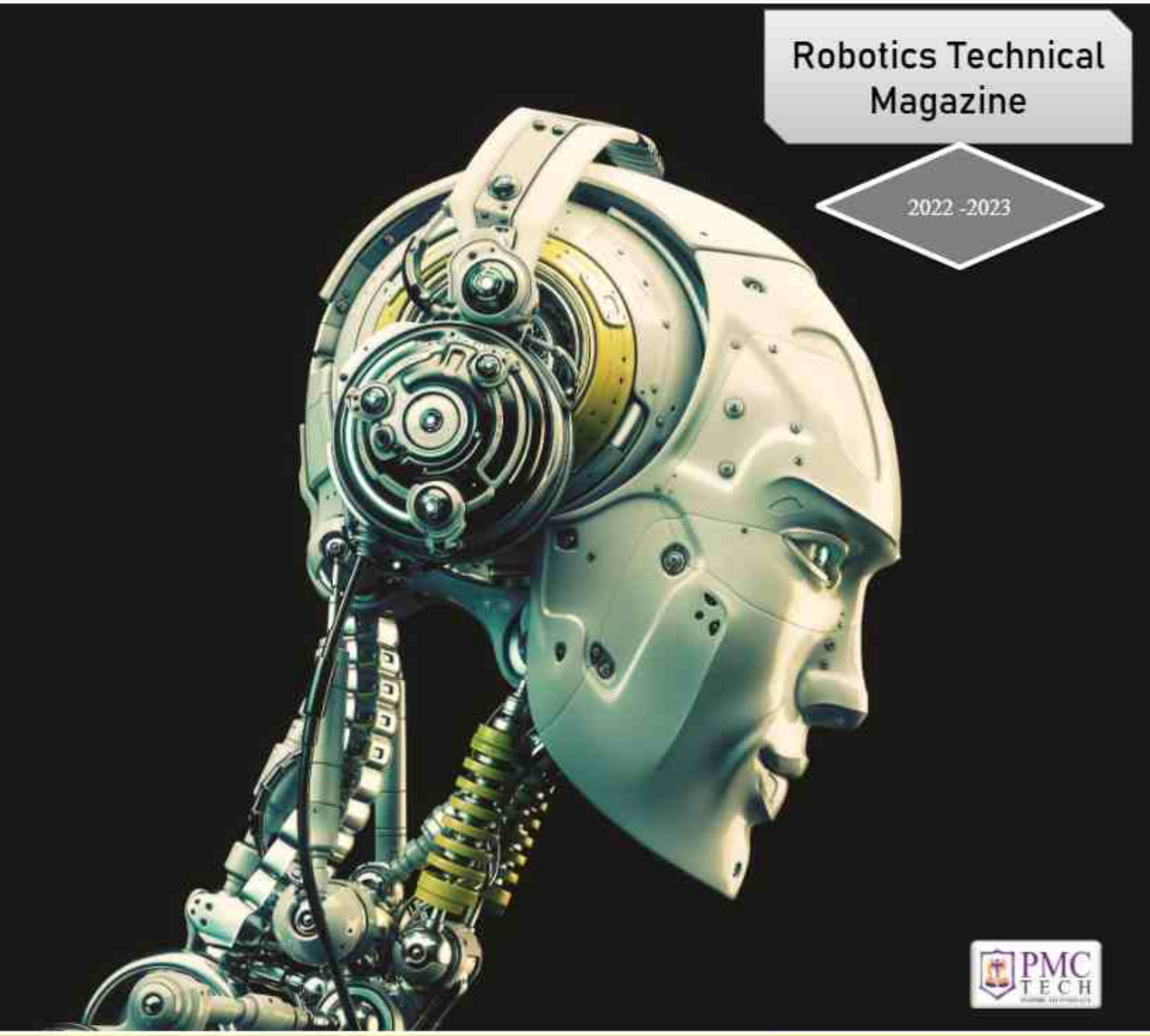
DON'T COMPROMISE



Robotics Technical Magazine

2022 -2023

PMC TECH

Er, PERUMAL MANIMEKALAI POLYTECHNIC COLLEGE

Koneripalli, Hosur -635117

AN ISO 9001:2015 CERTIFIED INSTITUTION, AFFILIATED TO TNDOTE

ACCREDIATED BY NBA

https://www.pmctechpoly.org

DEPARTMENT OF ELECTRONICS ROBOTICS ENGINEERING

DEPARTMENT OF ELECTRONICS ROBOTICS ENGINEERING

VISION OF THE INSTITUTE

"PMC Tech Polytechnic College shall emerge as a premier Institute for valued added technical education coupled with Innovation, Incubation, Ethics and Professional values".

MISSION OF THE INSTITUTION

To foster the professional competence through excellence in teaching and learning.

To nurture overall development of students by providing Quality Education & Training.

To provide innovative environment to learn, innovate and create new ideas for the betterment of oneself and society

VISION OF THE DEPARTMENT

To develop Electronics (Robotics) Engineering diploma holders to meet the growing needs of industry and society.

MISSION OF THE DEPARTMENT

To provide goal-oriented, quality-based and value-added education through state of art teaching & training method.

To provide Environment to promote practical knowledge on robotics to meet the needs of the industry and society.

To provide a platform to learn leadership, ethics and entrepreneurship experience among students for their sustained growth.

DEPARTMENT OF ELECTRONICS ROBOTICS ENGINEERING

Programme Educational Objectives (PEO's):

PEO 1: Core competence – exhibit the knowledge in Mathematics, science, fundamentals if Mechanical, Electrical, Electronics and Computer Engineering to solve Engineering problems in Robotics.
PEO 2: Breadth – design and create novel products and solutions for real life problems.
PEO 3: Professionalism: Exhibits professional and ethical attitude, effective communication skills and teamwork over multidisciplinary areas.
PEO 4: Higher students and employability – succeed in industry / technical profession by creating an environmental of excellence and a higher order of ethics and a zeal for life-long learning.

PROGRAM SPECIFIC OUTCOMES:

PSO 1: Ability to understand the integration of engineering applications such as electronic, mechanical, electromechanical, control and computer systems that contain software and hardware components including sensors, actuators and controllers.

PSO 2: Ability to exhibit the knowledge of electrical and electronics circuits, hydraulic & Pneumatic control system, logic design and image processing using hardware and soft programming for automation.

DEPARTMENT OF ELECTRONICS ROBOTICS ENGINEERING

PROGRAMME OUTCOMES:

PO1: Basic and Discipline specific knowledge: **Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.**

PO2: Problem analysis: **Identify and analyse well-defined engineering problems using codified standard methods.**

PO3: Design/ development of solutions: **Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.**

PO4: Engineering Tools, Experimentation and Testing: **Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.**

PO5: Engineering practices for society, sustainability and environment: **Apply appropriate technology in context of society, sustainability, environment and ethical practices.**

PO6: Project Management: **Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.**

PO7: Life-long learning: **Ability to analyse individual needs and engage in updating in the context of technological changes.**

CREATIVE DESK

Mr.C.VEERAMANI .M.E, HOD REVIEWER,

Mr.J.STUART KIRUBHAKARAPANDIAN .M.E, LECTURER CONVENOR,

Mr. SINGARAVELAN M .M.E, LECTURER EDITOR INCHARGE,

Mr.M.MOHAMED JINNA, M.E, LECTURER EDITOR MEMBER,

Mrs.V.DHIVYA.M.Tech, LECTURER

EDITOR MEMBER

SELVAN M.MANI R, III YEAR STUDENT MEMBER

SELVAN PAVAN KUMAR G, II YEAR

Index

Faculty Articles	01
Student Venture	11
Enhancements in Robotics Technology	17
Technical Quiz	18
Cross words	19
Visual archive	21

UNDERWATER WIRELESS COMMUNICATION SYSTEM USING IR SENSOR IN ELECTRONICS - ROBOTICS ENGINEERING

By Mr.VEERAMANI C, M.E., /HOD

ABSTRACT:

Wireless communication is a vital component of underwater operations, including environmental monitoring, surveillance, and exploration. However, traditional wireless communication methods such as acoustic or radio frequency suffer from limited range, low bandwidth, and interference. Infrared technology has emerged as a promising solution for underwater wireless communication due to its ability to transmit high-bandwidth data over long distances with minimal interference. In this review, we provide an overview of the current state of the art in underwater wireless communication systems that utilize infrared technology. We discuss the various components of these systems, including the transmitters, receivers, and signal processing techniques. Additionally, we explore the benefits and limitations of using infrared technology for underwater wireless communication and identify areas for future research.

INTRODUCTION:

Underwater wireless communication is essential for a range of applications, including environmental monitoring, underwater exploration, and surveillance. However, the harsh underwater environment presents several challenges to wireless communication, including attenuation, multipath propagation, and interference. Traditional wireless communication methods such as acoustic or radio frequency suffer from limited range and low bandwidth.

Therefore, there is a need for an effective and efficient method for underwater wireless communication. Infrared technology has emerged as a promising solution for underwater wireless communication due to its ability to transmit high-bandwidth data over long distances with minimal interference.

Infrared technology has been successfully used in various applications such as building automation, industrial control, and medical devices. In recent years, researchers have focused on developing infrared-based systems for underwater wireless communication.

IMPORTANT COMPONENTS:

An underwater wireless communication system using infrared technology consists of several components, including transmitters, receivers, and signal processing techniques. The transmitter used in this system is typically a high-intensity infrared light source that can transmit data through the water column.

Arduino Controller Board:

Arduino is a microcontroller based open source electronic photo typing board which can be programmed with an easy-to-used. Arduino IDE Arduino board styles use a range of microprocessors and controllers. The board's area unit equipped with sets of digital and analog input/output (I/O) pins which will be interfaced to numerous enlargement boards ('shields') or breadboards (For prototyping) and different circuits. The board features serial communications interfaces, as well as Universal Serial Bus (USB) on some models that also is used for loading programs from personal computers. The microcontrollers may be programmed victimization C and C++ programming languages.

ATmega328 microcontroller:

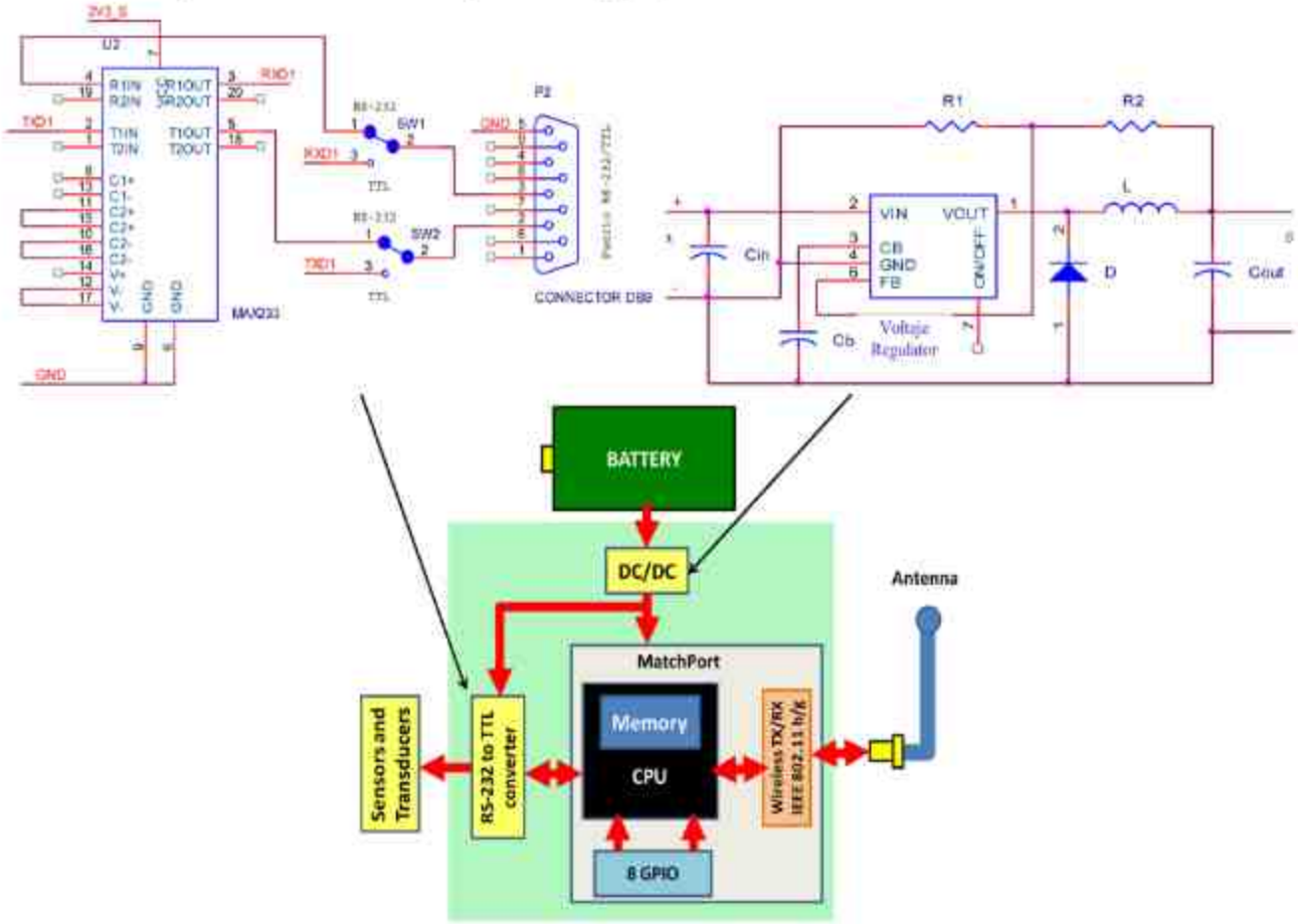
The ATmega328 may be a single-chip microcontroller created by Atmel within the mega AVR family. The Atmel 8-bit AVR RISC-based microcontroller combines thirty two computer memory unit ISP non-volatile storage with read while-write capabilities, one computer memory unit EEPROM, 2 KB SRAM, twenty three general purpose I/O lines, thirty two general purpose operating registers, 3 versatile timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte oriented 2-wire serial interface, SPI interface, 6-channel 10-bit A/D convertor, programmable watchdog timer with internal generator, and 5 code selectable power saving modes.

Liquid Crystal Display:

It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.

Heart Beat Sensor:

Pulse detector may be a well-designed plug-and play heart- rate detector for Arduino. It will be used by students, artists, athletes, makers, and game & mobile developers WHO wish to simply incorporate live heart rate knowledge into their comes. It conjointly includes Associate in Nursing ASCII text file watching app that graphs your pulse in real time. The normal resting vital sign for adults over the age of ten years, together with older adults, is between sixty and one hundred beats per minute (bpm).



CONCLUSION:

The use of an IR sensor in an underwater wireless communication system offers several advantages, including low power consumption, low cost, and ease of implementation. The IR sensor allows for data transmission through the water using light waves, which can travel a considerable distance with minimal attenuation. Furthermore, the IR sensor can be integrated with other underwater sensors and devices to create a comprehensive underwater communication network. However, it is important to note that the effectiveness of the IR sensor in an underwater wireless communication system depends on various factors, such as water clarity, depth, and ambient light conditions. Therefore, further research and development are needed to improve the reliability and performance of this technology for practical applications in underwater communication systems.

DESIGN AND FABRICATION OF ELECTRIC CYCLE FABRICATION IN ELECTRONICS - ROBOTICS ENGINEERING

By Mr. SINGARAVELAN M, M.E., /LECTURER

Abstract-

The main aim of this review paper is to present the idea of harnessing the various energy and use it in today's existence of human life .Now-a-days there are so many vehicles on road, which consumes more fuel and also hazards our environment. It is our responsibility to reduce the consumption of fuel and its hazardous emission products. Taking this into consideration it is our small step towards reducing the use of more fuel consuming vehicles and attract the eye of people towards its alternatives i.e. Electric bicycle. So we intend to design a cycle which would run on an alternative source and also reducing human efforts called as Battery Operated Cycle. In this paper we design an alternative mode of transport for betterment of social and environment.

INTRODUCTION:

The electric bicycle is an electrical-assisted device that is designed to deliver the electromagnetic momentums to a present bicycle therefore relieving the user of producing the energy essential to run the bicycle.

It contains a strong motor and enough battery power that just needs charging to help in hill climbing, generate greater motoring speeds and provide completely free electric transportation. Electric vehicles price more and perform poorer than their gasoline counterparts.

The aim is that mainly because gasoline cars have promoted from a century of intensive development; electric cars have been virtually overlooked for several years. Even today, gasoline cars profit from billions of dollars of research every year while electric vehicles receive a small fraction of that quantity of money. The primary principle for the Universities" support of the electric powered over the petrol powered has been towards improving air quality, though air quality alone is not a satisfactory justification to mandate electric bicycles.

The single biggest advantage of electric bicycle is that it is cost operative as it mainly only entails building cost as running cost would only require the charging of the battery. An Electric bicycle would, however offer other solid benefits that are overlooked by the marketplace.

These include the intense reduction in oil consumption that its widespread use would bring about. Much less oil would be needed because only a tiny proportion of electricity is generated from oil. The further major non-market benefit would be lower greenhouse gas emissions.

IMPORTANT COMPONENTS:

DC MOTOR:

A DC motor is one of a class of rotary electrical machines that converts direct current electrical power into mechanical power. The most mutual types rely on the forces created by magnetic fields. Nearly all types of DC motors have specific internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in portion of the motor. DC motors were the first type commonly used, since they could be powered from present direct-current lighting power distribution systems.

A DC motor's speed can be controlled over a extensive range, using either a variable supply voltage or by changing the strength of current in its field windings. Tiny DC motors are used in tools, toys, and appliances. The universal motor can operate on direct current but is a lightweight motor used for

convenient power tools and appliances. Bigger DC motors are used in propulsion of electric vehicles, elevator and hoists, or in drives for steel rolling mills. The arrival of power electronics has made replacement of DC motors with AC motors possible in many applications.

Working Principle:

A motor is an electrical machine which translates electrical energy into mechanical energy. The principle of working of a DC motor is that "whenever a current carrying conductor is placed in a magnetic field, it practices a mechanical force".

CONTROLLER:

A) Speed Control Basics:-

The speed controller of an electric bike is an electronic circuit that not only controls the speed of an electric motor but also serves as a dynamic brake. This controller unit uses power from the battery box and drives it to the motor. Different forms of controllers are used for brushed and brushless motors. For adaptive e-bikes, a conversion kit is used and the controller is the core component of that kit.

B) Function:-

The electric bike speed controller sends signals to the bike's motor in many voltages. These signals detect the direction of a rotor relative to the starter coil. The suitable function of a speed control depends on the employment of various mechanisms.

In a purpose-built electric bike, Hall Effect sensors help detects the location of the rotor. If your speed controller does not include such sensors and the speed controller on an adaptive bike may not the electromotive force of the un-driven coil is calculated to get the rotor orientation.

The mechanism of an electric speed controller differs depending on whether you own an adaptive or purpose build electric bike. An adaptive bike includes an electric drive system installed on a normal bicycle. A purpose built bike, more expensive than an adaptive bike, provides easier acceleration and affords extra features.

C) Battery:-

Two lead acid rechargeable batteries of 12v, 9 amp are used which are connected in parallel position. It basically stores the electrical energy generated and utilize it to run the motor. A battery has a positive terminal called cathode and negative terminal called anode. The terminal marked positive is at higher electric potential energy and the terminal marked negative is source of electrons when connected to external circuit will flow and deliver energy to external device Rechargeable batteries are recharged multiple times.

D) Motor Controller Circuitry:-

It used to control all the working of cycle.

E) Electric Motor:-

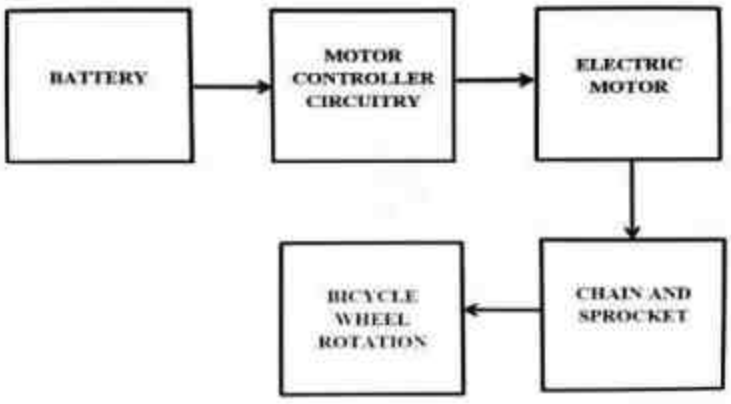
Use the specific motor having suitable power and torque according to design.

F) Chain and Sprocket:-

Take the suitable material & no. of teeth according to center distance.

G) Bicycle Wheel Rotation:-

Provide the torque and speed to the wheel throughout sprocket.



CONCLUSION:

This project is designed to improve the normal bicycle and make it extra efficient. The electric bicycle is a hybrid and so it can run electrically and can also be pedaled thereby still retaining the exercise people drive from riding bicycle.

A MODIFIED PI-CONTROLLER BASED HIGH CURRENT DENSITY DC – DC CONVERTER FOR EV CHARGING APPLICATIONS IN ELECTRONICS - ROBOTICS ENGINEERING

by Mr.J.STUART KIRUBAKARA PANDIAN, M.E., /LECTURER

Abstract:

Electric vehicles (EVs) are getting more popular in automobiles due to environmental factors. Since electric vehicles manage their power from the rechargeable battery, therefore, it's essential to have a reliable, efficient, and economical battery charger to provide stable required output for the specified EV's battery.

In this paper, a DC-DC converter with a modified PI controller has been presented which helps to achieve the required output voltage and high current density with negligible overshoot for the specified lithium-ion battery system to minimize the charging time.

Apart from minimizing the power loss of the active switches, the proposed system minimizes the junction temperature eventually improving the life cycle of the converter. The analysis of the proposed converter is performed both in ideal and non-ideal conditions. The power loss of the active switches and the junction temperature have also been analyzed.

An effective and economical dc and ac side inductors have been designed and analyzed the performance of total power loss and temperature rise. The results show that the proposed converter can maintain a power factor around 90% and a total harmonic distortion around 0.46%, which is ideal for the high-density load current. The reliability of the dc-dc converter is also evaluated. A hardware prototype has also been implemented to confirm its viability for EV battery charging applications.

INTRODUCTION

In electric vehicles (EVs) the rechargeable battery is one of the important and sophisticated systems which deliver power to run the EVs. So, it is important to have an efficient, reliable, and economical battery charger for EVs. An AC-DC converter is needed to full fill the requirement.

An AC-DC converter can be isolated or non-isolated. In the non-isolated system, the diode and active switch do face more stress which conveys more power loss will take place. Consequently, the temperature will be higher, and since isolation is not present it might be an issue in terms of safety. Whereas in an isolated system the diode and active switch might face less stress since the voltage can be lowered to maintain the requirement which states that the power loss will be lower, and the temperature will be lower in the junction of these devices besides the safety factor will be higher since its isolated. Consequently, improve the reliability of the overall system.

To perform the AC-DC operation the conventional diode rectifier might be used which leads to more power loss consequently the power factor as well as THD degrades. To maintain the PFC tropology might be used which is complicated and costly.

To get rid of it a low-frequency coupled inductor-based AC-DC converter has been used which is associated with a LCL filter and two diodes. Afterward, the voltage might need to be regulated according to the lithium-ion battery's condition. To fulfill this task, a closed-loop DC-DC converter can be used. The conventional closed-loop DC-DC converter dissipates high power loss in the active switches which might decay the life cycle of the overall system. The most power loss occurs in conventional closed-loop DC-DC converters due to conduction, switching, and leakage power losses. Besides, the overshoot does present at the output voltage and current which might be ailing the lithium-ion battery.

To conquer a modified proportional integral (MPI) controller be bought from our previous work and again modified which helps to reduce not only the overshoot at the output voltage and current but also to reduce the conduction power loss, switching power loss, and leakage power loss. Besides, the current prosecution has also been improved. This implies total power loss will be reduced without sacrificing the switching frequency that helps to maintain the size of passive components.

With the active switch, the thermal management heat sink has been addressed which helps to maintain the junction temperature by increasing the surface area associated with ambient.

This paper presents a reliable, efficient, and economical AC-DC converter for charging Electric Vehicles' lithium-ion battery. A detailed analysis of the converter as well as the power loss and junction temperature of the MOSFETs also be analyzed with three different conditions. At the end, the hardware prototype's consequence is also presented to validate the proposed prosecution.

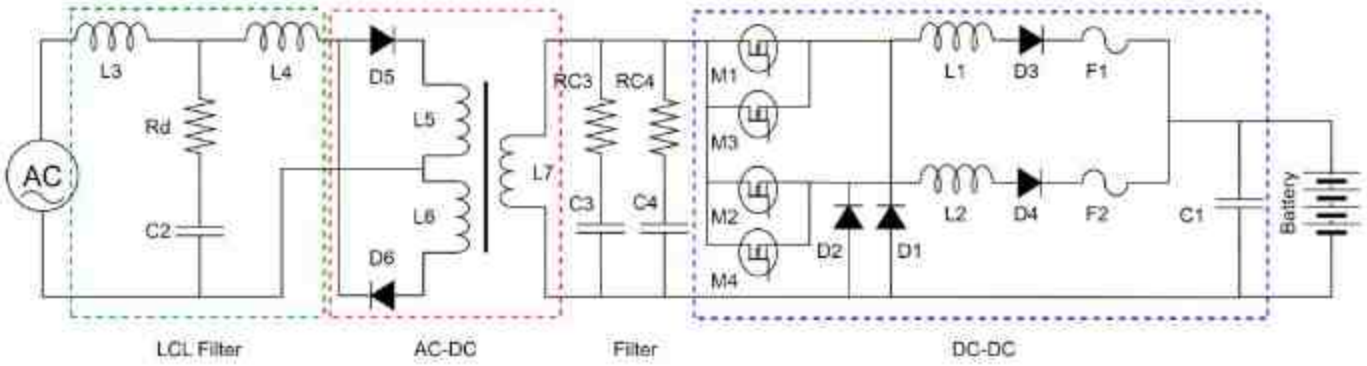


FIGURE 1. Proposed system.

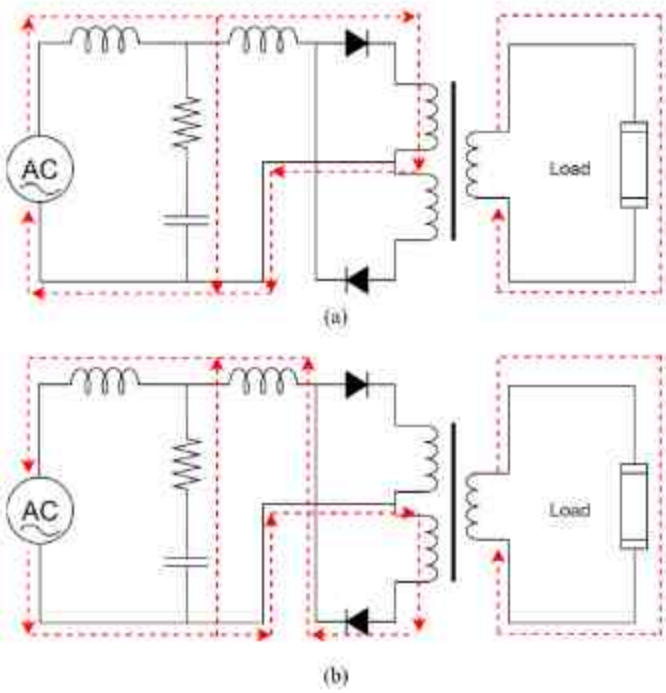


FIGURE 2. Working modes of the AC-DC converter with LCL filter (a) MODE ONE and (b) MODE TWO.

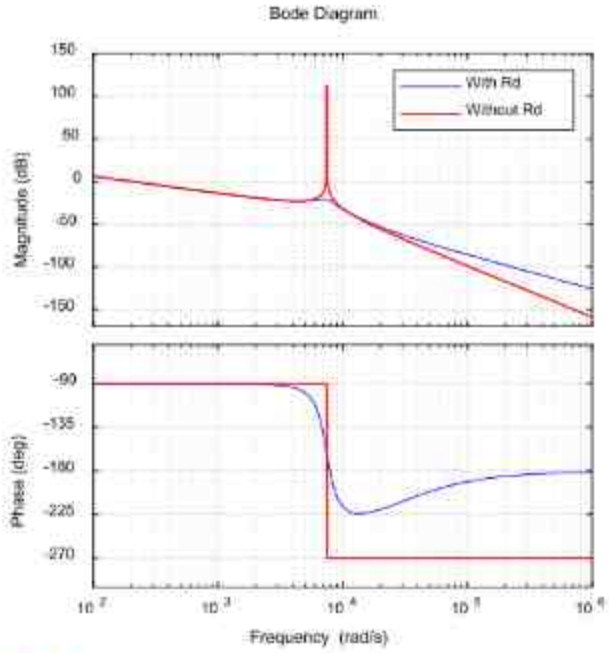


FIGURE 3. Bode plot of the designed LCL filter.

CONCLUSION

This paper proposes a modified PI-controller-based high-gain DC-DC converter for EV charging applications. The steady state analysis of the proposed converter both in ideal and non-ideal conditions shows the relation among input voltage, output voltage, and the prosecution. The power loss and thermal analysis of the MOSFETs manifest that the proposed prosecution has the ability to reduce the total power loss of the MOSFETs as well as temperature.

For effective and economical operation, the DC and AC side inductors have been designed properly. The results state that the designed inductors stay underneath the saturation region, and the temperature rise is at an acceptable range. With the proposed converter and prosecution, the system can charge the lithium ion battery with 152.1A while maintaining the overshoot and other factors. Besides, the power factor and the THD were achieved at 90% and 0.46% respectively.

The frequency response of the dc-dc converter confirms the system's stability in ideal and non-ideal conditions. The analysis of the MOSFETs power loss and temperature profile confirms that the proposed system will be more reliable and operational than the conventional system.

DESIGN AND FABRICATION OF SMART SOLAR GRASS CUTTING WITH LAWN COVERAGE IN ELECTRONICS - ROBOTICS ENGINEERING

By Mr.S.SHANMUGAM, M.E., /LECTURER

Introduction:

In this section, you'll provide a brief overview of the project. You'll emphasize the importance of maintaining well-trimmed lawns and introduce the concept of smart solar-powered grass cutting technology.

Objective

The main goal of your project should be clearly stated here. Additionally, highlight the key features of your smart grass cutting system. These features could include autonomous navigation, real-time monitoring, and energy efficiency.

Literature Review

Review existing grass cutting technologies. Discuss the benefits of solar-powered systems, emphasizing their sustainability and reduced environmental impact. Explore smart features found in modern lawn care equipment.

Methodology

Describe the design process you followed. Explain the components used in your system and provide details about the fabrication process. This section will give readers insight into how your smart grass cutting system was developed.

System Design

Offer an overview of your smart grass cutting system. Create a functional diagram illustrating the components and their interactions. Explain how software and hardware are integrated to achieve the desired functionality.

Smart Features

Detail the sensors you've employed for lawn coverage. Discuss the autonomous navigation system that allows your grass cutter to efficiently cover the entire lawn. Highlight real-time monitoring and control capabilities.

Solar Power System

Provide an overview of your solar panel arrangement. Explain the charging and power management system that harnesses solar energy. Discuss the efficiency and sustainability of using solar power for your grass cutting system.

Testing and Validation

Describe the testing procedures you conducted. Present test results and analyze the system's performance. Validate its efficiency and reliability based on the data collected during testing.

Future Improvements

Identify potential enhancements for your system. Offer suggestions for optimizing performance and functionality. Discuss scalability and prospects for commercialization.

Conclusion

Summarize key findings and achievements from your project. Recap the significance of your work in the context of smart solar-powered grass cutting technology. Share your thoughts on its future development.

DESIGN AND FABRICATION OF LIDAR BASED OBJECT DETECTION FOR MILITARY SPYING IN ELECTRONICS - ROBOTICS ENGINEERING

By Mr.M.MOHAMED JINNA, M.E., /LECTURER

LIDAR (Light Detection and Ranging) is a remote sensing method that uses light in the form of a pulsed laser to measure ranges. It has numerous applications in military and aerial contexts. Let's delve into the details of the **LIDAR-based military spying project**:

1. **Project Overview**:
   - The goal of this project is to create an advanced LIDAR-based system for military surveillance.
   - The system continuously scans an area and detects objects within a specified range.
   - When an intruder enters this range, the system produces a beep sound and displays the exact position and angle of the detected object on an LCD display.
2. **Components**:
   - **Atmega 328p**: Microcontroller used for processing.
   - **LiDAR**: The LIDAR sensor that emits pulsed laser light and measures distances.
   - **20×4 LCD**: Display for showing information.
   - **Resistors, Capacitors, Transistors**: Basic electronic components.
   - **Cables and Connectors**: Wiring components.
   - **Diodes**: Used for rectification.
   - **PCB and Breadboards**: Prototyping boards.
   - **LED**: Visual indicators.
   - **Transformer/Adapter**: Power supply.
   - **Push Buttons, Switch IC, IC Sockets**: User interface components.
3. **Functionality**:
   - The LIDAR system scans the area continuously.
   - If an object enters the specified range, the system:
     - Produces a beep sound.
     - Displays the exact position and angle of the object on the LCD.
   - This helps track the object's movement and path.
4. **Significance**:
   - Military applications: Enhances surveillance and security.
   - Prevents enemies from approaching critical targets.
   - Potentially saves lives by providing early detection.
5. **Project Report and Documentation**:
   - You can find a detailed project report, including the system design, implementation, and results, on the Electronics Project website.

Remember that LIDAR-based systems have broader applications beyond military spying, including autonomous vehicles, environmental monitoring, and 3D mapping. If you're interested in further research, there's a comprehensive survey of robust 3D object detection methods in LiDAR point clouds available on arXiv as well. Happy exploring! 🚀

DESIGN AND FABRICATION OF IOT SOCIAL DISTANCING AND MONITORING ROBOT FOR QUEUE IN ELECTRONICS - ROBOTICS ENGINEERING

BY Mrs. DHIVYA V, M.E., /LECTURER

Let's delve into the details of the **IOT Social Distancing & Monitoring Robot for Queues**:

1. **Project Overview**:
   - During the current pandemic, **social distancing** is crucial to limit the spread of COVID-19 by maintaining a perceived distance between people who may transmit the disease.
   - However, it's not feasible to station someone in each queue row 24/7 to monitor social distancing violations in places like banks, shopping centers, schools, and theaters.
   - To address this, a **social distancing robot** has been developed. Its purpose is to mechanically observe pairs of people in crowded environments and ensure compliance with social distancing rules.
   - The robot continuously monitors queues and tracks behaviors that violate social distance norms.
2. **Robot Features**:
   - **Four-Wheel Frame System**: The robot uses a four-wheel frame system for mobility.
   - **Tail Tracking Principle**: It employs tail tracking to continuously monitor queues.
   - **Infrared Sensor**: The robot moves its stern left and right to detect social distancing violations.
   - **Ultrasonic Obstacle Detection Sensors**: These sensors help detect obstacles in the robot's path.
   - **Distance Measurement**: Another ultrasonic sensor determines the distance between two people.
   - **Immediate Warning**: If the distance between people is less than two meters, the robot beeps and alerts of potential violations.
   - **IoT Connectivity**: The robot sends violation notices and camera images via WiFi to notify relevant authorities or key workplaces[1].
3. **Significance**:
   - The robot contributes to maintaining social distancing in crowded places, reducing the risk of virus transmission.
   - It provides an automated solution for monitoring queues and ensuring compliance with safety guidelines.
4. **Project Reports**:
   - You can find detailed project reports on this topic:
     - International Journal of Engineering Trends and Applications (IJETA)
     - SSRN (IOT Based Social Distancing and Monitoring Robot for Queue)

Remember, innovative solutions like this robot play a vital role in safeguarding public health during challenging times. □ ✸

STUDENT VENTURE

509, Er.PERUMAL MANIMEKALAI POLYTECHNIC COLLEGE, HOSUR 635 117.
DEPARTMENT OF ELECTRONICS (ROBOTICS) ENGINEERING.
PROJECT WORK - 2022 - 2023

Sl. No.	Reg.No.	Name of the Student	Batch. No.	Project Title	Project Guide
1	**21404185**	**PRASANTH KUMAR C**	I	GREEN ENERGY BASED POISON AND GASLESS SUPER FAST SEMICONDUCTOR COOLER	Mr.VEERAMANI C
2	21404177	DHANUSH RAAMKESH K			
3	21404181	JEEVA B			
4	21404173	AKASH G			
5	21404193	VENKATESH R			
6	**21492473**	**HILTON PAUL A**	II	AUTOMATIC STADIUM POWER MANAGEMENT WITH PARTICIPANT COUNTER	Mr.M. Mohamed Jinna
7	21404191	THARUN BS			
8	21404182	MANJUNATH S			
9	21404186	PRATHEEP M			
10	21404178	GANESH S			
11	**21492471**	**BALAMURUGAN R**	III	LINE FOLLOWER ROBOT	Mr.K.STUART KIRUBAKARA PANDIAN
12	21492469	ARAVIND R			
13	21404176	DHANRAJ M			
14	21404172	ABRAR M			
15	21404184	PRAJWAL C			
16	**21404174**	**ARAVIND A**	IV	DYNAMIC LOGIC CONSTRUCTION OF VEHICLE HEALTH MONITORING AND CONTROLLING SYSTEM USING CAN PROTOCOL	Mr.M.SINGARAVELAN
17	21404190	SURIYAPRAKASH N			
18	21492472	HARISH A			
19	21404187	RAKESH S			
20	21492470	ARUL M			
21	**21404175**	**ARUN J**	V	A NEW MODELING OF CONTACTLESS HUMAN BIO WAVES MONITORING SYSTEM THROUGH ANDROID ENVIRONMENT	Mr.S.SHANMUGAM
22	21404189	SANJAY K			
23	21404179	IRFAN M			
24	21404183	MUTHUMANICKAM K			
25	21404192	THIMMARAJ M			

GREEN ENERGY BASED POISON AND GASLESS SUPER FAST SEMICONDUCTOR COOLER

Aim:

To design and implement the poison less, low cost and green energy based super cooler system using semiconductor structure.

Methodology:

Existing methodology:

- Compressed Gas based cooling system. It has poison content

Proposed Methodology:

The increase in demand for refrigeration (cooler) globally in the field of air-conditioning, food preservation, medical services, vaccine storages, and for electronic components temperature control led to the production of more electricity and consequently an increase in the CO2 concentration in the atmosphere which in turn leads to global warming and many climatic changes.

Thermoelectric refrigeration is a new alternative because it can reduce the use of electricity to produce cooling effect and also meet today's energy challenges.

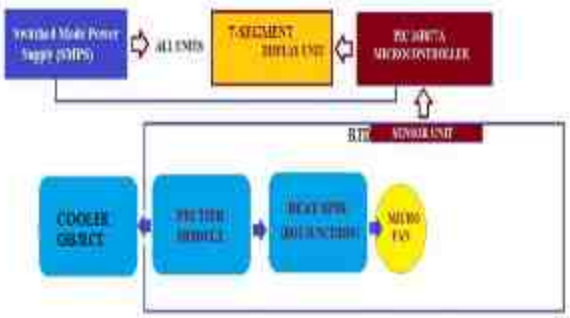
Therefore, the need for thermoelectric refrigeration in developing countries is very high where long life and low maintenance are needed.

The objectives of this study is to develop a working thermoelectric cooler to cool a volume of 25 L that utilizes the PELTIER effect to cool and maintain a selected temperature range of 5^0C to 25^0C.

The design requirements are to cool this volume to temperature within a short time and provide retention of at least next half an hour.

The design and fabrication of thermoelectric refrigerator for required applications are presented. This system also can be used as a heater.

Block diagram:



AUTOMATIC STADIUM POWER MANAGEMENT WITH PARTICIPANT COUNTER

Aim:

To design and implement the stadium power management and participant calculator schemes by using artificial intelligence.

Methodology:

Existing methodology:

- Manual control for power management as well as counting process

Proposed Methodology:

With the advancement of technology intelligent devices are fast approaching the realm of necessity from the status of luxury.

With limited energy resources, it is the need of time to revolutionize the traditional methods of counting visitors or participants inside auditorium, recreational places and meeting rooms to control the electrical appliances.

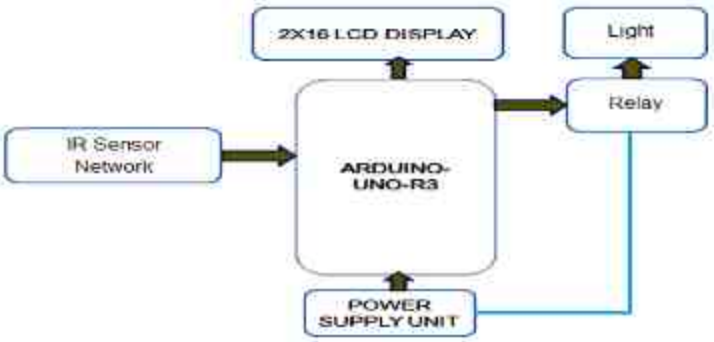
Moreover, the improved living standards demand developing circuits that would ease the complexity of life. Many systems have been developed to fill this technological gap but most of them are not applicable in real time scenarios due to their limitations.

This system describes the development and implementation of real time bidirectional visitor counter along with automatic power controller. The proposed system keeps track of visitors visiting a room as well as takes over the control of the room lights.

As a visitor enters the room, the count is incremented by one and the lights are switched on. While the count is decremented if a person leaves the room. Electrical devices of the room are switched off only if there is no person inside.

Though a number of systems have been developed in this field but most of them are not practically applicable due to outdated technology.

Block diagram:



LINE FOLLOWER ROBOT

Aim:

To design and implement the path or line following robotic structure without programming device.

SYNOPSIS

Methodology:

Existing methodology:

Most of the line or path finding robotic design based on programming controller.

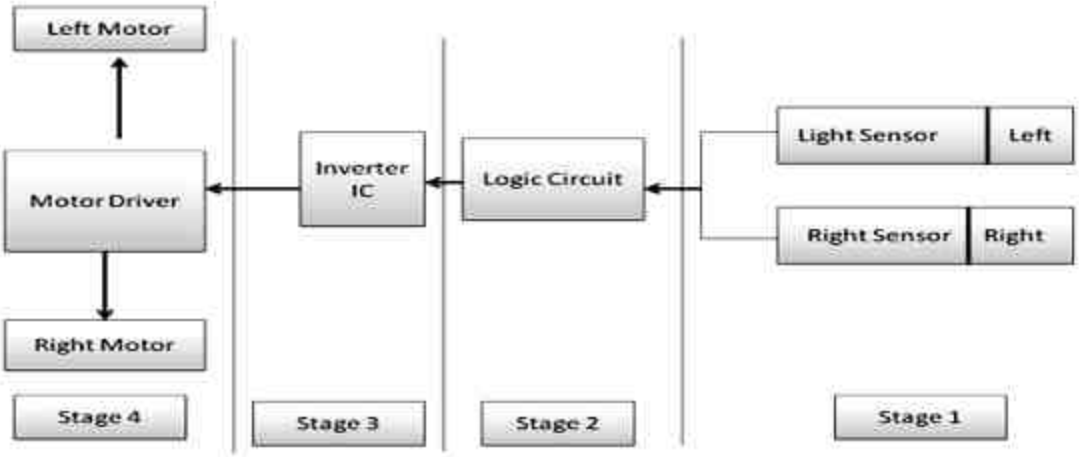
Proposed Methodology:

Line follower is an autonomous robot which follows either black line in white area or white line in black area. Robot must be able to detect particular line and keep following it. For special situations such as cross over's where robot can have more than one path which can be followed, predefined path must be followed by the robot. Line following is a task in which robot has to follow the line. It must be capable of taking various degrees of turns to follow the curved lines also.

The Line following Robot moves to follow a line drawn on the floor. This Robot follows the black line which is drawn over the white surface .The line sensors are used to sense the line. When the signal falls on the white surface, it gets reflected and if it falls on the black surface, it is not reflected this principle is used to scan the Lines for the Robot.

The Robot should be capable of taking various degrees of turns and must be insensitive to environmental factors such as lighting and noise.

Block diagram



DYNAMIC LOGIC CONSTRUCTION OF VEHICLE HEALTH MONITORING AND CONTROLLING SYSTEM USING CAN PROTOCOL

Aim:

To design and implement the monitoring of vehicle health condition to avoid the travelling risk.

Methodology:

Existing methodology:

General parameters such as Engine temperature and oil, seat belt and door lock.

Proposed methodology:

In modern days the technical growth of each field reaching peak to peak especially automobile technology.

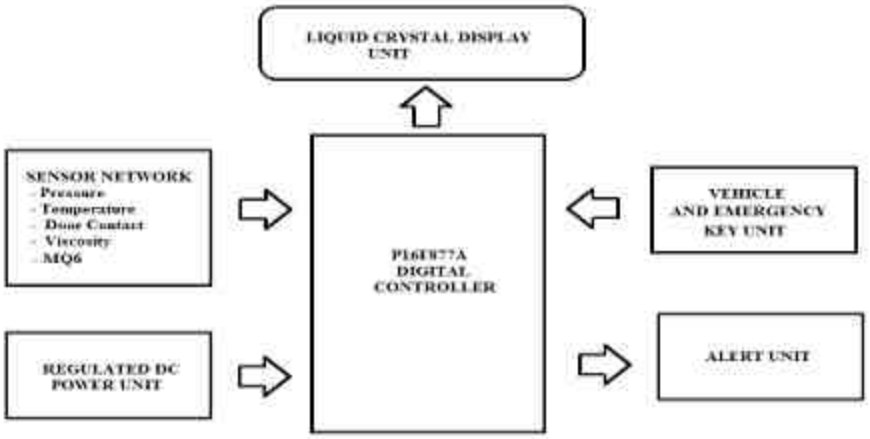
Networked Electronic Control Units (NECUs) are increasingly being deployed in automobiles to realize various functions and Controller Area Network (CAN) is deployed for the communications among ECUs. Our primary objective is to build both hardware and software that interface and communicate directly with CAN network and extract CAN messages for reliable vehicle health communications. Controller–area network (CAN or CAN-bus) is a vehicle bus standard designed to allow microcontrollers and devices to communicate with each other within a vehicle without a host computer.

CAN is a text message-based protocol, designed specifically for automotive applications but now also used in other areas such as industrial automation and medical equipment. The hardware is a circuit board that is capable of capturing CAN signals released from an automobile.

The need was identified to perform a single step effort in order to avoid every project willing to use CAN to solve individually the existing gap between terrestrial and space applications. The software will be both the firm-wares programmed for the microcontroller found on the circuit board, as well as the Graphical User Interface on the LCD screen that enables users to monitor the functionalities of automobile via a few simple presses of the micro buttons.

With the help of these developed components, CAN messages can be used for reliable vehicle health communications. The proposed system is designed and focused towards monitoring and alerting to the user about the vehicle health parameters such as conditions of the break, air pressure on the wheel, door and engine oil, temperature conditions etc., while the user switched on the vehicle.

Block Diagram



A NEW MODELING OF CONTACTLESS HUMAN BIO WAVES MONITORING SYSTEM THROUGH ANDROID ENVIRONMENT

Aim:

To design a smart system for measuring multi bio-waves signals through android application.

Methodology:

Existing Methodology:

The manual and single window measurements have been made.

Proposed Methodology:

The novel device presented here for monitoring respiration and pulse meets all the aforementioned requirements of an ideal on-body sensor. A mobile device is presented for monitoring both respiration and pulse.

The device is developed as a bendable/flexible inlay that can be placed in a shirt pocket or the inside pocket of a jacket.

It combines two sensors, both of which work in a noncontact way allowing unobtrusive monitoring.

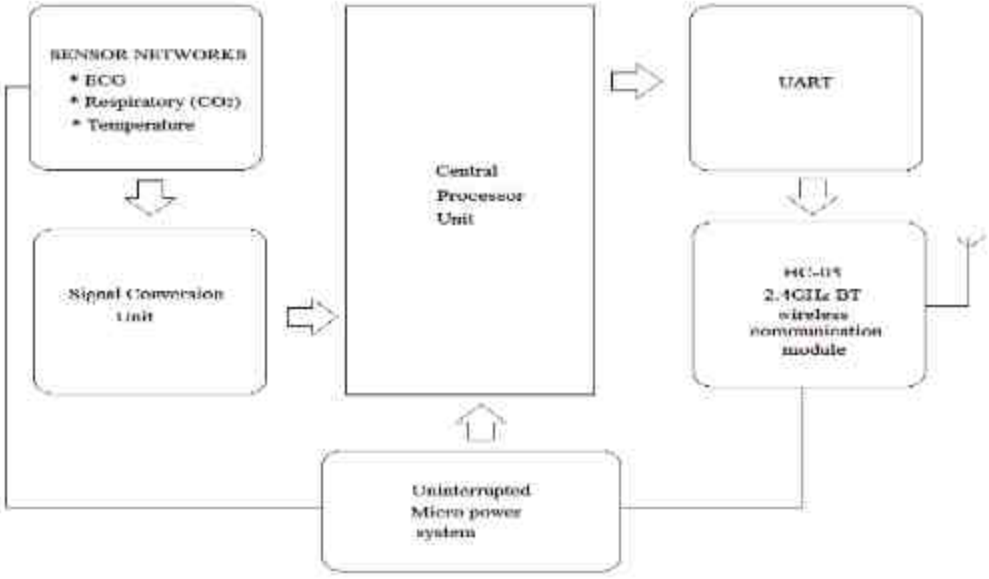
The device includes a microcontroller for data processing and a Bluetooth module for data transmission. The MQ-6 can be used to sense the CO2 level of the breathing air and converted into electrical signal.

To achieve optimum monitoring performance, the device combines three sensor principles, which work in a safe noncontact way through several layers of cotton or other textiles.

One sensor, based on CO2 (MQ-6), is intended for respiratory monitoring, LM 35 transistor is used to sensing the body temperature and the other is a reflective IR (Infra Red) sensor intended for pulse detection.

Because each sensor signal has some dependence on both physiological parameters, fusing the sensor signals allows enhanced signal coverage

BLOCK DIAGRAM:



ENHANCEMENTS IN ROBOTICS TECHNOLOGY

Let's delve into the exciting developments in the field of robotics during 2022-2023. Here are some key insights from the **World Robotics Report**:

1. **Record Robot Installations**:
   - In 2021, the robotics industry achieved a significant milestone with a record **517,385 new robotic installations** worldwide.
   - Factors such as labor costs, skills shortages, and technological advancements have contributed to this surge in robot usage.
   - Countries worldwide are investing heavily in automation to remain competitive in the global economy.
2. **Robot Density**:
   - Robot density, which measures the number of robots per 10,000 employees, provides insights into robotic adoption.
   - The average robot density in the manufacturing industry was **141 robots per 10,000 employees** (equivalent to 1 robot for every 71 employees).
   - The top five countries with the highest robot density in 2022 were:
     - **South Korea**
     - **Singapore**
     - **Germany**
     - **Japan**
     - **Sweden.**
3. **Industrial Robots vs. Service Robots**:
   - Industrial robots continue to dominate, with almost **4 million operating globally**.
   - The electronics industry remains a major customer for industrial robots.
   - Collaborative robots (cobots) are steadily growing their market share, accounting for 10% of installations.
4. **Regional Trends**:
   - **China**: China leads the way, installing every other robot globally. Its electronics industry is a significant driver.
   - **Japan**: Japan has seen strong recovery, driven by demand in electronics and automotive sectors.
   - **United States**: The US recorded its second-highest installation count ever, with the automotive industry playing a key role.
   - **Korea**: Korean robot demand remained steady, particularly in the electronics industry.
5. **Forecast for 2023**:
   - Approaching the **600,000-unit mark** in robot installations.
   - Supply chain constraints are easing, but inflation remains high.
   - Global economic growth slowdown may impact robot installations.
   - Technological trends include cloud computing and 5G mobile networks, driving new business models.

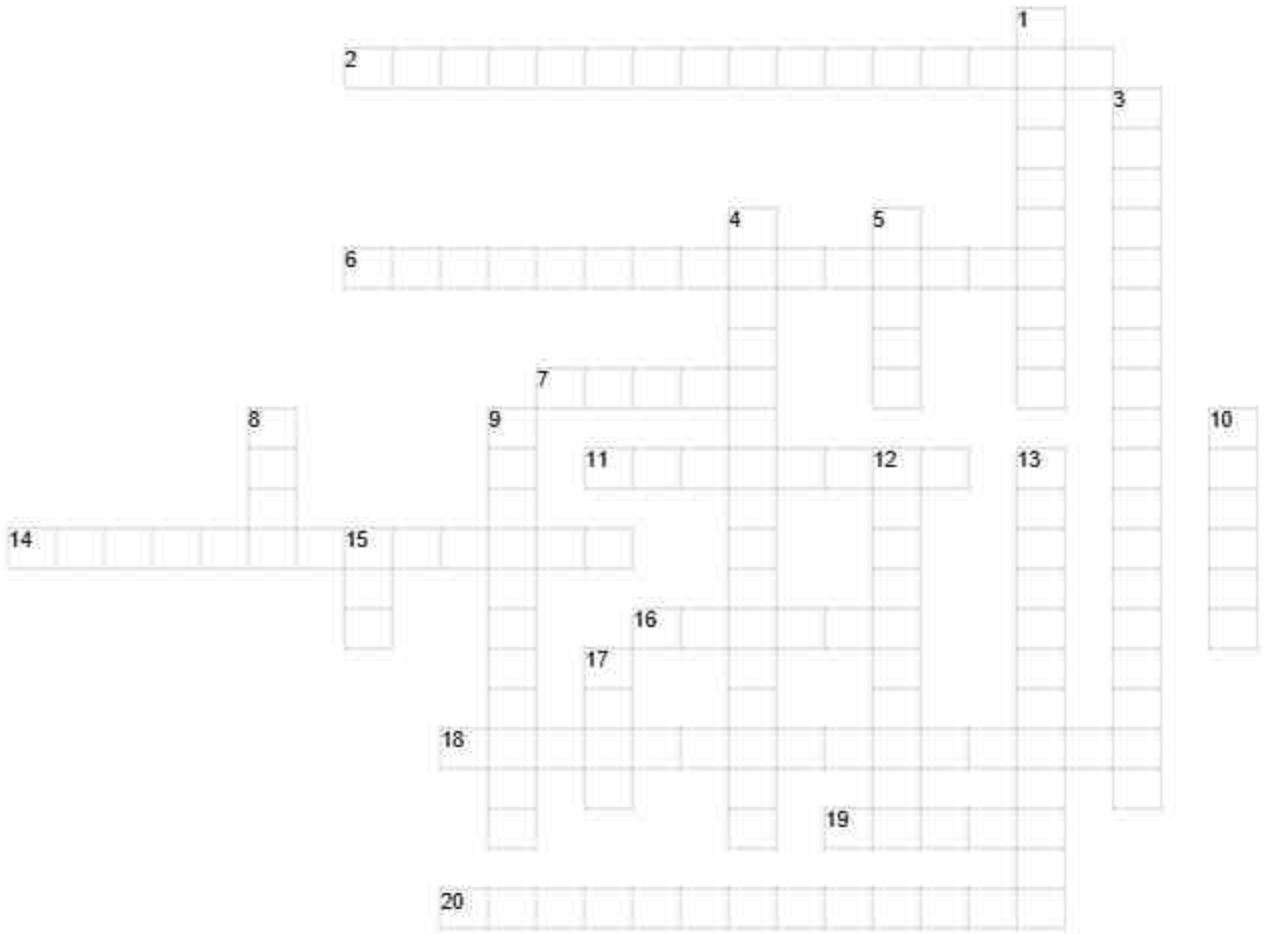
TECHANICAL QUIZ

1. **What is the term for the number of independent movements a robot arm can make?**
   - A) Degrees of Freedom
   - B) Axis of Rotation
   - C) Range of Motion
   - D) Kinematic Pair
2. **Which type of robot is known for its high speed and precision in pick-and-place operations?**
   - A) SCARA
   - B) Delta
   - C) Cartesian
   - D) Cylindrical
3. **What is the main advantage of using collaborative robots (cobots) in an industrial setting?**
   - A) They can operate at higher speeds than traditional robots.
   - B) They are designed to work safely alongside human workers.
   - C) They are less expensive than traditional industrial robots.
   - D) They do not require any programming.
4. **Which sensor type is commonly used in robotics for object detection and ranging?**
   - A) Gyroscope
   - B) Accelerometer
   - C) LiDAR
   - D) Thermocouple
5. **In the context of robotics, what does 'SLAM' stand for?**
   - A) Simultaneous Localization and Mapping
   - B) Synchronized Light and Motion
   - C) Systematic Loading and Movement
   - D) Sequential Linkage of Automated Machinery
6. **Which of the following is NOT a common application of industrial robots?**
   - A) Assembly
   - B) Painting
   - C) Welding
   - D) Data Entry
7. **What is the name given to the robotic 'arm' used for manipulating objects?**
   - A) End-effector
   - B) Manipulator
   - C) Actuator
   - D) Gripper
8. **Which programming language is most commonly used for developing robot control algorithms?**
   - A) Python
   - B) C++
   - C) Java
   - D) LISP

CROSS WORDS

Name: _____ Date: _____

Robotics



CROSS WORDS CON...

Across

- 2. The procedures use mathematical algorithms along with joint sensors to determine its location of a robot
- 6. re-programmable multifunctional manipulator designed to move material, parts, tools, or specialized devices, through variable programmed motions for the performance of a variety of tasks
- 7. This is commonly used as a non-contact sensor for robots. Robotic applications include: distance finding, identifying accurate locations, surface mapping, bar code scanning, cutting, welding etc.
- 11. The study of motion, the forces that cause the motion, and the forces due to motion.
- 14. removes drive power from the robot actuators, and causes all moving parts to stop.
- 16. It help the robot to determine the environment of the robot like light heat.
- 18. predicting the behavior and the operation of a robotic base the look of it
- 19. It can determine a position and orientation of an object in space, as well as the robot's position within its model.
- 20. able to add resources to the system, such as memory, larger hard drive.

Down

- 1. The robot predicting the behavior and the operation of a robotic, kinematics emulation, path-planning emulation, and simulation of sensors. See Sensor, Forward Kinematics, and Robot.
- 3. devices or computers separate from the robot for later input of programming information to the robot.
- 4. industrial robotic arm transfers materials from one place to another.
- 5. It moves and use mostly on this I can work will out it
- 8. It can work without you can build fine and it not being supporter by something
- 9. Follows commands you tell the robot
- 10. I help the robot move it arms or move
- 12. An information processing device whose inputs are both the desired and measured position, velocity or other pertinent variables
- 13. object to the workplace by gravity. Usually, a chute or container is so placed that, when work on the part is finished, it will fall or drop into a chute or onto a conveyor with little or no transport by the robot
- 15. Computer aided design can be say in a short way is
- 17. This items we use to build buildings fix robot house.

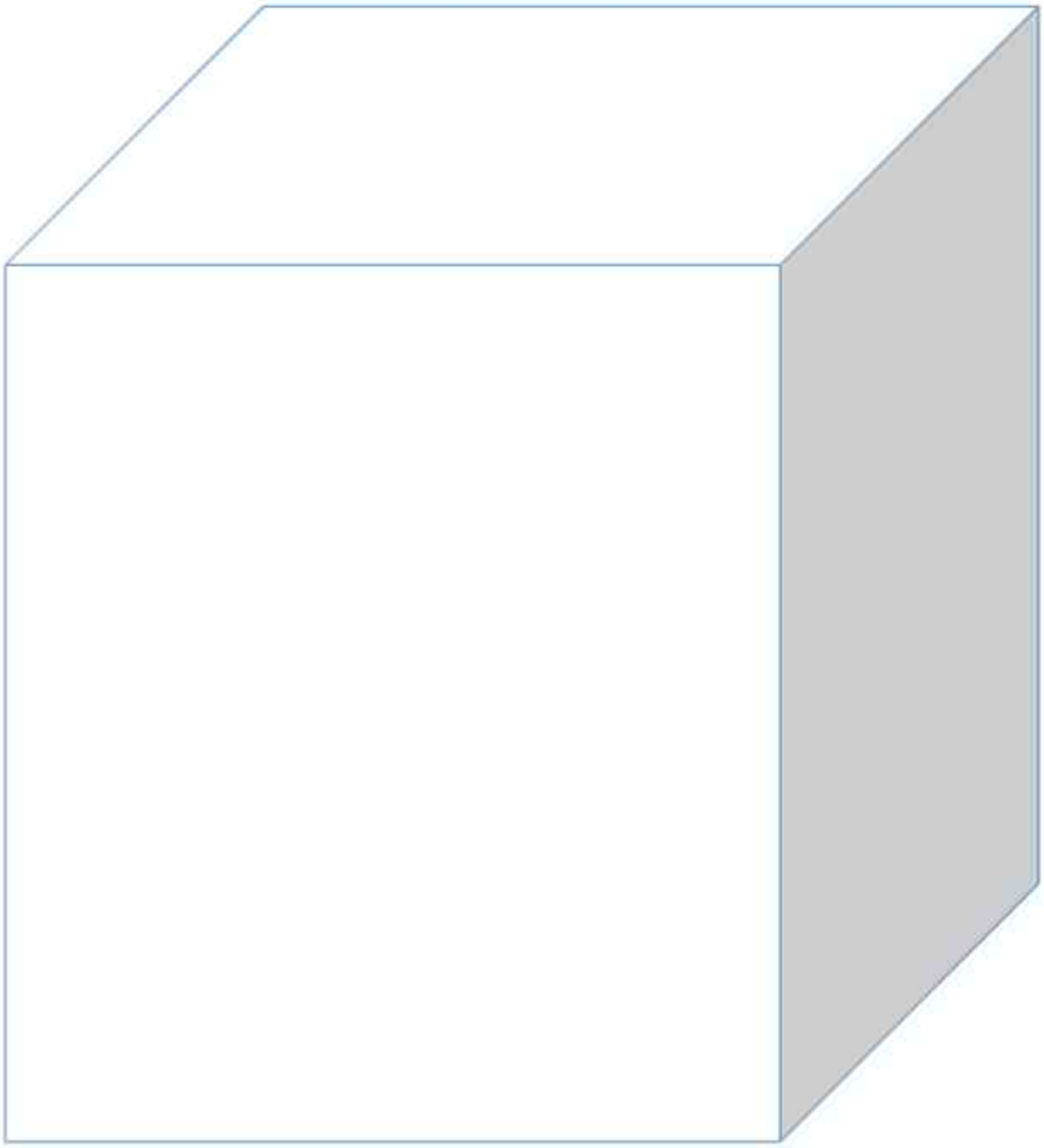
VISUAL ARCHIVE

VISUAL ARCHIVE CON ...

ROBOTICS

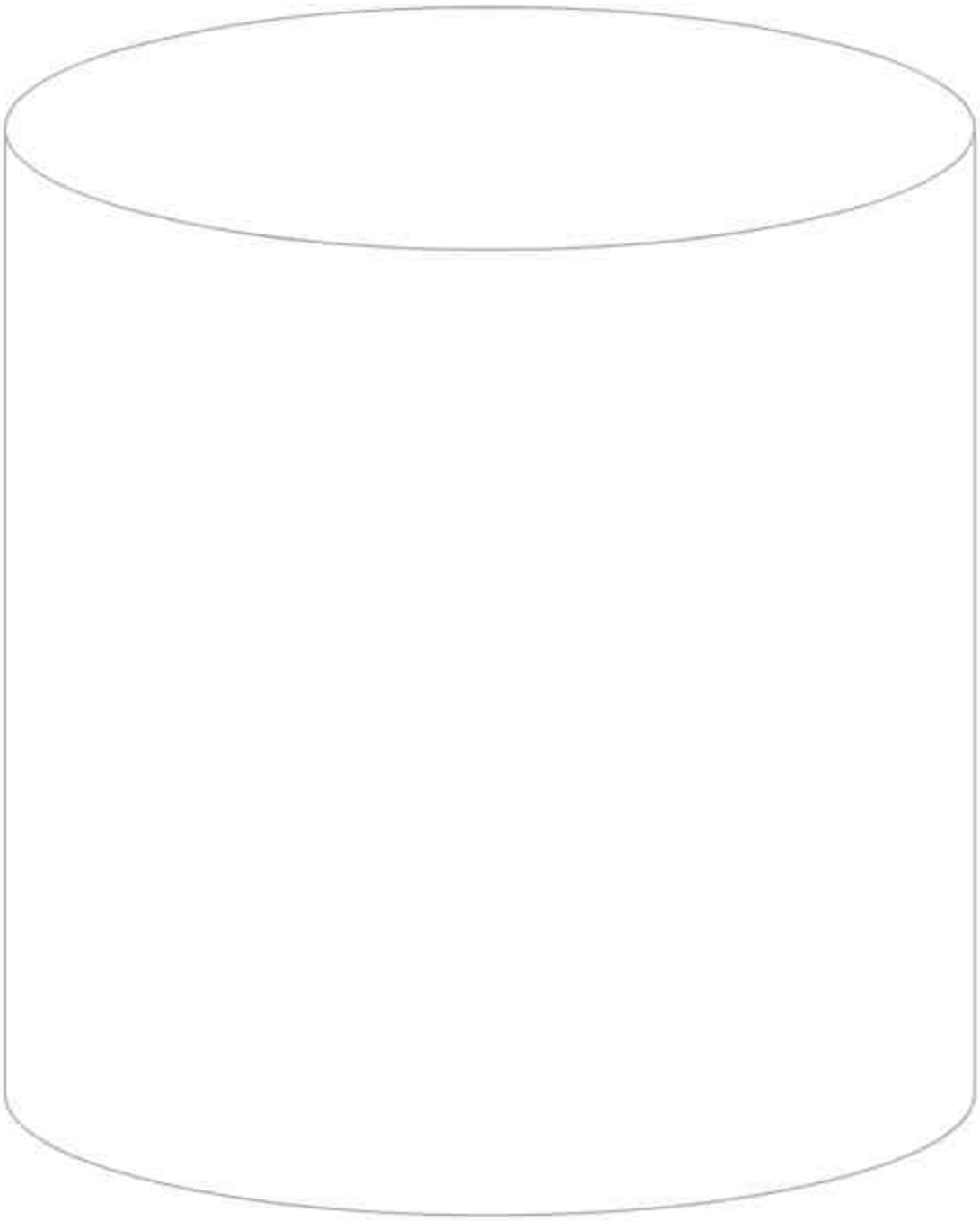
VISUAL ARCHIVE CON ...

VISUAL ARCHIVE CON ...



VISUAL ARCHIVE CON ...

VISUAL ARCHIVE CON ...



VISUAL ARCHIVE CON ...

VISUAL ARCHIVE CON ...