display for playing the message through audio. The LCD display could be used to display **advertisements** through the train's journey. This will generate large amount of revenue for the railways.

### PRESENT SCENAR

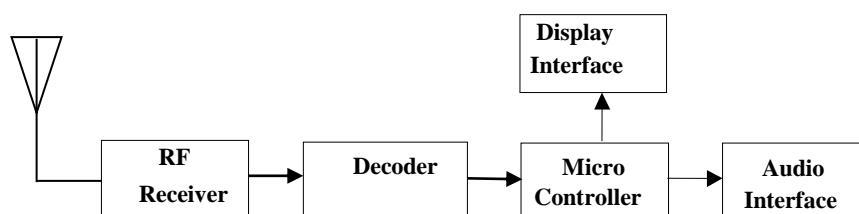
In the present day situation, one of the main problems the passengers face on the train is the lack of information of the arriving station details. Whenever a person on board the train, he or she will come to know of the arriving station only when they arrive at the station, so there will be a huge rush in getting down the train. This problem is considerably more while travelling at night. Thus the present system has failed in making the railways system customer friendly. Keeping all these disadvantages in mind, here we have proposed an embedded system based solution for making railway system more user-friendly.

### Block Diagram:

Transmitter end:



Receiver end:



## APPROACH & IMPLEMENTATION

In the proposed embedded system, a master controller unit would be installed at each railway station. The master controller will have a RF transmitter-receiver which will always transmit a sequence of code in the form of a RF signal around a radius of 3-4 kms. Each railway station will have a specific code allotted to it so that an approaching train would identify the station and display the corresponding details about the station.

The train will have a controller unit which would consists of a microcontroller, **RF** receiver etc. When the train approaches a railway station, the train will receive the station's signal through its RF receiver and decode the data and compare the code with an inbuilt database of railway stations and its codes and then displays the corresponding railway station's information onto the **LCD** display placed at each compartment.

An LCD display and audio speakers will be installed at each compartment of the train, all these units will be connected to the microcontroller which will display on LCD and play audio of the designated message. The microcontroller will be connected to the RF transmitter-receiver via the encoder-decoder unit which will simultaneously encode the signal and transmit the data using the RF transmitter and also will receive the signal from the station using the RF receiver and decode the received signal, this ensures security as the information would be coded in a particular format.

The LCD will be of a single-line or a two-line display,

As with respect to the LCD display in the train, it would display the basic information of the arriving station such as,

- The name of the arriving station.
- The distance between arriving station and the next arriving station.
- The approx. time required to travel between them.

The type of microcontroller used would be of 8051 architecture. Here it is the heart of the system which processes all the data from or to the RF module via the encoders/decoders, and also displays the messages onto the LCD.

For more enhanced features, the LCD could be used to display **advertisements** through the train's journey. This will generate large amount of revenue for the railways.



### **MICROCONTROLLER:**

A microcontroller (sometimes abbreviated  $\mu\text{C}$  or MCU) is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals. Program memory in the form of NOR flash or OTP ROM is also often included on chip, as well as a typically small amount of RAM. Microcontrollers are designed for embedded applications.

Microcontrollers operate in real time (predictable, though not necessarily fast) response to events in the embedded system they are controlling.

In this system, the microcontroller recognises the operation selected by the user and sends a specific corresponding code to the encoder.

### **Transmitter Unit:**



### **ENCODER:**

An encoder is a device, circuit, transducer that converts information from one format or code to another, for the purposes of standardization, speed, secrecy, security, or saving space by shrinking size.

In this system, the encoder encodes or converts the information received from microcontroller to another format and sends it to the RF transmitter.

### **RF Transmitter:**



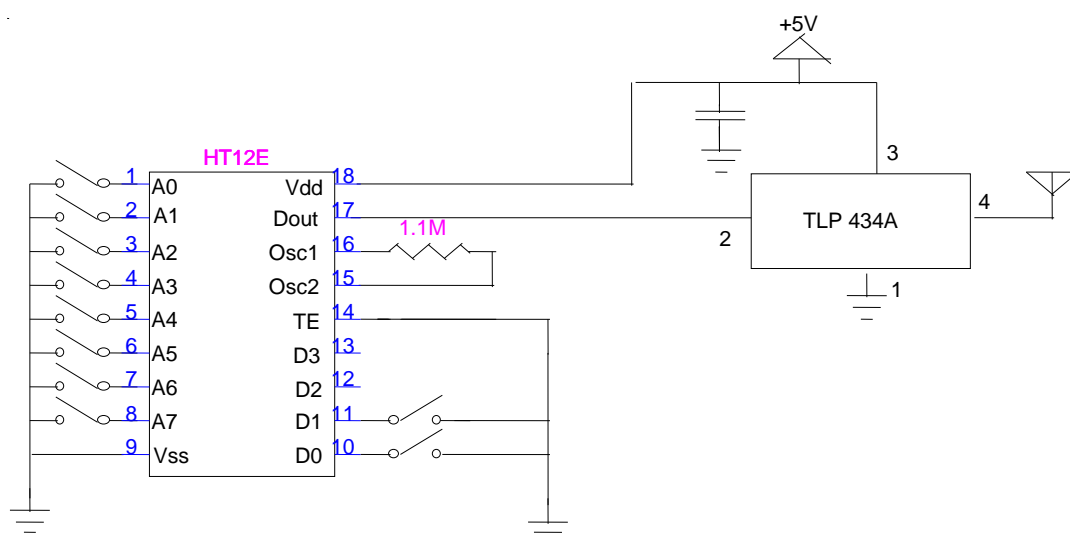
**TLP 434A**

In electronics and telecommunications, a transmitter or radio transmitter is an electronic device which, with the aid of an antenna, produces radio waves. The transmitter itself generates a radio frequency alternating current, which is applied to the antenna. When excited by this alternating

current, the antenna radiates radio waves. In addition to their use in broadcasting, transmitters are necessary component parts of many electronic devices that communicate by radio, such as cell phones, wireless computer networks, and navigational beacons. The term transmitter is usually limited to equipment that generates radio waves for communication purposes; or radiolocation, such as radar and navigational transmitters.

Transmitter module is an electronic component using a variety of radio signals to remote control the target device which has a receiver module built-in. The remote distance can be very long and you don't need a line-of-sight remote controlling compared to remote controls using infrared technology. And RF modules are widely used in garage door openers, wireless alarm systems, industrial remote controls and wireless home automation systems.

Here the encoded data is converted into RF signals and transmitted. The range of the signal depends upon the strength of the RF signal. More the strength more would be the range of transmission.



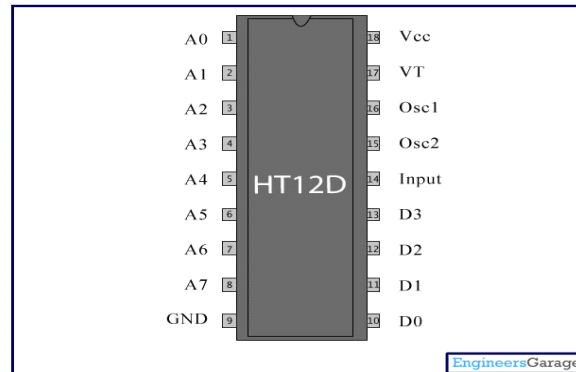
The above circuit is the transmitter unit which would be placed at the railway station.

Here, the transmitter circuit consists of a **RF** transmitter and an encoder circuit. The **RF** transmitter TLP-434A used is an ASK-type transmitter which operates at the frequency range 433.92MHz. The HT12-E is an encoder 18 pin DIP IC which is capable of encoding 12 bits of information i.e. 8 address bits (A0-A7) and 4 data bits (D0-D3).

The code to be transmitted is given at the data bits and address lines of **HT12-E** IC which is encoded and transmitted through **Dout** pin which is connected to the input of the **RF** transmitter where the data is transmitted through its antenna.

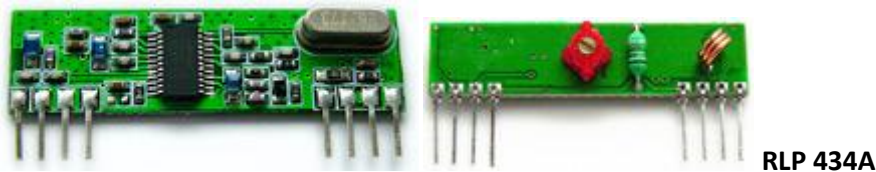
## Receiver unit:

### DECODER:



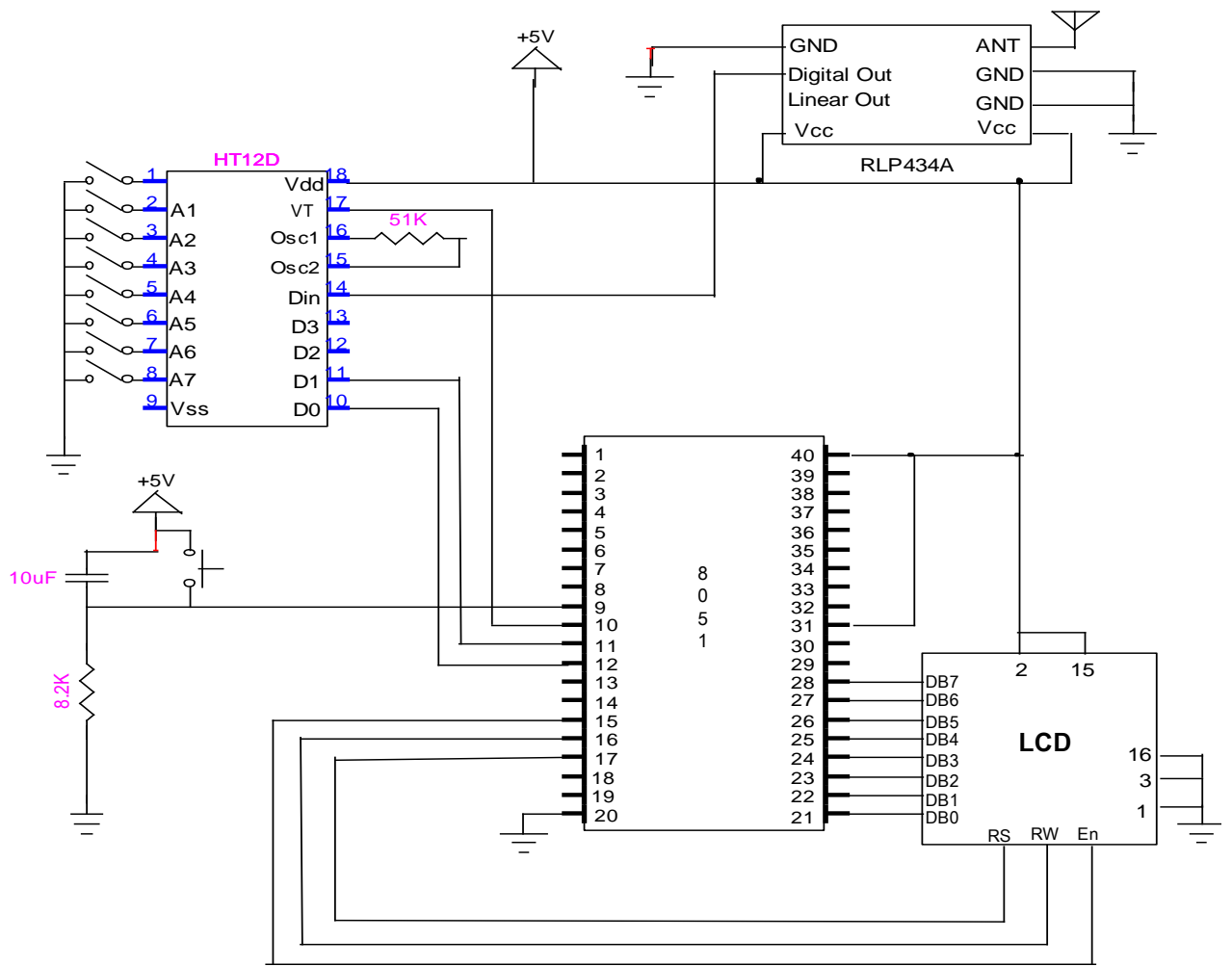
A decoder is a device which does the reverse operation of an encoder, undoing the encoding so that the original information can be retrieved. The same method used to encode is usually just reversed in order to decode.

### Receiver circuit:



The radio receiver converts the radio frequency signal into electrical signal which is then sent to the decoder.

A radio receiver is an electronic device that receives radio waves and converts the information carried by them to a usable form. It is used with an antenna. The antenna intercepts radio waves and converts them to tiny alternating currents which are applied to the receiver, which extracts the desired information. The receiver uses electronic filters to separate the wanted radio frequency signal from all other signals, an electronic amplifier to increase the power of the signal for further processing, and finally recovers the desired information through demodulation and decoding. A radio receiver may be a separate piece of electronic equipment, or an electronic circuit within another device. Devices that contain radio receivers include television sets, FM radios, radar equipment, cell phones etc.



The above circuit is the receiver unit which would be placed at the railway station and at each train.

The receiver unit consists of a **RF** receiver, decoder circuit, an 8051 microcontroller and a **LCD** display.

The **RF** receiver **RLP434A** is a SAW based receiver capable of receiving signals of frequency range 315, 418 and **433.92MHz**.

The **HT12-D** IC is an decoder 18 pin DIP IC which is capable of decoding 12 bits of information i.e. 8 address bits (A0-A7) and 4 data bits (D0-D3). It is compatible with **HT12-E** IC. An 8051 microcontroller is used to process the data received from the decoder. The PORT-2 of the 8051 is connected to the **LCD** display and PORT-3 is used for receiving the data from the decoder.

Here the RF signal received by the **RF** receiver **RLP434A** is passed onto the **HT12-D** decoder IC which checks the received signal **3 times** and the data is given to the PORT-3 of 8051 microcontroller where it compares the data with its inbuilt database of information and the corresponding message is displayed on the **LCD** display.

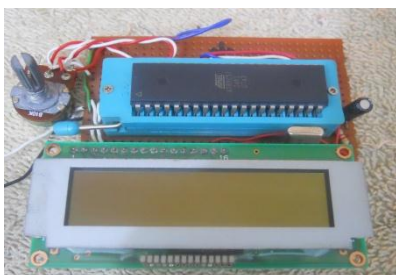
### **Liquid Crystal Display (LCD):**



A **liquid crystal display (LCD)** is an electronic visual display, or video display that uses the light modulating properties of liquid crystals (LCs). LCs does not emit light directly.

They are used in a wide range of applications, including computer monitors, television, instrument panels, aircraft cockpit displays, etc. They are common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones. LCDs have replaced cathode ray tube (CRT) displays in most applications. They are more energy efficient and offer safer disposal than CRTs. Its low electrical power consumption enables it to be used in battery-powered electronic equipment.

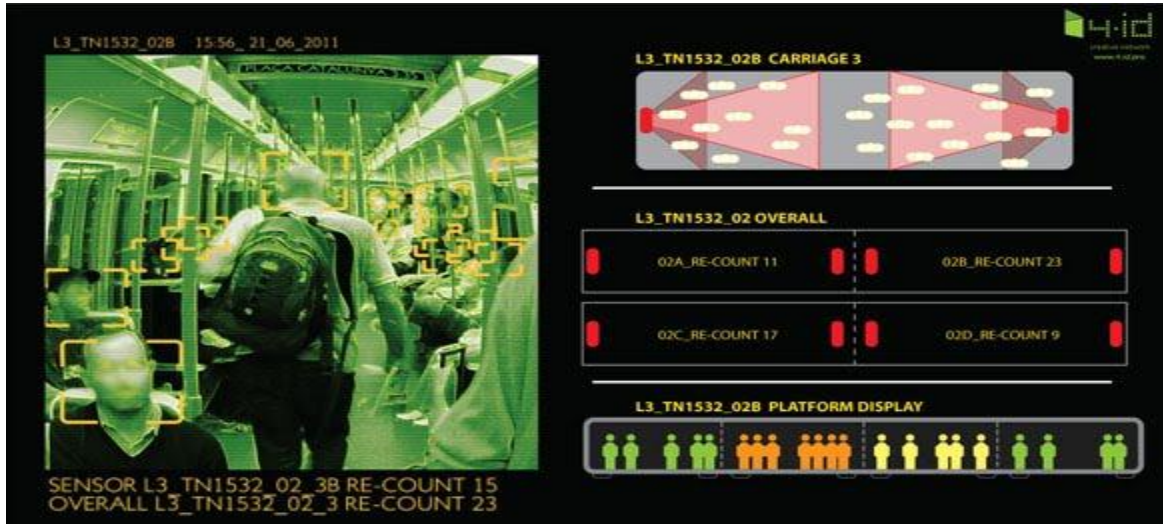
### **Interfacing LCD with Microcontroller:**



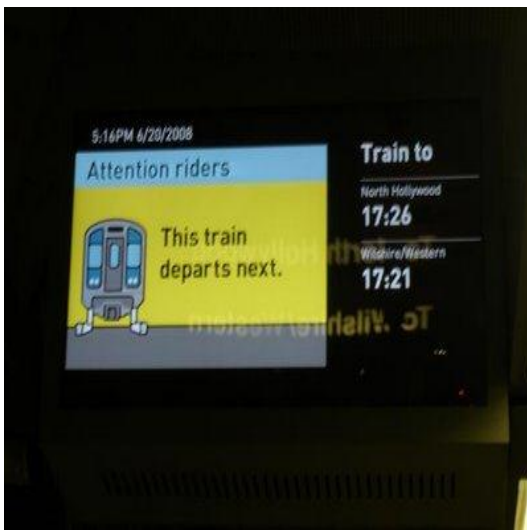
The LCD requires 3 control lines (RS, R/W & EN) & 8 (or 4) data lines. The number on data lines depends on the mode of operation. If operated in 8-bit mode then 8 data lines + 3 control lines i.e. total 11 lines are required. And if operated in 4-bit mode then 4 data lines + 3 control lines i.e. 7 lines are required

## Snaps of Applications:

Object counter in Train.



## Various Applications



## Future Enhancement

- The **verbal** announcement of the message displayed on the LCD can be implemented.
- The basic information of the particular city or town can be made to display upon its arrival, such as historic importance etc.

## CONCLUSION

Thus, by implementing the proposed embedded system the passengers can be assured of tension-free journey where they would get arrival information about all the stations throughout the train's journey.

As in the present system, there is no prior information about the arrival of the station in the train; this causes discomfort among the people during getting down of the train when the station arrives. Also in the railway stations there is no precise information about the arriving trains.

Therefore our system provides the passengers, the information about the arrival station in each and every compartment which in turn helps the passengers for their comfort journey.

Also additional features like displaying the basic details about the arriving city or town, LCD displays are used as a source of income by displaying **advertisements** through the train's journey.

Hence by adopting the proposed "**RAILWAY AUTOMATION SYSTEM**", the functioning and understanding of the railway system can be made much simpler.

## MODERN SECURITY SYSTEMS

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**GUIDE:** K V JYOTHI PRAKASH

**COLLEGE STUDENTS:** RAKESH K, MADHUMOHAN H S, PRASHANTH K R

**SCHOOL STUDENTS:** MANOJ KUMAR GJC TUMKUR, CHANDAN RAMESH, TEJAS BHOOMI SCHOOL, GUBBI

### ABSTRACT:

#### OUTDOOR BLOCK DISCRIPTION

IR transmitter will be transmitting IR rays continuously and the output pin of IR receiver will always be high. Whenever an unauthorized person passes in between these two, it gets interrupted and for a momentary time the output pin of the receiver will go low, the time period of this will be very small in terms of microseconds so this pulse is given to the trigger pin of the mono-stable multivibrator and the time period of pulse is increased. The output of multi vibrator is given to micro-controller which is programmed in such a way that on reception of a pulse it will send a data which will be the address of the specific home in which interruption has taken place. The data from micro controller is given to the encoder which in turn will be transmitted using a RF transmitter.

#### IN DOOR BLOCK DESCRIPTION

The data transmitted from the RF transmitter is received by the RF receiver and sent to the decoder which will check the address line of the encoder and will decode the data. Then the data

from the decoder is sent to micro controller which is programmed in such a way that on receiving the data it will display the name or address of the home in which interruption has taken place in the LCD screen and a red led will glow indicating the danger. This whole arrangement is kept in a central place within the home.

## **SUMMARY:**

It can be implemented to many homes. Each home will have its own outdoor and indoor circuit. On interruption in any one home message will be displayed in every home on their LCD screen kept inside their home. We have made it for three homes.

# **SIXTH SENSE**

**COLLEGE:** CHANNABASAVESHWARA INSTITUTE OF TECHNOLOGY, GUBBI

**GUIDE:** K V JYOTHI PRAKASH

**COLLEGE STUDENTS:** VINUTHAN B, SRINIVAS H V, SHWETHA K, RAGHU T H

**SCHOOL STUDENTS:** BHOOMI SCHOOL, GUBBI

## **ABSTRACT**

In this modern age, technology has played a very important role in the day to day activities of everyone's life. So, here we propose an embedded based solution which makes the use of devices, computers more user-friendly. In the proposed system, the gestures made by the user is recognized by a micro-controller and is transmitted wirelessly to another micro-controller which then controls functions and applications in a computer, home-appliances etc.

## **INTRODUCTION**

Technology has a great impact in every field. As the name of our project 'SIXTH SENSE' implies, it is the feature which makes the user operate and control the surrounding environment in an easy and efficient way.

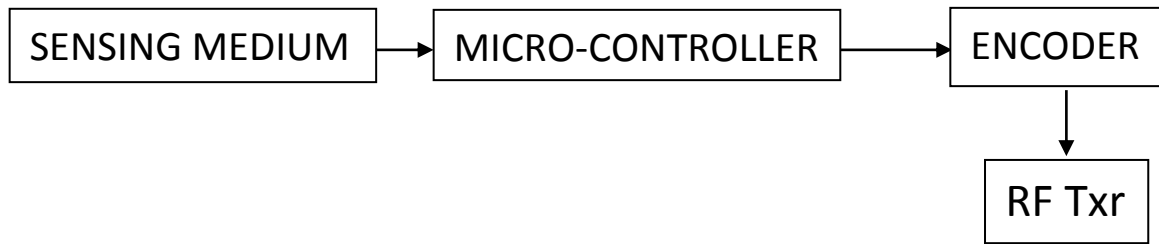
People say, "Necessity is the mother of inventions", but "comfort" is the mother of our invention. Nowadays people give their priority to the technology that provides them comfort.

Our proposed system allows the user to control home appliances like TV, fans, lights, etc without using switches and perform computer operations such as mouse control, play games, view photos and play music without using keyboard and mouse. We believe this system will help handicapped people to use the technology, reducing difficulty of operation of controlling the devices.

## **APPROACH & IMPLEMENTATION**

The proposed system mainly consists of a transmitter section and receiver section.

### Transmitter section:



The transmitter section is a wrist held device that can be mounted on the wrist of an arm. This device is used to recognize the actions made by the user. The transmitter unit consists of sensing medium, micro-controller, encoder and a RF transmitter. The different gestures made by the user's hands are recognized by the micro-controller and the data is encoded using an encoder HT12-E and is transmitted using a RF transmitter TLP 434A.

### SENSING MEDIUM:



The sensing medium is a small metal plate connected to each finger of the glove. Each finger here represents a particular function like switching ON/OFF a light etc. Both the thumb finger's metal plates are called selectors and are connected to ground, when the thumb fingers touch any other finger's metal; they complete a circuit leading to evoking of a specific function. The metal plates are connected by wires to a microcontroller.

### MICROCONTROLLER:



A microcontroller (sometimes abbreviated  $\mu\text{C}$  or MCU) is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals. Program memory in the form of NOR flash or OTP ROM is also often included on chip, as well as a typically small amount of RAM. Microcontrollers are designed for embedded applications.

Microcontrollers operate in real time (predictable, though not necessarily fast) response to events in the embedded system they are controlling.

In this system, the microcontroller recognises the operation selected by the user and sends a specific corresponding code to the encoder.

### **ENCODER:**



An encoder is a device, circuit, transducer that converts information from one format or code to another, for the purposes of standardization, speed, secrecy, security, or saving space by shrinking size.

In this system, the encoder encodes or converts the information received from microcontroller to another format and sends it to the RF transmitter.

### **RF Transmitter:**



**TLP 434A**

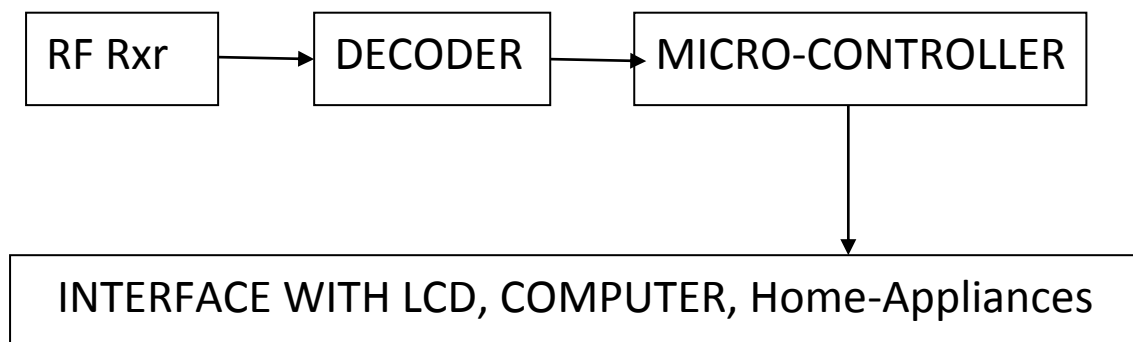
In electronics and telecommunications, a transmitter or radio transmitter is an electronic device which, with the aid of an antenna, produces radio waves. The transmitter itself generates a radio frequency alternating current, which is applied to the antenna. When excited by this alternating current, the antenna radiates radio waves. In addition to their use in broadcasting, transmitters are necessary component parts of many electronic devices that communicate by radio, such as cell phones, wireless computer networks, and navigational beacons. The term transmitter is usually limited to equipment that generates radio waves for communication purposes; or radiolocation, such as radar and navigational transmitters.

Transmitter module is an electronic component using a variety of radio signals to remote control the target device which has a receiver module built-in. The remote distance can be very long and

you don't need a line-of-sight remote controlling compared to remote controls using infrared technology. And RF modules are widely used in garage door openers, wireless alarm systems, industrial remote controls and wireless home automation systems.

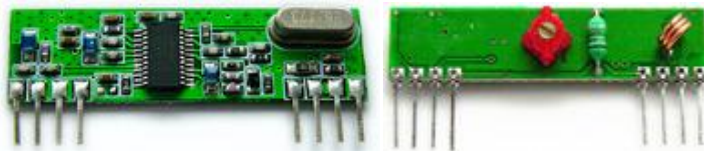
Here the encoded data is converted into RF signals and transmitted. The range of the signal depends upon the strength of the RF signal. More the strength, more would be the range of transmission.

### Receiver section:



The receiver unit consists of a RF receiver, decoder circuit, an 8051 microcontroller, a LCD display, serial interface (PC) section and home-appliances control section.

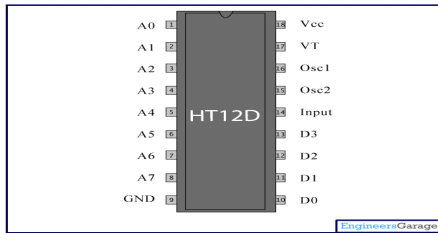
### RF Receiver:



### RLP 434A

The radio receiver converts the radio frequency signal into electrical signal which is then sent to the decoder.

A radio receiver is an electronic device that receives radio waves and converts the information carried by them to a usable form. It is used with an antenna. The antenna intercepts radio waves and converts them to tiny alternating currents which are applied to the receiver, which extracts the desired information. The receiver uses electronic filters to separate the wanted radio frequency signal from all other signals, an electronic amplifier to increase the power of the signal for further processing, and finally recovers the desired information through demodulation and decoding. A radio receiver may be a separate piece of electronic equipment, or an electronic circuit within another device. Devices that contain radio receivers include television sets, FM radios, radar equipment, cell phones etc.



**DECODER:**

A decoder is a device which does the reverse operation of an encoder, undoing the encoding so that the original information can be retrieved. The same method used to encode is usually just reversed in order to decode.

**Liquid Crystal Display (LCD):**



A **liquid crystal display (LCD)** is an electronic visual display, or video display that uses the light modulating properties of liquid crystals (LCs). LCs does not emit light directly.

They are used in a wide range of applications, including computer monitors, television, instrument panels, aircraft cockpit displays, etc. They are common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones. LCDs have replaced cathode ray tube (CRT) displays in most applications. They are more energy efficient and offer safer disposal than CRTs. Its low electrical power consumption enables it to be used in battery-powered electronic equipment.



**COMPUTER SERIAL PORT INTERFACE:**

In computer hardware, a port serves as an interface between the computer and other computers or peripheral devices. Physically, a port is a specialized outlet on a piece of equipment to which a

plug or cable connects. Electronically, the several conductors making up the outlet provide a signal transfer between devices.

Here, microcontroller communicates with the computer through the serial port and it commands to perform some specific operations on the computer.

#### **Applications:**

- Control **mouse** operations by hand gestures.
- View and edit **photos** on a computers by hand gestures.
- Controlling **home**-appliances.
- Play computer **games** by hand gestures and many applications etc.

#### **Conclusion:**

Thus, by implementing the proposed embedded system, the use of devices, computers can be made more user-friendly.

## **DTMF BASED HOME APPLIANCE CONTROLL USING CELL PHONE**

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**GUIDE:** JYOTHI PRAKASH K V

**COLLEGE STUDENTS:** RAJANI M V, SHILPA Y T,

**SCHOOL STUDENTS:** MOHAN GJC TUMKUR, MUKTHA, KSHAMA BHOOMI SCHOOL, GUBBI

#### **ABSTRACT**

Nowadays many people are looking for the methods to improve life conditions, comfort and at the same time, the simplicity of handling with domestic electric appliances. With the advent of new technology, the way of communication has changed; mobile phones have played a significant role in this regard. Mobile phones are now inexpensive, easy to use, and comfortable. As we know, these devices can also use for gaming, music, internet and many advanced purposes. Here we propose an embedded system that can control our home electrical appliances through a simple phone call by pressing the corresponding key.

#### **INTRODUCTION**

This circuit lets you operate your home electrical appliances like light, fans, water pump etc., from your office or any other remote places. So, if you forgot to switch off the lights or other appliances

while going out, it helps you to turn off appliances with your cell phone. The cell phone work as a remote control for your home appliances. You can control the desired appliances by pressing corresponding key.

### THE PURPOSE OF THE CIRCUIT

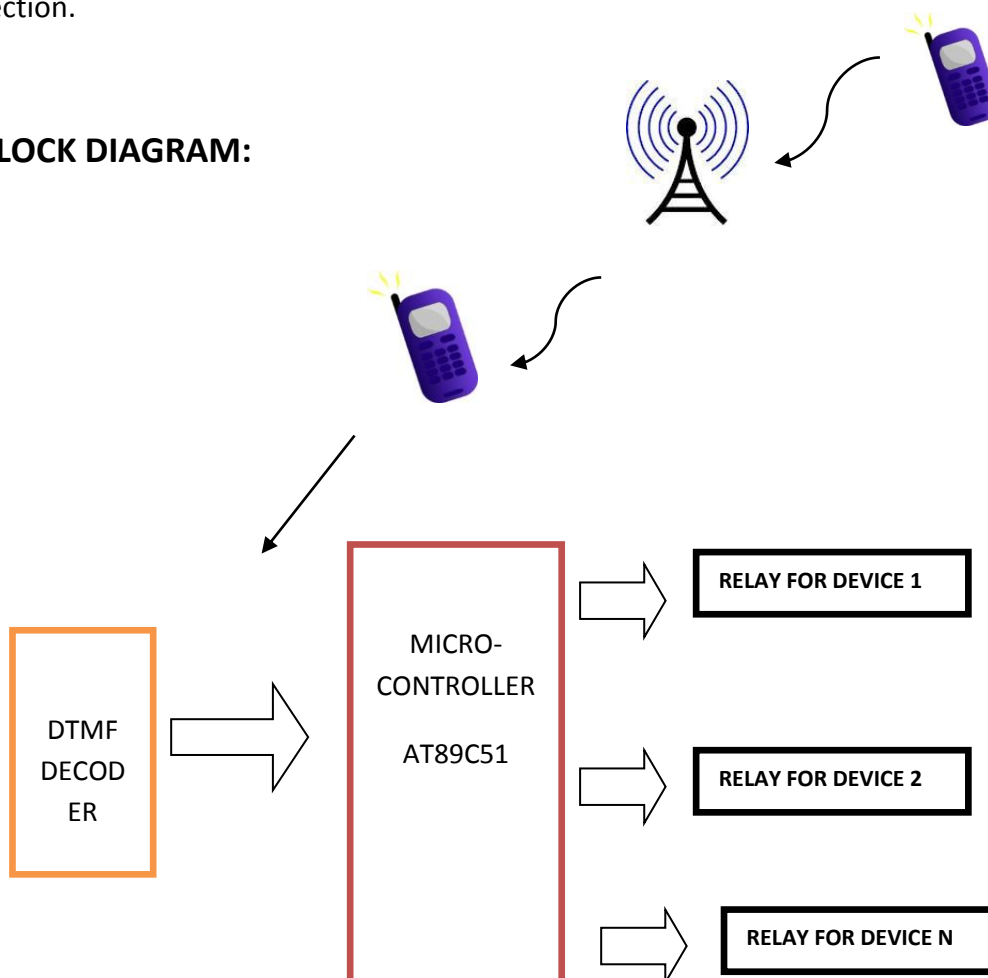
The purpose of our project is to develop DTMF signal controlled house monitoring system based on microcontroller. The device is connected to phone line and is controlled by signal emitted by the DTMF decoder in stationary or mobile phones. In presence of incoming call, the device pick up the call by auto- receive. User can press buttons or keys and control the system remotely. Functions of the keys should know initially.

### CIRCUIT DESCRIPTION

The block diagram shows the cell phone based remote control. It comprises microcontroller-AT89C51, DTMF decoder-MT8870 and a few discrete components.

There are two sections in the project, one is transmitter section and another one is receiver section.

### BLOCK DIAGRAM:



## WORKING

The microcontroller is configured to receive the decoded DTMF signal from DTMF receiver MT8870. The functions of the corresponding cell phone keys are as shown in the table:

### Functions of Mobile Keys:

Mobile keys	Functions
1	On device 1
2	On device 2
3	On device 3
4	Off device 1
5	Off device 2
6	Off device 3

DTMF decoder is used for decoding mobile signal it gets DTMF tones from the mobile headset's speakers pin decodes it into 4bit digital signal. DTMF decoder is operated with a crystal 3.579 MHz in DTMF receiver MT8870, capacitor is used to filter the noise and resistors help to amplify the input signal.

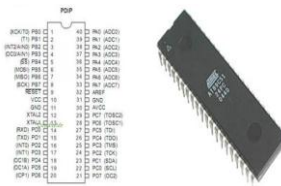
The micro-controller controls the devices with the help of relays RL1 through RL3 via relay driver IC ULN2003.

The circuit will work after getting the input from the mobile, depending upon the incoming signal; the corresponding action is performed according to table 1.

## COMPONENTS USED:

### MICRO-CONTROLLER

A **microcontroller** (sometimes abbreviated **μC**, **uC** or **MCU**) is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals. Microcontrollers are designed for embedded applications, in contrast to the microprocessors used in personal computers or other general purpose applications.



## D TMF DECODER

Dual-tone multi-frequency signaling (DTMF) is used for [telecommunication signaling](#) over analog telephone lines in the voice-frequency band between [telephone](#) handsets and other communications devices and the [switching center](#). The version of DTMF that is used in [push-button telephones](#) for tone dialing is known as Touch-Tone.

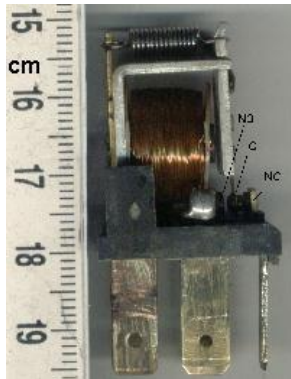


## KEYPAD:

The DTMF keypad is laid out in a 4×4 matrix, with each row representing a *low* frequency, and each column representing a *high* frequency. Pressing a single key (such as '1') will send a [sinusoidal](#) tone for each of the two frequencies (697 and 1209Hz). The original keypads had levers inside, so each button activated two contacts. The multiple tones are the reason for calling the system multi-frequency. These tones are then decoded by the switching center to determine which key was pressed.

DTMF keypad frequencies (with sound clips)

	1209 Hz	1336 Hz	1477 Hz	1633 Hz
697 Hz	<u>1</u>	<u>2</u>	<u>3</u>	<u>A</u>
770 Hz	<u>4</u>	<u>5</u>	<u>6</u>	<u>B</u>
852 Hz	<u>7</u>	<u>8</u>	<u>9</u>	<u>C</u>



## RELAY

A **relay** is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism mechanically, but other operating principles are also used. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits, repeating the signal coming in from one circuit and re-transmitting it to another. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

A type of relay that can handle the high power required to directly control an electric motor or other loads is called a contactor. Solid-state relays control power circuits with no moving parts, instead using a semiconductor device to perform switching. Relays with calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults; in modern electric power systems these functions are performed by digital instruments still called "protective relays".

### ADVANTAGES:

- It is the effective system which turns off the unwanted electric devices and minimizes power loss.
- It is flexible system compatible with any type of applications.

### CONCLUSION:

We can control our home devices from remote places using cell phone. This project can be used to minimize the power loss and it prevents the devices from damage.

# MECHATRONICS BASED HANDLING HOIST

**COLLEGE:** SRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR

**GUIDE:** SUHAS K.C, BASAVARAJU

**COLLEGE STUDENTS:** MEDA KARAN VENKATESH, GANESH M S, KIRAN K, HARIKEERTHI.

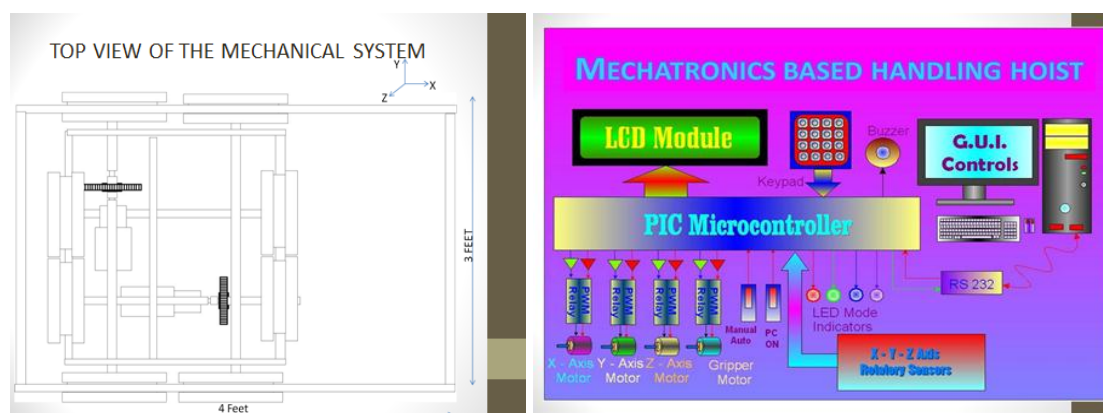
**SCHOOL STUDENTS:** RAKSHITH, SWAROOP K V, GHS TUMKUR.

## ABSTRACT:

In today's industrialized world, man produced goods play an important role in daily life, thus human society totally depends on all type of industrially produced goods as basic need. Even the raw material requirement plays a vital role in the industrialized world we live in. Our life quality today totally is defined by what we produce, and what we consume. This gives rise to high volume materials "goods movement from place to place as well as goods traveling vast distance locally, inter-state movement & goods moving around the world we occupy. fact of materials" goods movement between places without delay and reaching the destination in time plays an important role of success in industrial management along with profit made by the business and over all development of the country.

From this need, we derive the inspiration to build a concept trial miniature robotic prototype to address the problem of container management in logistics (company) and also in railway goods handling section which is done with manual hoist controls, where the operator with help of a hand held control panel move the container from parallely parked trains. This process of goods container movement between parked trains is a time consuming and labour intensive.

Our project will address this problem with the concept of preprogramed goods container movement based on data goods movement control manager computer. This is also coupled with operation by operator from a pc along with manual operation control panel.



### METHODOLOGY:

A 3 axis handling system is employed for material handling system provided with one clamper system.

The brief description of method is as defined below

1. The control is completely based on pc controller namely rs 232 chip.
2. This is supervised by pic microcontroller.
3. The 3 axis motor plus one gripper motor is connected to pic controller with help of relay systems.
4. There is a provision for manual as well as auto adjustment.
5. An LCD module is displayed for proper monitoring of the activities
6. LED mode indicators are shown for the purpose.

### ADVANTAGES OF AUTO ADJUSTMENT:

1. Whenever breakdown occurs it can be made corrected manually.
2. MLT up to some extent is reduced.
3. Minor adjustments are made.
4. Approach to repair is at ease.

The automated pc controllable four axis container model hoist can be realized to demonstrate the entire pick, move and place the freight container with the aid of embedded system and mechatronics based system design. The system we wish to design the above utility is based on a hoist bed where a y-axis movement is developed with motor and a gearbox to role on y-axis guide rails. This movement carried overhead where an x axis dual rail motorized gear box moves the container clipper pick a “drop mechanism made to move freely in the x axis direction. Thus an area of length and breadth is achieved to accommodate multiple parallel railway tracks where the freight trains are brought in from the sea port and their cargo is segregated and new flight trains to particular destinations are loaded with the aid of hoist. The z axis movement mechanism mounted on the x axis movement platform can move horizontally in board directions. Similarly the z axis system moves forward and reverse carrying the x axis mechanism. The z-axis where their lift and drop is achieved, the fourth axis being the gripper or the container latching mechanism is also rotary card based. So the entire four axis can be controlled with the aid of 4 motors to be managed by mechatronics based embedded hardware coupled with a graphic user interface located in the personal computer. Thus our project can be total controlled from the pc.

### UNIQUE FEATURES OF THE PROJECT:

1. Complete automation of material handling.
2. Single operator controls multiple units.
3. Distance between workstation to control station does not matter.

### EXPECTED OUTCOME OF THE PROJECT:

1. Manual labour is replaced by the machine there by reducing the regular labour cost as well as output rate is improved.
2. The lead time for manufacture i.e., the time between the order acceptance and delivery is least, with automation.
3. Safety of both labour and product is achieved.
4. Reduces the inventory and wip ratio.
5. Increases the velocity of the job, since non-value added activities in the process are reduced.
6. Material handling time can be reduced upto 55%-60% and hence handling cost reduced to 25%-30%

#### APPLICATION OF THE PROJECT:

1. Railway yard.
2. Mining places where the poisonous gases and men cannot enter.
3. Nuclear power plant to check the position of the moderators, electrodes & fuel rods.
4. Loading and unloading from ships.
5. Marine industries.
6. Good container management.
7. Material handling in heavy & small scale industries.

#### **SUMMARY:**

1. Complete automation of material handling.
2. Single operator controls multiple units.
3. Distance between workstation to control station does not matter.

## **INTELLIGENT INTENSIVE CARE UNIT**

**COLLEGE:** KALPATARU INSTITUTE OF TECHNOLOGY, TIPTUR

**GUIDE:** SUHAS K.C, BASAVARAJU

**COLLEGE STUDENTS:** SHASHIDHAR P, SHRIKANTH S P

**SCHOOL STUDENTS:** RAMU, ARUN GHS HONNAVALLI

#### **ABSTRACT:**

Machines best replace humans when it comes to handling monotonous and tedious jobs that require little intelligence and lots of patience. When the same tedious work becomes essential for survival, comes in the real importance of all the modern science and technology.

The best example of the above fact is seen in an intensive care unit (ICU) where a continuous monitoring of patients health is required; and negligence of the slightest degree may lead to misfortune. Giving the same medicine twice by different visiting nurses or doctors, giving the wrong medicine to the wrong patient, inability to take immediate decisions to tackle an unexpected emergency due to the non-feasibility of a doctor sitting near the patient all the time are some of the fatal shortcomings on the side of the caretakers.

Semi-intelligent devices measuring dynamic information-bearing body signals like the heartbeat and body temperature, monitoring the level of normalcy and real time streaming of relevant information to intelligent humans and to a database for quick and reliable reference along with a fool proof security system which allows only authorized persons to enter, conceptualizes an ICU that will set new standards in healthcare.

Intelligent intensive care unit is an environment created to match the standard which the above system is intended to achieve. The much-needed quick transfer of data and control signals between the various system components has to be wireless to result in an amicable and easily scalable environment. Hence Bluetooth turns out to be a natural solution to the problem.

## **SUMMARY**

Through this, it is shown how Bluetooth can be used to manage as critical applications such as an ICU. It is these in situations, where Bluetooth stands out as a necessity, not as a luxury, that the real power of Bluetooth is really exploited. We sincerely hope that a commercial implementation of our project would make a hospital user-friendlier place.

In fact, the very broad foundations of our project, namely, to use a person involuntary action, which take place all the time, to bring comfort and uplift his or other people life can be used in many different ways. One immediate application that we could think of was a home application, in which devices such as television, air-conditioner, music system, etc. would identify the user and then play themselves according to his preferences set. Definitely, proximity detection plays a very big role in such an application, as in ours too.

After having gone through the entire development of this concept, we came across some really nice ideas. Some improvements possible we thought could be very useful were:

- (i) A proper track of the RSSI of a user could be kept so as to determine his intentions more completely (not only proximity detection, but intention detection).
- (ii) additional functionality could be built into the dynamic patient monitor to let a patient in distress call somebody for help through the ICU security and monitoring system

# LINE FOLLOWER

**COLLEGE:** M S RAMIAH INSTITUTE OF TECHNOLOGY, BANGALORE

**GUIDE:**

**COLLEGE STUDENTS:** ASHISH K K, MANU KUMAR S

**SCHOOL STUDENTS:**

## ABSTRACT

The idea is to develop a basic line follower robot. The concept is simple and universally tried and tested. However, it serves a major point to high-school students. The whole idea of Engineering is to develop application oriented end products, and through a line follower, various aspects like programming, robot mechanics, and the idea of a micro-controller can be introduced to the high-school students.

The basic idea, as of now, is to develop a primitive robot, and have a controller, through which the wheels are controlled for movement. Additionally, a light-sensing device can be used to identify a particular line/strip, and make the robot move, only if a particular condition is satisfied. Here, the objective is to follow a line.

## SUMMARY

To develop a practical application oriented line following robot, and in the process, highlight the presence of engineering aspects in everyday life and innovation.

# ALCOHOL DETECTION AND DRIVER VIGILANCE

**COLLEGE:** SAMBHRAM INSTITUTE OF TECHNOLOGY, YELAHANKA

**GUIDE:** PROF.P. ANU THOMAS

**COLLEGE STUDENTS:** CHARUSMITHA V DESHPANDE, LALITHA S

**SCHOOL STUDENTS:** HEMACHANDRA DALVI S, ANJALI SINGH, SOUHARDA SCHOOL, YELAHANKA

## ABSTRACT

The aim of this project is to prevent the road accidents caused by drunken/sleeping drivers. Here we are capturing a number of images of the driver which are analysed using image processing techniques. Based on this analysis of driver's facial image and eye position, the module will give an alert message to the driver. If the driver is judged to be drunk or sleeping from his images, then the module will shut down the engine of the vehicle, thereby not allowing the driver to start the vehicle.

This project can be effectively modified to pass information to police control room or other safety

authorities and help them in reducing the number of road accidents. The total cost of the project is Rs.6000, which can be reduced to Rs.2500 by using a central server for communication.

### **BIBLIOGRAPHY:**

- 1) IEEE transactions on speech & audio processing, vol.7, Jan.1999.
- 2) IEEE transaction on power delivery, July 1996.
- 3) A vector quantisation approach to speaker recognition, AT & T technical journal, vol.66, April 1987.
- 4) www.bb-elec.com
- 5) www.lvr.com

### **SUMMARY:**

This project is automatic drunken/sleeping driver detection in real time to prevent road accidents. It detects the alertness of the driver by analysing his facial image, eye position and alcohol content in the air.

## **TABLET (TELEMETRIC ANIMAL BODY LENGTH ESTIMATION TECHNIQUE)**

**COLLEGE:** VIDYA VIKAS INSTITUTE OFSCIENCE & TECHNOLOGY, MYSORE

**GUIDE:** SUHAS, G NARAYANASWAMY

**COLLEGE STUDENTS:** ABHISHEK R, SRINATH K V, KOUSHIK N AITHAL, ASHUTOSH R

**SCHOOL STUDENTS:**

### **ABSTRACT:**

To determine body length of animals at motion

An image of animal is captured using high definition camera where parallel laser beam are taken as reference. Further using caed tools, length of animal are determined. In many bio-medical applications it becomes necessary to find the length of the animals. But it is difficult when animals are at motion and when they are ferocious. There is no technique available to do this as of now. Our method is one such tool.

Two lasers are mounted on t-shaped bar, one foot apart where a HD camera is placed in between them, laser beam are incident on an animal whose body length is to be found out. Image of it is captured. Using caed tools, a reference line is drawn to the image. Using ratio and proportion, animal length is found.

Using this technique an image of a cow which was 20 feet far was captured. The image was interfaced to software. The reference distance of lasers appeared to be 1cm apart while a reference line of animal body appeared to be 6.5cm in length. Therefore the length of cow was determined as 6.6feet. Length of ferocious animals and animals which are at motion can be determined easily from a far and safe distance.

### **SUMMARY:**

It is sometimes impossible to catch the ferocious animal/moving animal and to determine its length using measuring tape. Hence using this tablet (telemetric animal body length estimation technique) approximate length of the animal from a far and safe distance can be determined.

## **BORE WELL WATER LEVEL MONITORING AND MOTOR PROTECTION SYSTEM USING GSM MODEM**

**COLLEGE:** SIDDAGANGA INSTITUTE OF TECHNOLOGY, TUMKUR

**GUIDE:** Dr. K VISHWANATH

**COLLEGE STUDENTS:** GURUNATH REDDY M, SRIHARSHA K

**SCHOOL STUDENTS:**

### **INTRODUCTION:**

"India is an agriculture based country with farming and related activities constituting to a huge chunk of the GDP and employment. Even though the government has several initiatives for helping the farmers there isn't much the adoption of technology in that has happened over the years. Farming has been slow due to the infrastructure, learning curve and cost involved. With technological advancements, the mobile phone has become a multifunctional device. Its applications have gone beyond voice and data communication. In this document i would be describing design on *"bore well water level monitoring and motor protection system using GSM modem"*.

### **OBJECTIVE:**

Using mobile communication network (GSM) we can intimate the farmer about the depth of water level in the bore. If the water level in the bore well falls below a certain value then there is a chance of motor getting air locked or even tends to burnt off. To avoid such incidents this application is useful. The ground water level in India is depleting day by day. It is very difficult to predict the water level in the ground. So many motors get burnt or air locked due to this problem. The power supply is also very erratic in our country. It is very difficult for the farmers to get into

the field in nights and switch on/off their pumps. This design will help in solving the above said problem very effectively.

The 8 bit AT89C51 microcontroller is the main controlling part of the circuit; it is connected to the water sensor circuit, motor and GSM modem. The program is stored in microcontroller to take necessary actions. The water sensor circuit comprises of two water sensors dipped along with the bore well pipe, the sensors are connected to the water sensing circuit. S1 and S2 are two sensors which are dipped into bore well along with the bore well pipe as shown in the block diagram. S1 sensor is considered as threshold point and S2 is placed below the pipe. Whenever water level falls below the threshold reference i.e. sensor S1, the conducting path breaks (impure water is a conductor) between sensor S1 and S2 and hence we get a signal from sensor circuit to microcontroller, the microcontroller turns off the running motor and send a call to the farmers cell phone through GSM modem to indicate that the water level has come down a minimum level and hence the motor gets turnoff, in this way the motor gets protected from airlocks and tending to burnout, if water level is not up to the mark.

### **GSM Modem SIM300 V7.03**

GSM module is a specialized type of modem, which accepts a SIM card and operates over a subscription to a network operator, just like a cellular phone. Hence it is cell phone without display of its operations. Modem SIM300 is a Triband GSM/GPRS engine that works on frequencies EGSM 900 MHz, DCS 1800 MHz and PCS1900 MHz

GSM modem is RS232 logic level compatible i.e. it takes -3 to -15V as logic high and +3 to +15V has logic low. Hence MAX 232 is used in order to convert TTL to RS232 logic level and vice versa. MAX232 is a voltage level converter. It consists of buffers with some capacitors externally connected and hence maintains the same signal voltage at devices on the either side of it. Hence here, any received message at the modem is sent to  $\mu\text{C}$  through MAX232 Rx and receives the fetched details from  $\mu\text{C}$  at its Tx

### **SUMMARY:**

The project is working well, in this project we can turn on the motor remotely with the help of mobile phone, also the system informs the status of water level in the bore well to the farmer's mobile phone.

## **CELL PHONE OPERATED LAND ROVER**

**COLLEGE:** JAWAHARLAL NEHRU NATIONAL COLLEGE OF ENGINEERING, SHIMOGA

**GUIDE:** AMARAPPA S

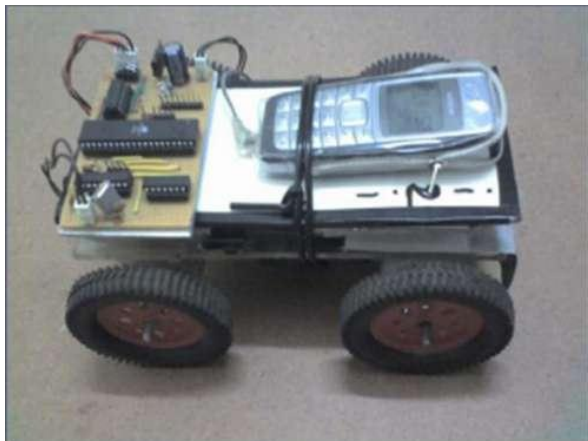
**COLLEGE STUDENTS:** AKSHATAHA K T, BINDIYA H V, SHRUTHI S

**SCHOOL STUDENTS:**

## **ABSTRACT:**

The basic idea of the project is total navigation of a rover wirelessly. This project comprises of a land rover (whose receiver is a cell phone) which can be operated anywhere in the world by another cell phone provided both the rover and user are in the same service provider network. Cell phone used here works on GSM technology. Moreover the rover as an enhancement that is a wireless camera attached so that it can give a clear vision of the vicinity around the rover, back to the user.

In this project, the robot is controlled by a mobile phone that makes a call to the mobile phone attached to the robot. In course of a call, if any button is pressed, a tone corresponding to the button pressed is heard at the other end of the call. This tone is called "DUAL TONE MULTIPLE-FREQUENCY" tone. The robot perceives this DTMF tone with the help of the phone stacked in the robot. The mobile that makes a call to the mobile phone attached to the robot act as a remote. So this project does not require the construction of receiver and transmitter units.



# **BRAIN AND COMPUTER INTERFACE FOR SAFE DRIVING**

**COLLEGE:** CHANNABASAVESHWARA INSTITUTE OF TECHNOLOGY, GUBBI

**GUIDE:** SUHAS K.C, BASAVARAJU

**COLLEGE STUDENTS:** SPURTHI G.R

**SCHOOL STUDENTS:** ADITYA, RAKSHITH GJC TUMKUR

## **ABSTRACT:**

### **OBJECTIVE**

Everyday .....many road accidents take the toll of many human lives. Out of which.... are accidents which occur at night and ..... many happen due to sleepy mood driving.

### **METHOD**

By analysing the EEG signals of the brain of the driver and warning them by alarm.

## **EXPERIMENT**

The common structure of a brain computer interface is as following:

- 1) Signal acquisition: the eeg signals are obtained from the brain through invasive or non-invasive methods (for example, electrodes). After, the signal is amplified and sampled.
- 2) Signal pre-processing: once the signals are acquired, it is necessary to clean them.
- 3) Signal classification: once the signals are cleaned, they will be processed and classified to find out which kind of mental task the subject is performing.
- 4) Computer interaction: once the signals are classified, they will be used by an appropriate algorithm for the development of a certain application.

## **CONCLUSION**

Road accidents at night times can be reduced to a large extent.

# **HOME AUTOMATION SYSTEM**

**COLLEGE:** PES INSTITUTE OF TECHNOLOGY, BANGALORE

**GUIDE:** NONE

**COLLEGE STUDENTS:** DEEPAK KARKI, ANANYA, ABHISHEK JAIN

**SCHOOL STUDENTS:** SIDDARTH, VARUN BALAJI, NATIONAL PUBLIC SCHOOL HSR LAYOUT

## **OBJECTIVE**

The aim of the project, as the name suggests is to control all (or at least most) of the electronic devices remotely (sitting anywhere in the world) just through your laptop or your smart phone. today's automation systems are extremely costly and are hence limited to the rich and first class of the society; our aim is to build a cheap version of the automation system so that the working middle class who forms the bulk of the society can better their lifestyle. Not only that well focused and smart use of these systems can help us save energy by switching off forgotten devices any time anywhere.

## **METHODS**

The project can be divided basically into two halves, the base module and the controller module. The base module consists of a computer with parallel ports. We know that parallel ports can be controlled using software program's [written in visual basic, c etc.]. Hence our first step was to write a program to control the parallel ports. In turn parallel ports can be used to control electronic components like LED's (i.e. digital control), we have extended this basic idea in our own manner, to control household devices using our program. For this extension to be possible, we made the following modifications: from the parallel ports we get a +5v output, this is amplified to

+12v using an amplifier relay board, the relays of the board are connected to a spike buster (power strip) with a 220v input. All devices to be controlled are plugged into the spike buster, which is in turn controlled by the parallel port based on our program. Hence we see that all a-c devices in the home can be controlled using the base module, as far as they are plugged into the spike buster. But now the question arises that how to control the devices remotely? This can be done using our controller module, which happens to be just a mobile or a laptop. The controller module links to the base module over the internet and accesses the software program that controls the parallel ports of the base. Hence remote control of the objects is complete.

## CONCLUSION

So the project link up is as follows: controller to base module to program to the parallel ports to amplifier relay to spike buster to devices.

## BIBLIOGRAPHY

The project has come up as a solution to problems faced by today's techies, bachelors and the travelling class. We extended all existing ideas such as control of LED's and remote desktop control to give it a more application based perspective. We have integrated random ideas in the most unusual way to achieve our goal of cheap and efficient version of the home automation systems. Being our own original modification to existing ideas there is no particular source for our project.

## SUMMARY:

The key highlights of our project are:

1. The cost: extremely cheap, considering that the people who require it already have a computer at home and a mobile in hand. The rest of the system can be setup for not more than Rs.2000/- compared to the ones costing 10 lacks in the market.
2. The simplicity: the project is really simple in design and concept. But yet the idea is most original and innovative.
3. Application: unlike readymade systems, once the person has the design in hand he can customize it to his liking.
4. DIY: the simplicity makes it a do it yourself kind of project where people can make their own at home. This is really good as it can help save electricity. not only that, it will encourage travellers to keep plants and even pets like fish at house, whose water and food requirements can be taken care by automation systems.

# CONTROLLER FREE GAMING USING DEPTH SENSOR

**COLLEGE:** B.V.BHOOMAREDDI COLLEGE OF ENGG & TECH, HUBLI.

**GUIDE:** DR. UMA MUDENAGUDI,

**COLLEGE STUDENTS:** GIRISH SHIRIGANNAVAR,PAVAN SHINDE,PRAMOD RAMDURG &AKSHAY HARTI

**SCHOOL STUDENTS:** ANAND M ULLAGADDI, RAMALINGESHWARA HIGH SCHOOL & AMRUTH B MUSARI ,CHETHAN PUBLIC SCHOOL, HUBLI.

## ABSTRACT

In this project, We have addressed the problem of interactive gaming using the depth sensor like KINECT. KINECT is a 3d depth sensor which gives the depth information of the scene with the help of its infrared ray projector and infrared camera, because of which the actions of user in three dimensions are possible to detect. KINECT sensor has got applications in human computer interaction, gaming field, natural user interfaces, and health care etc.

We acknowledge a naturalistic way of controlling a game which has made us to think about a new way of communicating with computers, unlike the traditional methods like keyboard, mouse, or joystick. Here we control the virtual world as we do in the physical world and the user feels as if he is inside the game i.e. in virtual gaming environment. KINECT sensor acts as the input device. The data of a user is taken from the sensor to get feature (key) points on the body of the user, which in turn constitute the skeleton, which is used to get avatar (character in the virtual world) into the system. The 3d motion of the avatar is analysed to determine the gestures that user uses to control the game. We use different open source software tools like OPENGL to render graphics, OPENNI for sensor data processing, cinema4d to create 3d models and gaming environment, OPENAL for sound effects and MS visual C++ ide. We demonstrate this new way of controlling through the soccer penalty shootout game and a car test driving game.

## SUMMARY

We have demonstrated a new way of gaming by designing a soccer penalty shootout game, ball game and a car test drive game.

# BIO ACTIVE COMPONENTS OF RHIZOPHORA SP

**COLLEGE:** SRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR

**GUIDE:** DR GOVIDAPPA M, MS SHWETA V. BHAT

**COLLEGE STUDENTS:** ANU M.S & BAVITHA

**SCHOOL STUDENTS:** SOMYASHREE K.C & VARSHINI.N, SHRIDEVI VIDYA MANDIRA, TUMKUR.

## ABSTRACT

Rhizophorine is an alkaloid. The present investigation is aim to isolate an alkaloid. Rhizophorine from two species of Rhizophora we will use different parts for isolation of alkaloid using different methods. partial purification will be done by different method. Primary phytochemical analysis will be done for all plant extracts. Biophysical characterisation will be done for target alkaloid to know their structure by HPLC, GC, NMR, X-Ray Crystallography etc. The alkaloid will be evaluated against cancer cell lines to known more molecular mechanism by various methods such as cytotoxicity, DNA ladder, tunnel method etc. The literature survey showing that reveals that their no works of isolation, characterisation, and anticancer activity of rhizophorine alkliods. The present will prove the mechanism of anticancer activity of alkaloid from rhizophora sp.

## SUMMARY

We identify most potent anticancer alkaloid from two different species of rhizophara that can be used as another alternative drug for cancer treatment. All natural products doesn't have any side effects.

# INDUCTION OF SYGMATIC RESISTANCE OF OKRA WITH OXYSPORUM WITH BIOCIDES

**COLLEGE:** SRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR

**GUIDE:** DR.M.GOVINDAPPA

**COLLEGE STUDENTS:** SANGEETHA M,SANMATHI K,VINAY G P &FAREED CHOWDARY

**SCHOOL STUDENTS:** VIDYASHREE H P & DEEKSHITHA R

## ABSTRACT

Okra wilt is sever disease in tumkur district of karnataka and it cause yield loss. Present investigation is aim to find out a suitable remedial measure to control the disease with bio control agent environment. We will isolate different types of soil of okra in tumkur district we will screen all bio control agent against target, pathogen fusarium oxysporum in invitro condition promised bio control agent will try against the target disease under green house conditions to know the mechanism of disease control by bio-control agent we analyse the induction of resistance in the host plant by knowing the defence enzyme concentration, it will proves how the bio control agent

suppress the pathogen establishment in contracting the disease.

## **SUMMARY**

Okra wilt is severe disease in tumkur dist of Karnataka and it cause yield loss. Our aim is to find out a suitable remedial measure to control the disease with bio control agent.

# **PORTABLE SPECTROPHOTOMETER FOR ANALYSING THE PURITY OF DRINKING WATER USING DYE REDUCTION TEST (FOR DETERMINATION OF TOTAL MICROBIAL CONCENTRATION)**

**COLLEGE:** SIR M VISVESVARAYA INSTITUTE OF TECHNOLOGY

**GUIDE:** DR. H G NAGENDRA, PROF AND HEAD, DEPT OF BIOTECHNOLOGY

**COLLEGE STUDENTS:** NITISH SATHYANARAYANAN, JANANI C, SHREYAS UDUPI & ABHISHEK S V

**SCHOOL STUDENTS:**

## **ABSTRACT**

Waterborne diseases are caused by pathogenic microorganisms that are most commonly transmitted in contaminated fresh water used for drinking and cooking. According to the world health organization, it accounts for an estimated 4.1% of the total daly (disability-adjusted life year) global burden of disease, causing about 1.8 million human deaths annually. The world health organization estimates that 88% of that burden is attributable to unsafe water supply, sanitation and hygiene, and it mainly affects children in developing countries.

Though there are various instruments and protocols available for checking the purity of drinking water, there is a greater need to develop a cost effective, accurate, and portable (which works on battery power) and a device which could be used by the common man to assess the quality of drinking water on a daily basis.

## **METHODS**

The methylene blue reduction test (MBRT) or resazurin dye reduction test is based on the fact that the colour is imparted to water upon addition of a the dye the removal of the oxygen from water and the formation of reducing substances during bacterial metabolism causes the colour to disappear. The disappearance of the colour is dependent of the on number of microorganisms. The agencies responsible for the oxygen consumption are the bacteria. Though certain species of bacteria have considerably more influence than others, it is generally assumed that the greater

the number of bacteria, the quicker will the oxygen be consumed, and in turn the sooner will the colour disappear. Thus, the time of reduction is taken as a measure of the number of organisms in the given sample, although actually it is likely that it is more truly a measure of the total metabolic reactions proceeding at the cell surface of the bacteria. The quantification of the colour can be done through measuring optical absorbance of the dye at specific wavelength with the help of a colorimeter or spectrophotometer to assess the concentration of microbes indirectly. The biomass estimation (without dye) of microbes can be done at 560 nm and the optimal absorbance of methylene blue is between 609 to 660 nm while resazurin is between 570 to 600 nm. The spectrophotometer can be used to determine the absorbance.

Though there are numerous portable high precision devices available from reputed brands like konica-minolta, these devices are often expensive due to various facilities it offers. Thus, there is a need to develop a cost effective portable spectrophotometer.

## PRINCIPAL, CONSTRUCTION AND WORKING OF A PORTABLE SPECTROPHOTOMETER

### **PRINCIPLE**

The amount of light passing through the medium is obtained by beer-lamberts law.

The law states that there is a logarithmic dependence between the transmission (or transmissivity),  $t$ , of light through a substance and the product of the absorption coefficient of the substance,  $\hat{\epsilon}$ , and the distance the light travels through the material (i.e., the path length),  $\hat{a}$ . The transmission (or transmissivity) is expressed in terms of an absorbance. A simplified version can be given by the equation. Hence we can calculate the absorbance if we can find the absorption coefficient of the substance ( $\hat{\epsilon}$ ), and the distance the light travels through the material ( $\hat{a}$ ).

The distance travelled through the medium ( $\hat{a}$ ) can be designed as required, absorption coefficient of the substance ( $\hat{\epsilon}$ ) can be calculated or obtained by the using microcontroller.

### **CONSTRUCTION**

The basic block diagram is as shown in the figure. Infrared LEDs are used for the detection; it is made to pass through the test sample. IF photo diode accepts the transmitted light and converts it into equivalent electrical signal, this is given to the amplifier to amplify the signal and this signal is measured using measuring instruments. The measurement can be done using a voltmeter or a better method is to use microcontroller to take the values and calculate the absorption value as obtained in a standard spectrophotometer.

## WORKING

The value of  $\hat{\mu}$  (stated in the equation) is not calculated but it is compared to a standard value which is obtained under an actual spectrophotometer and stored in the microcontroller.

1. Firstly the voltmeter is connected as the measuring device, several numbers of samples are taken and they are tested using a standard spectrophotometer available in the labs. These samples are also measured using this device and the corresponding voltmeter reading is noted down in a tabular column. The number of samples determine the accuracy of the device, hence more number of samples help in increasing the accuracy.
2. The experimentally determined values are fed to the microcontroller and stored in the memory, this information is later used to compare the obtained value with the standard value and display the result using a LCD or LED display.
3. The voltmeter is replaced by the microcontroller and the sample is placed in the test area. The reading obtained at the input terminal of the microcontroller is compared with the standard value stored in the memory to obtain the value of  $\hat{\mu}$ .

## HYPOTHESIS

The dye reduction test and subsequent determination of spectral absorbance gives a gross concentration of the concentration of microorganisms, which can be used to assess the purity of drinking water on a daily basis even by a common man.

## ADVANTAGES

The kit also has advantages like

1. Cost effective - a handmade device expected to cost between 300-500 INR but the cost can be considerably brought down by automation.
2. Portable which generally uses 9v dawns from battery
3. Less weight in the size of a pen
4. Use of micro controllers increases the accuracy.
5. Ease of operation.

## LIMITATIONS

The methodology cannot distinguish between different types of pathogens and also un harmful microorganisms.

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## SUMMARY

This methodology is a cost effective, accurate and can be used by a common man for determination of purity of drinking water.

# DEVELOPMENT OF SOFTWARE APPLICATION THROUGH ARCHITECTURAL CORRECTIONS FOR ON-LINE APPOINTMENT OF DOCTORS TO PROVIDE EFFECTIVE HEALTHCARE TO RURAL POPULATION OF TUMKUR DISTRICT.

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**GUIDE:** SRI. LOKESH.S & DR.G.PANDURANGA MURTHY

**COLLEGE STUDENTS:** SAI PRASAD.B, VARUN.N, LINGRAJ KRISHNA .S.M & MANNAN JOHAR

**SCHOOL STUDENTS:** PREETHAM .M & MANNAN JOHAR.

## ABSTRACT

1. To develop appropriate software application based on the database obtained during interaction programs at identified regions of tumkur district.
2. To evaluate the existing software for their performance towards fulfilment of needs for people of project area.
3. To reduce the delay of getting appointment with the doctors and better service.
  - a) Complete information regarding the patient is maintained.

- b) Complete information regarding the appointment is maintained.
- c) Complete awareness of the patient to the doctor.
- 4. To make rural people aware of medical services provided by the government more easily.
- 5. To know all health care centres providing services properly by the government as per the standard especially to give rural people more flexible way to get appointment with doctors.
- 6. To evaluate modified software application for its efficiency towards providing effective health care facilities and information through this technology.
- 7. The modified software architecture will be recommended for implementation for other regions of the state/country.

## SUMMARY

An efficient, appropriate and flexible software application along with ease of use tools, more flexibility will be developed for providing effective health care facilities through this modified/ revised technology for rural people (especially, women and children) to get doctor's appointment in all health care centres.

- a) All the information regarding the services provided health care centers are available to rural people.
- b) Rural people can easily get appointment with doctors using simple sms or telephone call.
- c) Rural people can get immediate service in case of emergency.
- d) To reduce the time delays to get appointment with the doctors besides, this modified software technology will definitely help to save lives of the patients in villages by providing prior information to doctors about the patient, so that the doctor is available in time to serve the society.

## ADAPTIVE LIGHTING SYSTEM FOR AUTOMOBILES

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**GUIDE:** PROF. ANIL KADLE.

**COLLEGE STUDENTS:** THAMEEMUL RAHMAN.M & ABDUL AZEEZ.

**SCHOOL STUDENTS:** AHAMAD DAYAB KASIMJI & MOHAMMAD MUFIZ ANJUMAN SCHOOL.

## ABSTRACT

Adaptive lighting system for automobiles needs no manual operation of switching high beam and low beam when there is vehicle coming from front at night. It detects itself whether there is a light from front coming vehicle or not. Do the switching operation automatically. When there is high

beam from front coming vehicle, it automatically switches to the low beam and when the vehicle passes it automatically switch back to high beam. The sensitiveness of the adaptive lighting system depends upon the sensor used.

In our project we have used four led for indication/representing the high beam and low beam. The off condition of led represents the high beam; on condition of led represent the low beam.

## COMPONENTS

1. LDR
2. RESISTOR
3. ZENER DIODE
4. LED
5. RELAY
6. HEADLIGHT BULB
7. ATMEGA8 MICROCONTROLLER
8. MICROCONTROLLER KIT

## PRINCIPLE OF OPERATION (UNDER OPPOSITE LIGHT)

LDR senses the opposite vehicles light in the following condition.

- **In high beam condition:** the vehicle headlight flashes two times. The vehicle headlight is made to low beam.
- **In low beam condition:** the vehicle headlight keeps in low beam itself.
- **In dark condition:** the vehicle headlight is now made to high beam.

## TEST CONDITION OF ADC

### FULL DARK:

~ VOLTAGE 4.89 01      VOLTAGE 1000.494

### LOW BEAM:

~ VOLTAGE 3.9 01      VOLTAGE 797.94

### HIGH BEAM:

~ VOLTAGE 2.5 01      VOLTAGE 511.5

## ADVANTAGES

- High reliable good performance
- Less expensive
- Low power consumption
- Safe driving
- Provide good vision for vehicle drivers.

## **SUMMARY**

In the modern world vehicles are coming with well-tuned, but even driving at night time is difficult because of low vision due to the opposite vehicle headlight. So the adaptive lighting system will be efficient for vehicle. And we can expect a good vision also due to this adaptive lighting system.

# **ZIGBEE BASED REMOTE MAINTENANCE SYSTEM**

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**GUIDE:** Mr. SHIVUKUMAR B.E., M.TECH

**COLLEGE STUDENTS:** KIRAN KUMAR D V, RANGANATH B S, CHETHAN BASAVRAJ H G & SRIDHAR P G

**SCHOOL STUDENTS:** KEERTHI KUMAR D V & ABHISHEK

## **ABSTRACT**

In this present work, a substation is automated using GSM technology. Here an electric circuit model is designed to detect critical conditions in substation such as under voltage, over voltage, short circuit in the receiving side of the substation transformer and also temperature rise in the winding of substation transformer. An arrangement is also made to send message to an authenticated person by using GSM technology. When above said conditions are detected.

The critical model consists of two bulbs which are considered as two substation transformer. A microcontroller is used to detect critical conditions and GSM modem is connected to microcontroller for communicating with authenticated person.

## **INTRODUCTION**

A substation is a part of an electrical generation, transmission, and distribution system, where voltage is transformed from high to low, or the reverse and power is transformed without altering its frequency. Electric power may flow through several substations between generating plant and consumer, and may be changed in voltage in several steps.

A substation that has a step-up transformer increases the voltage while decreasing the current, while a step-down transformer decreases the voltage while increasing the current for domestic and commercial distribution. The word substation comes from the days before the distribution

system became a grid. The first substations were connected to only one power station where the generators were housed, and were subsidiaries of that power station.

Automation is the use of control systems and information technologies to reduce the need for human work in the production of goods and services. In the scope of industrialization, automation is a step beyond mechanization. Whereas mechanization provided human operators with machinery to assist them with the muscular requirements of work, automation greatly decreases the need for human sensory and mental requirements as well. Automation plays an increasingly important role in the world economy and in daily experience.

Monitoring has generally been applied to specific and individual pieces of substation equipment rather than as complete substation monitoring systems. This document and the references attempt to show a greater benefit from using a value based, risk management logic to select monitoring appropriate for the specific circumstances and based on sound engineering and economic judgment. Principles described can be used for the selection of monitoring for components or equipment on power systems as well as in numerous other situations.

This contribution shows how the link between failures causes and required monitoring can be developed. It shows how the risks associated with equipment functional failure can be quantified and how monitoring can be shown to be of economic value if applied appropriately. Monitoring can be used for many purposes. The most obvious is to determine the condition of the equipment. Recognize that monitoring can take many forms including manual inspections; continuous monitoring with a change in status/condition, periodic automated monitoring.

Monitoring should be applied when a cost/benefit value results from its use over alternatives without monitoring. Monitoring can provide benefits in at least the following areas, each of which should be considered in the evaluation. Inclusion of all existing visible or intangible costs and all expected benefits allows for a more accurate assessment of the value of monitoring.

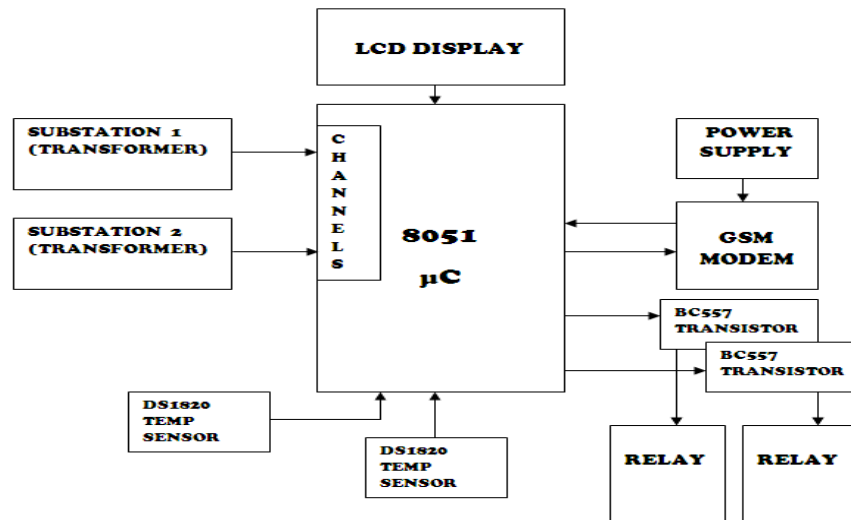
It is useful to monitor the voltage, current & temperature from respective suitable transducers from various points. The analog signals received/generated are then fed to the ADC unit filtering and signal conversion. The data received is digitized and the information about critical conditions such as under voltage, over voltage, short circuit and temperature should be sent to the preferred person from the GSM. In these ways the proposed substation monitoring system prove helpful to monitor & safeguard the electrical systems.

Moreover this is equipped with under voltage, over voltage & temperature sensors. So when ever these conditions are detected, it automatically terminates the power to the output. Hence protecting the load is also equipped with fine/temp detectors/hence protecting the expensive power transistors.

In the present work, a substation is automated using GSM technology. Here an electric circuit model is designed to detect critical conditions in the substation such as under voltage, over

voltage, short circuit in the receiving side of the substation transformer and also temperature rise in the winding of the transformer. An arrangement is also made to send message to an authenticated person by using GSM technology when the above critical conditions are detected.

## Block Diagram



## Working Principle

Here we are taking the input power from the two substations (bulbs) that act as transformers. The outputs from the transformers are connected to the adc channels of the controller to get the exact digital output. Temperature sensors are also connected to sense the under voltage, over voltage, short circuit and temperature. The outputs of the specified pins of the controller board are connected to two relays that consist of transistors called BC 557 which acts as a booster. At last we get the desired ac voltage from the relays. The status of the output is sent to the preferred person from the GSM modem.

## Components Used

1. Transformer.
2. 8051 microcontroller board with ADC.
3. GSM modem.
4. BC557 Transistor.
5. SPDT (single pole double through) Relay(2 in numbers).
6. LCD (16×2).
7. 2 Temperature sensors (DS1820).

## Conclusion

Understanding the condition of substation power equipment has an inherent value based on preventing failure, maximizing future operation of the equipment, appropriately scheduling and determining the extent of inspections and maintenance, providing for personnel safety and protecting the environment. Monitoring has a net value based on the differential between all costs and all benefits. On-line condition monitoring can be an effective, economic and efficient means of gaining the required understanding of equipment condition if the appropriate combination of parameters to be monitored.

In the present work an attempt is made to monitor some of the critical conditions of the substation such as under voltage, over voltage, short circuit and temperature rise by designing an electronic circuit model. This work can also be implemented for practical substation.

The challenge is to gather the combined talents of equipment manufacturers, users of equipment, and manufacturers of monitoring devices and “systems integrators” to develop seamless, automated, delivery of operating and equipment condition information in an effective, efficient and economic manner.

## Issues and Benefits

Application issue	Application Benefits & Advantages
Operational status	<ul style="list-style-type: none"><li>▪ Determine operational ability of equipment</li><li>▪ Determine operational status of equipment</li></ul>
Failure prevention	<ul style="list-style-type: none"><li>▪ Evaluate condition of equipment, detect abnormal conditions and initiate action to prevent impending failure</li></ul>
Maintenance support	<ul style="list-style-type: none"><li>▪ Evaluate condition of equipment and initiate maintenance only when degraded condition requires maintenance</li><li>▪ Assist with maintenance planning</li><li>▪ Judge condition of a larger population of similar/identical equipment</li></ul>
Life assessment	<ul style="list-style-type: none"><li>▪ Evaluate condition of equipment to determine anticipated remaining life</li><li>▪ Detect abnormal conditions</li></ul>

Optimize operation	<ul style="list-style-type: none"> <li>▪ Evaluate functional condition of equipment while extending or maximizing duties imposed on equipment</li> <li>▪ Control the effects of loading regardless of equipment condition</li> <li>▪ Optimize operation of equipment on system</li> </ul>
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Commissioning verification tests	<ul style="list-style-type: none"> <li>▪ Confirm correct installation conditions and adjustments</li> <li>▪ Evaluate condition of equipment and improve effectiveness and efficiency of verification testing</li> <li>▪ Automate collection and preservation of baseline condition data and characteristics</li> </ul>
Failure analysis	<ul style="list-style-type: none"> <li>▪ Provide information on prior condition of equipment after a failure has occurred</li> </ul>
Personnel safety	<ul style="list-style-type: none"> <li>▪ Prevent unsafe conditions to personnel</li> </ul>
Environment safety	<ul style="list-style-type: none"> <li>▪ Prevent unsafe conditions to environment</li> </ul>

## PLC BASED MIXING AND FILLING SYSTEM

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**GUIDE:** Mr. ANUP KIRAN (M.TECH)

**COLLEGE STUDENTS:** SRIRAM BISHNOI, SRINIDHI B C, SANJEEV KUMAR S & AMRUTHA M A

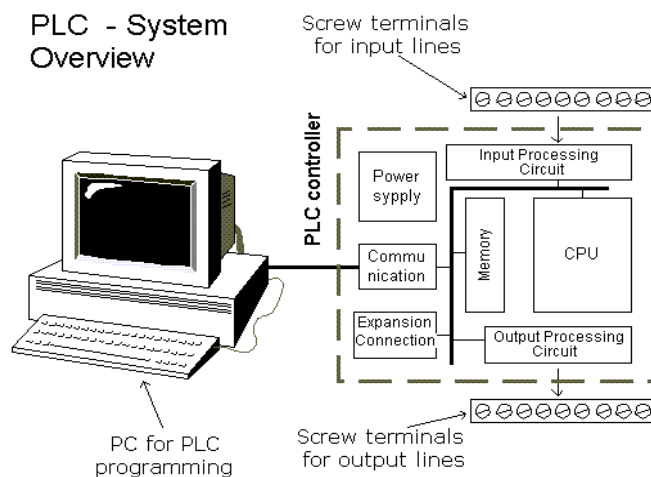
**SCHOOL STUDENTS:** DHEEMANTH J PATEL & SHRAVAN

### ABSTRACT

In this project, a discussion about PLC application will be explained in more detail with its specifications. Whereby, a machine that used to prepare automatic filling water into the bottle is fully controlled by the PLC ZEN, which acts as the heart of the system. The system sequence of operation is designed by ladder diagram and the programming of this project by using ZEN support software. Sensor usually plays its vital part as an input signal transmitter for the PLC in this system. During this project, sensor has been used to detect the bottle position that move along the conveyor belt at the low speed while the machine operates. The input signal that has been sent from the sensor to the PLC has being made as a reference signal. In order to determine the output signal that is exactly same as the PLC programming language based on the user requirement. Besides that, the electronics and electric devices that usually been controlled by the

PLC are like a synchronous motor, stepper motor, sensor, conveyor belt, buzzer and the others devices.

## PROGRAMABLE LOGIC CONTROLLER



**Figure 1.0**

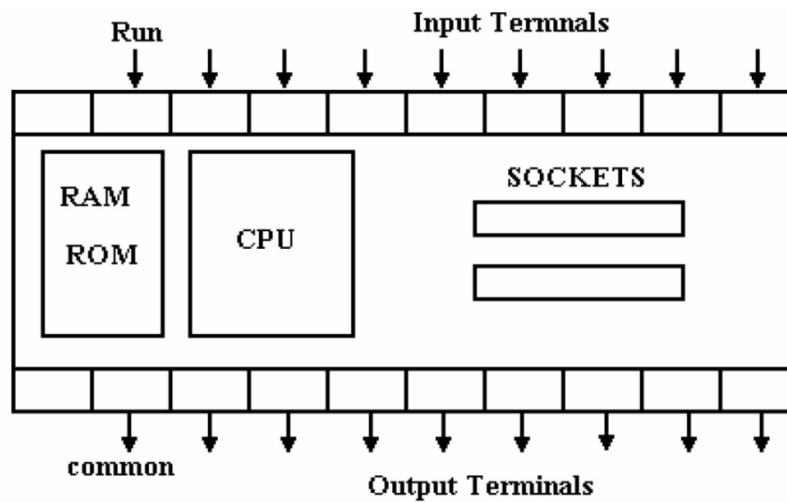
PLC is a digitally operating device which uses programmable memory for internal storage of instruction for implementing specific function such as logic sequencing, timing, counting and arithmetic to control through digital or analog input/output modules.

### ADVANTAGES

- Cost effective for controlling complex systems
- Flexible and can be re-applied to control other systems quickly and easily
- Computational abilities allow more sophisticated control
- Troubleshooting aid makes programming easier and reduce downtime
- Provides reliability to input/output components
- Compact in size
- Low power consumption

### ARCHITECTURE & TERMINOLOGY

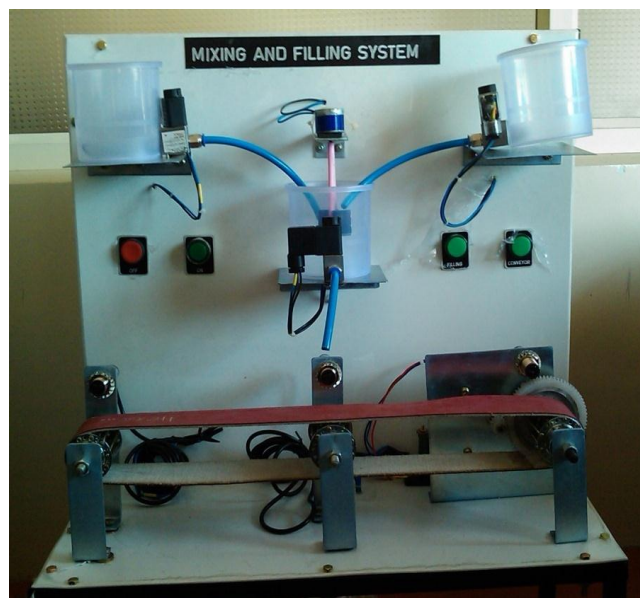
The PLC activates its output terminals in order to switch things on or off. The decision to activate an output is based on the status of the system's feedback sensors and these are connected to the input terminals of the PLC. The decision is based on logic programs stored in the RAM and/or ROM memory. They have a central processing unit (CPU), data bus and address bus. A typical unitary PLC is shown below.



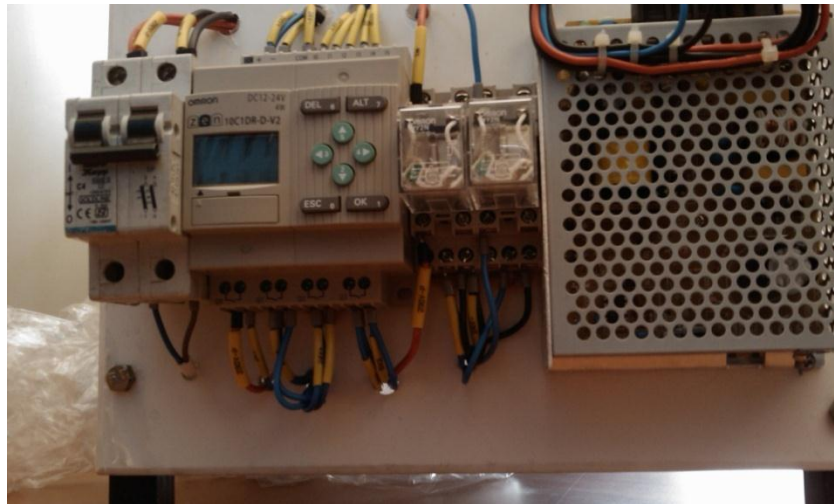
**Figure 3.1**

The next diagram shows a very oversimplified diagram of the structure. The Central processing Unit controls everything according to a program stored in the memory (RAM or ROM). Everything is interconnected by two busses, the address bus and the data bus (shown as a single red line). The system must be able to communicate with external devices such as programmers, display monitors and Analogue/Digital converters.

**OVERALL MODEL**



**Figure 4.2 - FRONT VIEW OF THE MODEL**



**Figure 4.3 - SIDE VIEW OF THE PLC AND POWER SETUP**

## FUNCTION AND CONFIGURATION

### PLC

ZEN 10C1DR-D-V2 model PLC is employed

12-24v DC input, 5 W, 0.5Amps Output,

Output – relay type

6 inputs & 4 outputs (10 I/O)



### **OMRON MAKE**

PLC is a device that was invented to replace necessary sequential relay circuit for machine control. The PLC works by looking at its inputs and depending upon their state, turning ON/OFF output the user enters a program, usually via software that gives the desired result.

### **POWER SUPPLY**

220 AC, 0.6A- INPUT

24DC, 2.1A – OUTPUT



Power supply is a SMPS that provides variable regulated voltage. This SMPS can operate at even 30 volts DC output.

With the input of 230 volts AC they provide 24 volts DC supply. This 24 volts is used to operate PLC, valves, switches, relays, sensors.

## RELAY

220v AC to motor,

220v AC, 2.1 Amps output

## OMRON MAKE



A relay is an electrical switch that opens and closes under the control of another electrical circuit. This switch is operated by electromagnet to open and close one or many set of contacts. The electromagnetic coil consists of multi-turn coil, wound on an iron core to form an electromagnet. When the coil is energized by passing current through it, the core becomes temporarily magnetized. The magnetized core attracts the iron armature. The armature is pivoted which causes it to operate one or more set of contacts. When the coil is de-energized the armature and contacts are released. The coil can be energized from a low power source such as transistor while the contacts can switch high power such as the main supply.

## SOLENOID VALVES

Pressure 0~10 MPa, 24 V DC

Power - 4.8 Watts



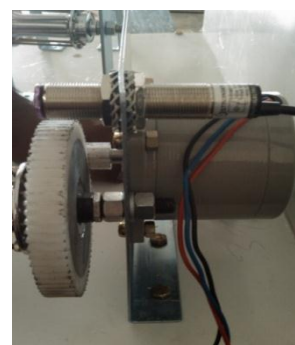
Solenoid valves are used to control the flow of liquids from the tanks. These are directly connected to the PLC and operate according to the delay to switch ON/OFF or open/close as per the program.

## SYNCHROUS MOTOR

Input 230 V, single phase, 50 Hz

Speed - 60 rpm, line amps < 0.12 A

Torque – 3.5 kg-cm



## **ALL-STEP MAKE**

A revolving field can be produced in synchronous motors from a single-phase source by use of the same method as for single-phase induction motors. With the main stator winding connected directly to the supply, an auxiliary winding may be connected through a capacitor.

## **DC MOTOR**

12 Volts DC motor, 300 RPM



A 12 volts toy DC motor is used in this process for purpose of mixing the two liquids flowing from tank 1 and tank 3. The DC motor's shaft is connected to a fan like structure which has a wing used for optimum mixing. The DC motor is supplied with a 9 volt battery supply in order to reduce it speed and avoid splashing of water outside the mixing tank.

## **PHOTO ELECTRIC SENSORS**

10 – 30 Volts DC, 200 milli-amps

STRONGER MAKE

These are used to sense the empty bottle and send the signal to synchronous motor initially and then the conveyor moves until it is sensed by another sensor under the mixing tank, which sends the signal to tank 2 valve for filling process after which the conveyor moves again until it is stopped by the third sensor which completes one cycle of process.



## **MIXING**



In this process tank 1 valve opens for a certain period of time and the liquid flows in to the mixing tank (tank 2). After a delay of few seconds, valve of tank 3 opens and the liquid from tank 3 flows into the mixing tank. At the same time the DC motor starts the mixing process begins for a time as programmed in PLC.

## BOTTLE SENSING

Initially the bottle is sensed when the process begins but does not send the signal to synchronous motor due to a delay given in the program. After the mixing process is completed automatically a signal is sent from the sensor to conveyor to move towards filling process.

## BOTTLE FILLING

As soon as the bottle reaches the second sensor the conveyor motion comes to a halt and the filling process begins up to a time delay as programmed and after the filling process is completed, the conveyor moves the bottle and next bottle comes in for filling and process continues.

## CONVEYOR MOTION

The conveyor system consists of a belt which is mounted on three rims and is connected to the synchronous motor through gears in order to reduce the speed of the belt by a certain ratio as per the requirement.



## ADVANTAGES

- Even Broader Applications with Increased functionality and higher precision.
- Increased functionality in a compact body (70 mm wide × 90 mm high).
- Easy programming is available using the LCD and operation buttons.
- This single Unit easily provides relay, timer, counter, and time switch functions.
- Expansion is easy with Expansion I/O Units, allowing up to 44 I/O points.
- Economy-type and Communications-type CPU Units have been added to series.
- Select from two power supply options: 100 to 240 VAC or 12 to 24 VDC.

## APPLICATIONS

- In chemical industries.
- In cold drink industries for faster filling of bottle.
- In packaged water industries.
- Can be used in any industrial application which has the process of mixing two or more contents and filling it to containers.

## **CONCLUSION**

Due to many advantages of PLC over relay in the recent years there has been a rapid increase in the use of PLC for automation purpose. Mainly here, the tedious wire connection is reduced many times and bulky relay is replaced by the miniature PLC.

With the increase in number of inputs & outputs in the PLC, complex industrial processes consisting of many functions can be operated very easily with minimal effort in programming.

The employment of OMRON PLC has to our project has provided few advantages over the other conventional PLC.

OMRON PLC has reduced the use of relay module to required project with saving the space of the cabinet. Their output module is enhanced to 0.5 amps 5 watts, which of the other PLC are of 0.05 amps less than 5 watts.

The LCD panel on the OMRON PLC provides the clear status of the PLC program execution, input and output status condition. This facility becomes very important for a technician to trouble shoot easily and quickly.

# **STREET LIGHT CONTROLLER, EFFECTIVE POWER MANAGEMENT AND MINI ROBOT**

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**GUIDE:** MANJUNATH

**COLLEGE STUDENTS:** RAVICHANDRA & KUSHAL ARADHYA R

**SCHOOL STUDENTS:** SUBHAS & MANU

## **ABSTRACT**

1. To conserve the power in cities in order to direct the conserved power to the rural areas (or) for needy people
2. (a) Effective control of street lights  
(b) Control of input power to pc  
(c) lights inside shopping mall, etc..
3. Can be implemented from small buildings, homes to big shopping malls where the power conservation will be substantial
4. In conclusion by the application of effective power management an considerable amount of power can be conserved indirectly helping country in developing economically.

## SUMMARY

By bringing awareness among students, working professionals, common people...we can eventually bring the effective use of sources into practice.

# AUTOMATED MULTISTOREY CAR PARKING SYSTEM

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**GUIDE:**KAVERI K.B

**COLLEGE STUDENTS:** ROHINI.H.S,SHILPA.B.R & RANJITHA.P.

**SCHOOL STUDENTS:** KEERTHIKIRAN & GAGAN, SRI KRISHNA RAJENDRA BOYS GOVT COLLAGE K R NAGAR

## ABSTRACT

### OBJECTIVE

Efficient car parking system

### METHODS

**STEP1.** Detect the arrival using light sensors

**STEP2.** Generate an interrupt to micro controller

**STEP3.** Make interrupt service routine to call a procedure to locate free space in parking lot

**STEP4.** Generate another interrupt to call the lift

**STEP5.** Send the car to respective place

### HYPOTHESIS

This will help us to create a systematic and autonomous car parking system

### RESEARCH WORK CITED

[http://www.tatasteelconstruction.com/file\\_source/staticfiles/construction/library/steel%20frame%20car%20parks%20pdf.pdf](http://www.tatasteelconstruction.com/file_source/staticfiles/construction/library/steel%20frame%20car%20parks%20pdf.pdf)

### EXPERIMENT

1. Verify whether sensor is sensing properly
2. Verify whether interrupt is generated
3. Verify whether the lift is coming to take the car
4. Verify if slot is occupied and update the memory to reduce the number of free space

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- 6.[http://www.tatasteelconstruction.com/file\\_source/staticfiles/construction/library/steel%20framed%20car%20parks%20pdf.pdf](http://www.tatasteelconstruction.com/file_source/staticfiles/construction/library/steel%20framed%20car%20parks%20pdf.pdf)

## SUMMARY

Car arrival using light sensors is detected, Interrupt generated to micro controller, free space is allocated in parking lot by calling interrupt service routine and lift is called, car is sent to respective space.

# AUTO TRAFFIC SENSOR

**COLLEGE:** VIDYAVIKASA INSTITUTE OF ENGINEERING & TECHNOLOGY, MYSORE

**GUIDE:** KAVERI M A

**COLLEGE STUDENTS:** MEGHANA.R, PADMINI.P, NANDINI.B.B & BHAVYASHREE. M.V

**SCHOOL STUDENTS:** YOGESH & LINGRAJU, GHS VINAYAKA NAGAR, PADUVARAHALLI, MYSORE.

## ABSTRACT

### OBJECTIVE

To build up software this guides vehicle in traffic

### METHODS

1. Detect the obstacle in front of the vehicle by using infrared radiation sensors
2. Relative distance between vehicle and obstacle is measured while vehicle is moving.
3. At particular distance from obstacle called slow down distance, vehicle slows down its speed.
4. As distance further decrease, at deviation distance, vehicle gets deviate and start moving.
5. If it again faces an obstacle, it will stop.

## **HYPOTHESIS**

This will help to avoid accidents without human effort.

## **WORK SITED**

1. [http://www.societyofrobots.com/microcontroller\\_tutorial.shtml](http://www.societyofrobots.com/microcontroller_tutorial.shtml)
2. <http://www.8051projects.net/>
3. <http://science.howstuffworks.com/robot.htm>
4. <http://training.gov.au/trainingcomponentfiles/release>

## **EXPERIMENT**

1. Verify whether sensor is sensing the obstacle.
2. Verify whether vehicle is moving
3. Verify whether vehicle slow down at slow down distance
4. Verify whether vehicle take deviation in deviation distance.
5. Verify whether vehicle stop moving, if it faces obstacle a

## **BIBLIOGRAPHY**

1. [http://www.societyofrobots.com/microcontroller\\_tutorial.shtml](http://www.societyofrobots.com/microcontroller_tutorial.shtml)
2. <http://www.8051projects.net/>
3. <http://science.howstuffworks.com/robot.htm>
4. <http://training.gov.au/trainingcomponentfiles/release>

## **SUMMARY**

The project mainly aims at preventing accidents without human help and reducing human effort in transportation of goods.

# **EFFECTIVE WASTE DISPOSAL**

**COLLEGE:** NMAM INSTITUTE OF TECHNOLOGY, NITTE, UDUPI.

**GUIDE:** DR. MURALIDHAR R

**COLLEGE STUDENTS:** ASHUTOSH BHAT, SAGAR GOURISHANKAR KAMBLE.

**SCHOOL STUDENTS:** ASHWIN S BHAT, CALVIN J ARANHA & DEEKSHIT, BELAMANU GOVT SCHOOL

## **ABSTRACT**

### **OBJECTIVE**

Effective disposal of waste with the use of minimum resources (less man power)

## **METHODS**

1. We propose a concept of point-to-point collection of waste.
2. Where with the help of autonomous robots effective collection & segregation of waste is done by categorizing the waste according to bio-degradable or non-bio-degradable.

## **HYPOTHESIS**

Humans usually are not willing to interact with the waste produced, which results improper disposal of waste and its segregation. Due to this piles of waste is seen everywhere. This results in severe health problems among the community. This situation can be changed by involving machines (autonomous robots) which will replace humans and do the work more effectively.

## **SOLUTION**

1. Use of autonomous robots/machines to play a human\'s role in waste handling.
2. Improved quality of human life by not performing the undesirable jobs.
3. The robots will help us achieve flexibility & high productivity in the long run.
4. They can perform a given task with high accuracy and repeatability.
5. Couple these with a effective source of power, such as solar power where in solar panels could be used for providing a 24 hr. uninterrupted power supply.

## **RESEARCH WORK CITED**

1. Robotics workshop on line following robots
2. Tapping of non-conventional energy.

## **EXPERIMENT**

### **1. CENTRIFUGAL SEPARATOR**

This machine works on the principle of centrifugal forces which can be used to separate masses of different density. The waste is loaded into to the separator, the machine rotates at a high velocity due to which the mass with high density can be differentiated and removed. Same process is repeated for next mass. This method can be effectively used for separating metals of different density.

### **2. LINE FOLLOWING ROBOT**

The robot can be programmed to follow a predefined line based on the code. The code enables the sensors to follow a line i.e a white line on a black roads surface. This robot can be coded to stop at certain points, intervals to collect the waste from the garbage cans kept in front of the houses.

### 3. ROBOTIC ARM

This is fixed on top of the line following robot which can be coded to perform any given task like, lifting the bin and pouring the waste into the baggage provided, and placing the bin back to its original place.

#### **CONCLUSION**

Smart and effective disposal of waste, without human interaction with it. This ultimately results in hygienic surroundings, better standard of living.

#### **SUMMARY**

With the help of this project we are trying to introduce an effective method by which we can not only collect garbage, but also segregate it according to whether it's degradable or not mainly using robots.

## **SOLAR POWER AIR CRAFT**

**COLLEGE:** JAWAHARLAL NEHRU NATIONAL COLLEGE OF ENGINEERING.

**GUIDE:** ADITYA KUMAR MISHRA, SCIENTIST, DRDO, MINISTRY OF DEFENCE, GOVERNMENT OF INDIA.

**COLLEGE STUDENTS:** AMAN KUMAR CHOUDHARY, SABYASACHI CHOUDHURY , NAROTTAM KUMAR & NITESH KUMAR.

**SCHOOL STUDENTS:** SHAN & YOGESH, GHS DURGIGUDDI, SHIVMOGA.

#### **ABSTRACT**

Objective-design a aircraft which run on solar energy

#### **METHOD**

By using EPP carbon rod, and balsa aerodynamic shape is given.

By using electric motor and servo motor make the design able to fly.

#### **CONCLUSION**

Aircraft runs by utilizing the solar energy very efficiently.

#### **SUMMARY**

It is solar based aircraft which run by utilizing solar energy. This energy is converted into electrical energy by using solar cell .the power generated is used to run the air craft.

Basically a set of batteries will be charged for actual flight.

# LEG OPERATED WASHING MACHINE

**COLLEGE:** JAWAHARLAL NEHRU NATIONAL COLLEGE OF ENGINEERING

**GUIDE:** DR.L.K. SRIPATHI

**COLLEGE STUDENTS:** PAWAN KUMAR M.P, MANJUNATH.P.J & VIJAYARAJA B.G

**SCHOOL STUDENTS:**SHANKAR SHANNA V, RAMAKRISHNA VIDYANIKETHAN & VISHAK L S ARBINDO SCHOOL, SHIVMOGA.

## ABSTRACT

The proposed project deals with the conservation of electricity using leg operated washing machine. The device consists of a pedal to drive the machine. A belt drive is used to transfer the power from the pedal to shaft the shaft is connected to churning setup, basically it's a porous stainless steel cylinder where there is provision for water to enter into the cylinder and take part in washing process. The washing process is carried out in a closed stainless steel box, which also acts as water reservoir. Here the operator while using the machine can look into the box through a transparent window provided at one side. By this one can be able to judge when to and how much to change the water.

Once the operator is satisfied with the washing process, he can use it as a drier by draining the water out through the outlet. Driver needs more speed which can be given by changing the gear provided near the pedal.

Thus our device provides additional benefit of physical exercise and keeps the operator fit

## SUMMARY

To minimize the present time energy crisis

# LINE FOLLOWING ROBOT JACKS FOR LORRYS

**COLLEGE:** G M INSTITUTE OF TECHNOLOGY, DHAVANGERE.

**GUIDE:** SURESH BABHU S, RAGHURAM & HARSHA H M

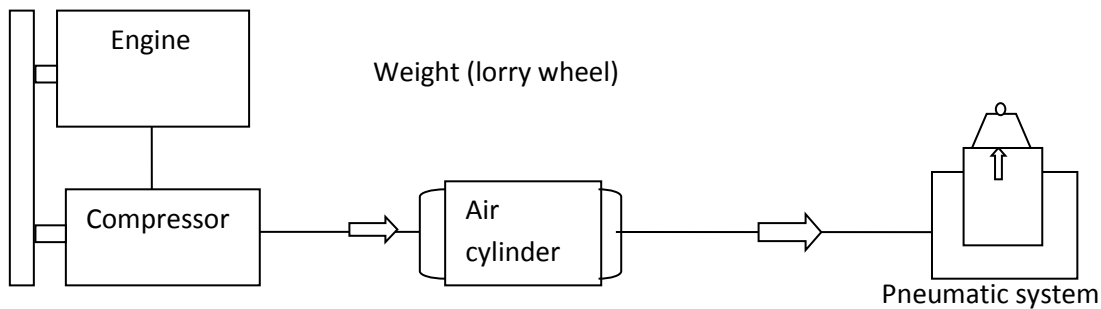
**COLLEGE STUDENTS:** PAWAN KUMAR M.P, MANJUNATH.P.J & VIJAYARAJA B.G

**SCHOOL STUDENTS:** RAKESH A R & MANOJ H R , TARALABAU CENTRAL SCHOOL.

## ABSTRACT

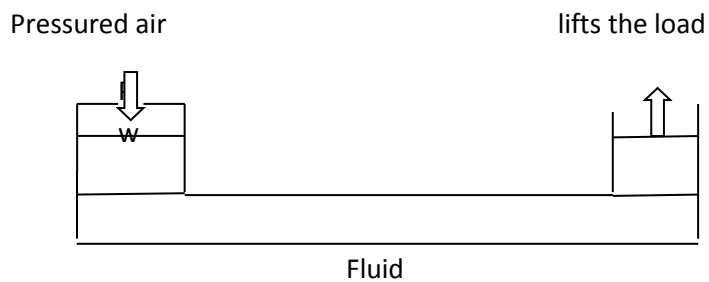
To reduce the manufacturing time ant transportation time

## Flow line of the Hybrid jack system



Here I'm planning to do a project on a jack for a lorry, using the same air produced by engine for air brake system

### PRINCIPLE USED IN THE HYBRID SYSTEM



### Objective

- To reduce the transportation time
- Easy to lift the heavy vehicles
- Reduce man power
- Proper Utilization of engine power
- Air filling for wheels using engine power

### SUMMARY

Automated flow line

# A SIX LEGGED, INTELLIGENT, MULTY PUPRPOSE WALKING ROBOT

**COLLEGE:** DAYANAND SAGAR ACADEMY OF TECHNOLOGY AND MANAGEMENT

**GUIDE:** DR. BHASKAR PAL

**COLLEGE STUDENTS:** PRASENJIT SINGH, AVINASH PARASMAL JAIN

**SCHOOL STUDENTS:** KARTHIK T & UDAY N, SIDDAGANGA MATT SCHOOL, BANGALORE

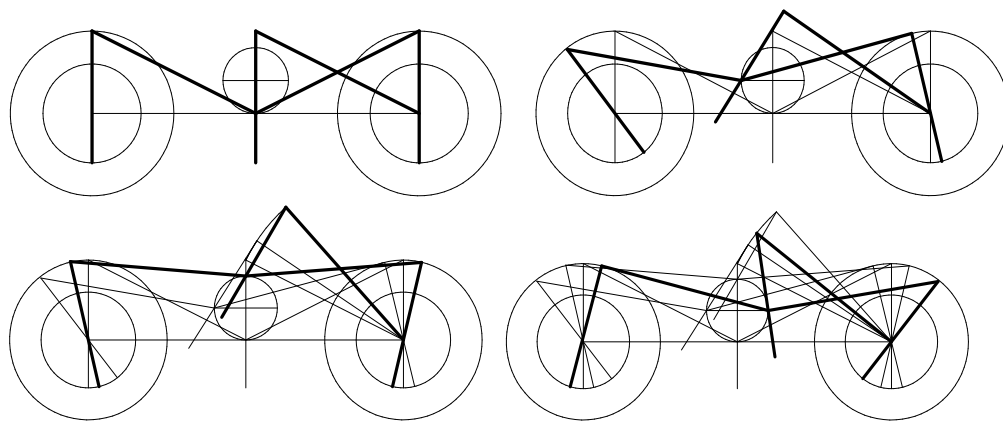
## OBJECTIVE

The project specification is to create an autonomous, 6 legged walking robot, which will try to help Physically Disabled People.

## METHODS

We looked to the oldest research aid known to man, nature. We found that often complex behaviour can fall out of the most basic instincts and that we could able to achieve a 6 legged autonomous creation using the some of the simplest components and concepts in electronics.

Synthesization of Links:



## HYPOTHESIS

Traditionally robots have been created which utilise wheels for locomotion; the humble wheel can provide fast and simple locomotion which can be easily setup and controlled. However in many real world situations where a robot may be required on uneven terrain, for example in earthquake disaster zones, the wheel fails to provide effective locomotion due to the limitation of vertical motion. It is for this reason that engineers have long sought to create effective robotic locomotion utilising legs.

## **RESEARCH WORK CITED**

Mobile robots have become more and more useful. They play dominant roles in remote and dangerous operations. For instance, two Mars Exploration Rovers, Spirit and Opportunity, have been performing missions on Mars since 2004 [1]. Although most mobile robots are wheeled robots due to their design and construction advantages, legged robots sometimes have benefits over the wheel robots especially on natural terrain. Leg mechanisms have evolved through natural selection so that animals can travel in any kind of terrain and access essentially any place on the earth's surface [2]. With a well-designed leg mechanism, legged robots could traverse unlevel and rough terrain more effectively than wheeled robots. Legged robots can jump or step over holes and small obstacles. They can turn around within a small space too. In addition, legged robots have fewer tendencies to damage the ground than wheeled robots [3]. On the other hand, legged robots require complex control algorithms particularly in gait selection and control. Each leg must continuously load and unload the weight within a short time [2]. Legged robots may also have some problems, for example, they can slip on wet surfaces, or one of their legs can get stuck in a hole [3]. In order to develop legged robots to operate in a dynamic environment, more research needs to be done. But the use of intelligent software such as cognitive architectures can help [4-8].

## **DATA**

### **FORWARD MOTION**

When both the motors rotate in the clockwise direction, the robot moves in the forward direction.

### **BACKWARD DIRECTION**

When both the motors move in anticlockwise direction the robot moves in backward direction.

### **LEFT TURN**

When the motor on the left side rotates in the anticlockwise direction and the motor on the right side rotates in the clockwise direction then the robot will take a left turn.

### **RIGHT TURN**

When the motor on the right side rotates in the anticlockwise direction and the motor on the left side rotates in the clockwise direction then the robot will take right turn.

### **Observations, Conclusion:**

When we embarked upon this project it was both an exciting and daunting prospect. The idea was quite unique and very ambitious. We knew from the start that a good sound design was critical for us to have any chance of achieving our goal and that a good source for research was imperative. So we looked to the oldest research aid known to man, nature. We found that often complex behaviour can fall out of the most basic instincts and that we could achieve a 6 legged autonomous creation using the some of the simplest components and concepts in electronics.

We split up the tasks between the team very early on and this helped us to achieve an excellent design very quickly. This meant that before we entered the work to start the build we could collate our research and data and add our own thoughts to each other's designs. When we finally entered the work the designs were realised very quickly and we were able to spend most of our time perfecting the mechanics of the robot.

The fact that we made all of the boards "plug and play" means that upgrading the robots behaviour and hardware will be quick and easy. It can now be used as a test bed for further research into instinctive behaviour. For example one more small modification to the existing circuit can easily be added to make the robot sense objects and reverse away.

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## **SUMMARY:**

All in all we are very happy with how the project has turned out and very proud of what we have achieved. It has been a great learning experience and an excellent stepping stone towards our solo project.

We are feeling great that we could able to impart intelligent and intellectual concept to the school children who could able to understand the complicated concepts very easily. This whole project is making lot of sense to us that not only the school children could able to deliver effectively but also it has given wonderful learning for the stepping stone to our future thinking

# DRIVER-FRIENDLY CAR HEADLIGHT SYSTEM

**COLLEGE:** SAMBHRAM INSTITUTE OF TECHNOLOGY, BANGALORE

**GUIDE:** PROF. M.V.CHAKRAPANI & DR. R.CHANDRASHEKAR

**COLLEGE STUDENTS:** VINOD KUMAR R & BHARATH KUMAR A.B.

**SCHOOL STUDENTS:** LAKHMISHREE P & BHARAT KUMAR P.

## ABSTRACT

### OBJECTIVE

To light the road ahead of the car in the steering direction.

### METHOD

By providing a swivelling headlight synchronised with the steering angle of the car.

### HYPOTHESIS

Accident possibility is reduced with improved visibility.

### RESEARCH

Two wheelers have headlights mounted on the handle bar and turn along with the handle bar into direction of the road curve. In a car, the headlights are fixed. The light beam does not get oriented properly during a turn. Though night driving constitutes only 25% of all driving, night time accidents account for 47% of all accidents. About 25% of road accidents occurring at night occur during turning. Providing headlamps aligned with steering wheel increases illumination in the turning direction thereby reducing the possibility of accidents by about one-third. High end auto manufacturers have incorporated expensive systems to orient light beams optimally in cars like bmw, audi etc.

### FABRICATION OF THE MODEL & EXPERIMENT

A model was designed & fabricated. The headlights were synchronised with the steering wheel using mechanics & electronics, and can swivel through a curve of 15 degrees at different speeds by mounting infra-red sensors, receivers, transmitter & the swivel able headlamps on the Ackerman steering gear in the model.

## DATA

The total cost of the model including bought out components is Rs.7000. If a minimum of 500 units is produced, the cost per unit would come down to Rs.2000.

## OBSERVATIONS

The system improves illumination by 300% in the direction of the road curve.

## CONCLUSION

Incorporating a system similar to the model designed & fabricated in existing cars, vans & trucks will reduce night time road accidents on road curves by about one-third.

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4. Mechatronics by Dan Neculescu, Pearson pub., 2007.

## SUMMARY

A working model car steering-cum-headlamp system has been designed & fabricated. In the model, the headlamps are synchronised with the steering wheel of the car & illuminate the road in the direction of turning. This low cost system can be incorporated in existing cars, vans & trucks at about rs.2000 per unit to improve road curve visibility & reduce night time accidents.

# WORKING MECHANISM OF ELECTROCHEMICAL MACHINING

**COLLEGE:** DON BOSCO INSTITUTE OF TECHNOLOGY

**GUIDE:** MR. SHIVANNA & PROF. GC VIJAYAKUMAR

**COLLEGE STUDENTS:** MOHAMMED NASRULLA BASHA, AADITHYA B S & ANTARANG KUMAR

**SCHOOL STUDENTS:** ZOHRA BANU V A & VINAY H S

## ABSTRACT

To demonstrate the working mechanism of electrochemical machining

Electrochemical machining (ECM) is a non-traditional method of machining conductive materials. It is based on the electrolysis process. The material removal takes place when electricity is passed through the tool and the work piece which act as electrodes and an electrolyte is made to flow between them.

## **METHOD/EXPERIMENT**

Performing the machining operation using model.

A model has been made based on the construction of actual ECM machine. The effort has been made in making the model work similar to the real machine. Though the model does the machining, it is not as fast or as efficient as the actual machine, but is sufficient enough to demonstrate the working mechanism of ECM.

## **OBSERVATIONS**

The material removal rate (MRR) is directly proportional to the current passing through the electrodes. The MRR also depends upon the flow rate of electrolyte and the standoff distance between tool and the work piece.

## **CONCLUSION**

The ECM process can be clearly explained using this model. It will act as a teaching tool for both engineering students and also to the school students as ECM is an application of electrolysis process that is thought in school level, and it also has its application in engineering field.

## **BIBLIOGRAPHY**

- \* Nonconventional machining by P K Mishra.
- \* Wikipedia
- \* [www.youtube.com](http://www.youtube.com)

## **SUMMARY**

ECM is a non-traditional method of machining conductive materials. The model can demonstrate the working mechanism of the ECM process by mocking the actual ECM machine. This model can be used as a teaching tool for both engineering and school students.