INDIAN JOURNAL OF SCIENCE AND TECHNOLOGY

Check for updates

* Corresponding author.

Intermediate Learning-Based Attention Regulated Densenet for Diagnosis of Covid-19

Roshan Shetty[1]*, S N Prasad[2], D V Manjunatha[3], V Veeraprathap[4], Vasudev Shahapur[5], M S Shwetha[6]

1 Reaserch Scholar, School of ECE, REVA University. Bengaluru & Dept. of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
2 Department of Electrical and Electronics Engineering, Manipal Institute of Technology Bengaluru, Manipal Academy of Higher Education Manipal, 576104, Karnataka, India
3 Sr.Professor, Department of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
4 Department of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
5 Department of CSE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
6 Department of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India

Abstract

Objectives: The AI-based Computer-Aided-Diagnosis of Chest X-Rays related to COVID-19 is very essential. Here we present an Attention regulated Pre-trained DenseNet-121with intermediate transfer learning as a Chest X-Ray image classifier to classify images according to three labels: COVID-19, pneumonia, and normal. **Methods:** We are proposing a new Attention regulated ImageNet pre-trained DenseNet-121 neural network architecture, which is retrained on NIH ChestX-ray14 data as an intermediate database before the actual COVID-19 database. We also fine-tuned the last layer of this neural network with a suggested novelty called the output neuron-keeping technique. Before feeding the Covid-19 data we removed all other neurons corresponding to Chest X-ray14 pathology classes except the "No finding" and "Pneumonia" classes. A new third neuron with random weights and bias is created in the final layer to detect Covid-19 pathology. A DenseNet-121 is supported by a GRAD-CAM-based attention mechanism in achieving detection accuracy and localization of pathologies. The used Covid-19 dataset is a combination of 370 Pneumonia, 1255 Normal, and 439 COVID-19 Chest X-Ray images. We randomly took 50 pictures from each class for testing purposes, the remaining images are augmented more to improve DenseNet performance on a small COVID-19 dataset. **Findings:** Our state-of-art model achieved 98.6% test accuracy since it misclassified one out of 50 Covid-19 images, and one out of 50 Pneumonia images, but all 50 normal Chest X-Ray images are classified with 100% accuracy. We compared our model with the other three state-of-the-art models, particularly under three-class classification problems (Pneumonia,

Siddesh

H.O.D.
Dept. Of Electronics & Communication
Alva' Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

A Review: Dynamic Wireless Charging of Electrified Vehicles

Shwetha M.S[1], Spoorthi Hirur[2], Shekhar B[3], Pradeep B[4], Sushma J[5]

[1]Assistant Professor, ECE, AIET, Mangalore, India

[2345]UG Scholar, Dept Of ECE, AIET, Mangalore, India

Abstract -- Future innovation is the electric car. The necessity for its popularisation is aided by the reduction of pollution and the utilisation of fossil fuels. The technology used in electric vehicles includes energy storage. The size of the battery, frequent charging, unfavourable meteorological conditions, etc., pose obstacles to the technology's widespread adoption. By offering an alternative method of power transfer to electric vehicles, the initiative seeks to assist the emerging sector of electric vehicles. The wireless magnetic resonance coupling theory underlies the operation of the proposed technology. The system will include specifically constructed highways with underground energised winding. The secondary windings will be located on the vehicle and will effectively link the greatest flux for a smooth and reliable power transmission.

Keywords: - Dynamic wireless Charging, Inductive Power Transfer, Dynamic wireless charging, Electric vehicle.

I. INTRODUCTION

A segmented charging station or a lengthy track that runs the length of the road can both be used with Dynamic Wireless Charging (DWC). A number of wireless charging pad transmitters are placed across the street in segmented charging-based DWC. The range of the Electric Vehicle could be extended with this configuration, but the battery's capacity could be drastically reduced. The cost of installation is decreased because just a portion of the lane needs to be electrified. The primary pads for segmented DWC are distributed throughout the road, while the secondary pads are attached to the Electric Vehicle. It provides the best coupling rate for the primary pad. This will improve system efficiency overall and lower standby losses and EMI emissions. Yet there are certain drawbacks to this technology. For instance, it could be costly and time-consuming.

II. LITERATURE SURVEY

Maglaras et al [1] introduces the concept of dynamic wireless charging, which allows power exchange while an electric vehicle is in motion. Currently, parking lots or bus stops are where one may find the fixed charging stations for this technology. Yet, a revolutionary concept known as Mobile Energy Disseminators (MED) has been proposed, allowing for the charging of cars while they are moving or without the usage of trucks or buses. The proposed approach offers a straightforward, affordable, secure procedure with enhanced energy transfer efficiency and a shorter delay in vehicle movement during charging, which addresses the drawbacks of existing methods. Moreover, this procedure reduces environmental contamination. Overall, this abstract highlights the MED approach for dynamic wireless due to its potential benefits.

Patil et al [2] in order to enable EVs consume less battery storage, study proposes a novel method for Dynamic Wireless Power Transfer (DWPT) EV detection. The suggested approach comprises identifying the EV before it arrives in order to begin energizing Just-in-time power transfer is made possible by the transmitter that is buried beneath the road. According to the paper, communication can be utilized as a reliable EV detection method at low speeds, but at high speeds, communication lag time becomes an issue. In order to solve this problem, the research offers a low-cost, low-power EV detection system based on a new orthogonal coil arrangement that can recognize EVs travelling quickly. Using simulation in Piecewise Linear Electrical Circuit Simulation (PLECS) and laboratory-scale testing, the study examines the suggested system's functionality.

Buja et al [3] for Dynamic Wireless Charging (DWC) for electric vehicles, a lumped track constructed of Double-D coils is used in EVs. Using an analysis employing the finite element approach, this work examines the coupling properties of Double-D coils of various dimensions. Analytical calculations are used to determine the length of the track coil required to deliver the propulsion energy required per unit of travelled space to a moving EV. Using the Double-D coil coupling

Siddesh

H. O. D.
Dept. Of Electronics & Communication
Alva' Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

Wi-Fi Module based Vegetable Plucking Robot

Shwetha M.S[1], Amrut Belavi[2], Anand[3], Andrew Arthur Gonsalves[4], Anil Patel[5]

[1]Assistant Professor, Dept. Of ECE, AIET, Mangalore, India

[2345]UG Scholar, Dept. Of ECE, AIET, Mangalore, India

---***---

Abstract - To overcome labor shortages and meet the increasing demand for high-quality yield, the agriculture field is moving towards technological solutions. The Wi-Fi module controlled vegetable plucking robot is a modern technology that can effectively automate the vegetable harvesting process. The proposed robot contains a Wi-Fi module which enables remote control from a computer or smartphone. It makes use of sensors and advanced algorithms to identify the ideal time for harvesting and to pluck vegetables gently to avoid hurting the plants. This technology has the possibilities to improve crop quality, enhance yield, and reduce labor expenditure for farmers. This Wi-Fi module controlled vegetable plucking robot set out as an outstanding example of how technology can address the current challenges in modern agriculture.

**Key Words**: *Wi-Fi module, sensors*

1. INTRODUCTION

The Wi-Fi module controlled vegetable plucking robot is a cutting-edge invention that is revolutionizing agriculture. Farmers are implementing new technologies to increase their production as a result of a lack of labor and an increase in the demand for food of high quality. By automating the vegetable harvesting procedure, this robotic gadget not only improves crop quality but also saves time and labor. The robot has a Wi-Fi module that enables farmers to remotely control it using their smartphones or computers from any location in the world. By giving farmers more flexibility and control over their farming operations, this technology enables them to manage their crops more effectively. The sophisticated Wi-Fi module-controlled vegetable plucking robot employs cutting-edge sensors and algorithms to identify the best moment for harvest and gently pluck the vegetables from the plants to prevent plant damage. By ensuring that the crops are harvested at the proper time, this method increases crop quality and yields. The robot can also distinguish between ripe and unripe vegetables, leaving the latter on the plant for later harvest and reducing crop waste.

The Wi-Fi module controlled vegetable harvesting robot has the ability to completely change the way agriculture is carried out. Farmers can greatly save labor expenditures by using it instead of manual harvesting. Additionally, the robot can operate around the clock, guaranteeing that crops are gathered on schedule even after-hours. With the use of this technology, farmers may operate more productively, save time, and manage their operations more effectively. An excellent illustration of how technology may be used to address the issues facing modern agriculture is the Wi-Fi module controlled vegetable plucking robot.

2. Literature survey

G. Kondo et al [1] proposed an end-effector to pick tomatoes without causing any damage, a manipulator with seven degrees of freedom, and a traveling device that makes up a tomato harvesting robot. The vision sensor must enable the robot to recognize the color and location of items. Additionally, it needs to recognize where barriers like leaves and stems are located. The tomato fruit cluster often contains numerous fruits that are next to another fruit. Sometimes the two finger end-effector damages stems or other fruits. As a result, the suction pad on the harvesting end effector was used to separate the objective fruit from the other fruits. Since the tomato peduncle contains a joint, picking the fruit by bending the wrist instead of cutting it was used. The manipulator was controlled to have a
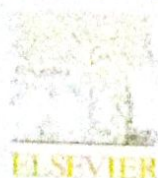
Analysis of MEMS cantilever sensor for sensing volatile organic compounds

B. Guruprasad , M.G. Veena

Department of E and C, JSS Science and Technology University, Mysuru, Karnataka, India

A B S T R A C T

Increased concentration of Volatile Organic Compound (VOC) in environment can cause severe health issues and create the ozone layer at ground level. The increased concentration of ozone at the ground level creates the smog which will affect the biodiversity of mother earth, environment and human health in many ways. Many researchers have persuaded the continuous research on miniaturized sensors to detect the VOC with high sensitivity and selectivity. This paper presents the design and fabrication of MEMS cantilever sensor to sense VOCs viz., acetone (C_3H_6O) and Isopropyl alcohol (C_3H_8O). Here, the metal oxide films of Poly-vinyl-pyrrolidone (PVP) and Amino-propyl-tri-ethoxy-silane (3-APTES) having 600 nm thickness is deposited on oxidized p-type Si surface by RF sputtering process. The cantilever structure of 128 µm length, 80 µm width and thickness 600 nm is designed having a sensor area of 10,240 µm^2. With this design specification the sensor is simulated in COMSOL Multiphysics software. Then, the sensor is fabricated using surface micromachining technique. The detection of VOCs is carried out by omnicant instrument. Here, the detection sensitivity of PVP and 3-APTES towards Acetone and Isopropyl alcohol are analyzed. The experimental results show that, PVP coated sensor performs 39% increase in sensitivity as compared to 3-APTES coated sensor to detect acetone, and 3-APTES coating sensor exhibit 7.5% increase in sensitivity to detect Isopropyl alcohol as compared to PVP coated sensor.

1. Introduction

Harmful chemicals which are released by human industrial activities, artificial adhesives and paints used in daily life reduce the indoor air quality and cause severe risk to human health [   ]. Adhesives, paints and vehicles exhausts are the major sources of VOC emission. The VOCs emitted by these activities are the major dangerous chemicals which affect the human health. Many countries are formulating the legislations to control the release of VOC to environment. Many sensors have been developed to detect the VOCs present in the environment but the size of the available sensors is not potable and are highly expensive. There is a need to develop the sensors in the micro scale to detect the VOCs present in the environment. Metal oxide semiconductor, using zinc oxide (ZnO) coating material was the major type of technique which was used for chemical sensing by many researchers [   ]. Meanwhile, research is continuously perusing to increase the response of nanomaterial-based sensor for VOC detection [   ]. MEMS based gas sensor with tin dioxide (SnO2) and ZnO sensing films used to detect ethanol and benzene [   ]. Suspended Copper doped Zinc oxide nano rods were used along with microheater to sense the indoor VOC tested against toluene [   ]. Ferrous doped Indium oxide were fabricated for discriminative detection of VOC [   ]. In this research work the MEMS cantilever sensor is developed with a material coating of PVP and 3-APTES to detect the VOCs viz., acetone and Isopropyl alcohol. Presently, the 3-APTES coating material is used for the first time on the piezoresistive cantilevers to sense the selected VOCs. This coating material has showed good sensitivity for Isopropyl alcohol as target gas.

2. Design and fabrication

The MEMS cantilever is designed in COMSOL Multiphysics 5.0. The dimension of the cantilever is 128 µm length, 80 µm width and 600 nm thickness, On the designed cantilever, metal oxide film is coated having a thickness of 250 nm and for sensor square area of 10,240 µm^2. The schematic diagram of designed cantilever is shown in   . When the target gas come in contact with this metal oxide, the surface deformation of cantilever take place. This minute deflection is measured as a function of change in resistance of read out circuit interfaced with the MEMS cantilever.

The designed cantilever is fabricated using standard surface

* Corresponding author.
  E-mail address: (B. Guruprasad).
¹ IEEE member.

Siddesh

H. O. D.
Dept. Of Electronics & Communication
Alva' Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

4

Analysis of hybrid nano composite pva-pdms thin films for hydrophobic applications

Guruprasad B[1] , Veeraprathap veerabhadraiah[2], Shwetha M S[3]

[123]*Department of E and C, Alva's institute of engineering and technology, Moodbidri-574227*

ABSTRACT

In the present study, electrical and physical properties of Polydimethylsiloxane (PDMS) and polyvinyl alcohol (PVA) polymer were combined with zinc oxide (ZnO) and silicon dioxide (SiO_2) nanoparticles to form the zinc silicate ($ZnSiO_3$) hybrid nanocomposites thin films using sol-gel process. The samples were prepared with a ratio of 50:48:02 and named as P_0, P_1, P_2, P_3 and P_4. The electrical properties such as ac conductivity (σ_{ac}) dielectric constant (ε_r) and dissipation factor (tan δ) of developed PDMS/PVA/$ZnSiO_3$ nanocomposites thin films were studied using high frequency LCR meter with a frequency range from 100Hz to 1MHz. From the physical properties, the surface hydrophobicity of the thin films was studied using contact angle meter measurement and it was inferred that the films are hydrophobic in nature with increase in the nanofiller content. The Scanning Electron Microscopy (SEM) was used to examine the surface morphology of the developed films. The X-ray diffraction (XRD) was used to investigate the structure and crystalline size of the nanoparticles within the nanocomposite films. These nanocomposites thin films are used in hydrophobic materials like waterproof covers and waterproof glass surfaces.

Keywords *– Sol-gel, hybrid nanocomposites, hydrophobicity, electrical properties, crystalline size*

MEMS based metal oxide semiconductor carbon dioxide gas sensor

H.R. Shwetha , S.M. Sharath , B. Guruprasad , S.B. Rudraswamy

[a] Department of Electronics & Communication Engineering, J. N. N. College of Engineering, Shivamogga 577204, India
[b] Department of Electronics & Communication Engineering, Sri Jayachamarajendra College of Engineering, Mysuru 570006, India
[c] Department of Electronics & Communication Engineering, Alva's Institute of Engineering Technology, Moodbidri 574225, India

ARTICLE INFO

ABSTRACT

This paper describes the design and development of low power Micro Electro Mechanical Systems (MEMS) microheater and metal oxide semiconductor CO_2 sensor. To achieve low power, suspended plasma enhanced chemical vapour deposited SiO_2 diaphragm is used. $BaTiO_3$-CuO is considered as metal oxide doped with 1% Ag and will be used as a sensing material to sense the CO_2 gas. To get the required temperature for the sensing film, three different metals namely, Platinum (Pt), Titanium (Ti) and Tungsten (W) are simulated by using COMSOL Multiphysics 5.6. The proposed microheater structure is shown to have a good temperature consistency throughout the heater's active region while consuming low power. The microheater geometry of 100 μm × 100 μm with its electro-thermal temperature results is presented here. For an applied voltage, we report a maximum average temperature of Pt i.e. ~99.51%, Ti ~ 97.12% and W ~ 89.78% for 300 °C respectively. Fabrication of CO_2 sensor along with MEMS microheater had been designed and demonstrated. Energy consumed by the proposed platinum microheater geometry is 4.8 mW at 250 °C and 5.8 mW at 300 °C. The sensitivity characteristic is based on resistance sensing which has been found to be 21% for 400 ppm CO_2 gas concentration and 70% for 1000 ppm. Comparatively capacitive based sensitivity is found to be ~54% for 400 ppm and 95% for 1000 ppm.

1. Introduction

Man-made activities such as manufacturing industries, vehicles and chemical-intensive agriculture produce hazardous substances and have a substantial impact on human health and the green environment. Hazardous gases include carbon monoxide, carbon dioxide, methane, nitrogen dioxide, and many others that negatively impact the environment. Carbon Dioxide (CO_2) makes a harmful impact on the ecosystem by causing acid rain, rising global temperature and eventually affecting human health. Therefore, carbon dioxide has traditionally been recognized as one of the most serious atmospheric pollutants. Indoor air quality monitoring and the Internet of Things (IoT) in smart homes, cities and the healthcare sector are creating a demand for miniaturised, low-cost CO_2 gas sensors in the marketplace [ ].

Infrared and optical-based carbon dioxide gas sensors have been examined as recent breakthroughs. All the current solutions are designed for indoor use and they can detect CO_2 concentration levels ranging from 30 to 70 ppm. We are working on a sensor for environmental applications that can detect CO_2 levels up to 1000 ppm. gives the comparison of commercially available CO_2 sensors [ ]. When

comparing conventional gas sensors to Metal Oxide Semiconductor (MOS) based gas sensors, the most prevalent issue is that other types of sensors consume more power and are more expensive.

Therefore, reliable and cost-effective low power CO_2 gas sensors are desirable. In this regard, various research groups have been working on different sensing technologies in order to develop low-cost, low-power, and miniaturised sensors. MOS-based sensors have shown to be effective in meeting the parameters listed above. Researchers have to come up with the research findings on modelling of gas sensors, selection of material for sensing film, morphologies of the sensing film and other various aspects to improve the sensitivity and selectivity of the gas sensors [ ]. Shravanti Joshi et al. observed a significant improvement in selective CO_2 gas detection by utilising p-type CaO and n-type ZnO heterostructure. The structure is synthesised at 50 °C from the conversion of $Zn5(CO_3)_2(OH)_6$ using $Ca(OH)_2$. In dry and humidified circumstances, the enhanced gas sensing performance is obtained at an optimum temperature of 150 °C for 500 ppm of CO_2 gas concentration [ ]. Abhishek Ghosh et al. describes the better CO_2 detecting features using a ZnO dopped with calcium thin film. The cross-sensitivity of target gas was observed with H_2 and CO gases. The best CO_2 sensor

* Corresponding author.
E-mail addresses: (H.R. Shwetha),   (S.M. Sharath),   (S.B. Rudraswamy).

Siddes

H. O. D.
Dept. Of Electronics & Communication
Alva' Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

6

Smart Child Rescue System

Vijetha T S[1], Mohan Kumar P[2], Nithish Kumar[3], R Sriram[4], Ramya Madhukar Nayak[5]

[1]*Assistant Professor, Department of Electronics and Communication Engineering*
[2,3,4,5] *Students of Electronics and Communication Engineering*
Alva's Institute of Engineering And Technology, Mangalore Dakshina Kannada

---***---

Abstract - A water well or borewell is an excavation or building made in the ground by digging, boring, or drilling to access groundwater in underground aquifers. Nowadays, it is rather common to observe abandoned borewells that have been left open after usage. These walls turn into a deadly trap for young children who play close to the wells without realizing their depth. The task of rescuing children who have become trapped inside the borewell is not only challenging but also dangerous. The rescue teams attempt to save these young children for hours, sometimes days, and it costs a lot of money. Consequently, technology must be used to improve the rescue effort.

Key Words: underground aquifers, abandoned , excavation .

1. INTRODUCTION

One of the prevalent problems in several regions of India nowadays is kids slipping into bore wells. Children falling into borewells most frequently occur in rural India. This reveals something about the bore hole sizes. Bore wells are drilled in cities for domestic consumption. They have a smaller diameter. Large-diameter bore wells are also dug by some manufacturing businesses. These would often be found in the villages. This, however, cannot be regarded as the main cause since in the villages, people look for groundwater for household, agricultural, and other uses. People need water, but it is not always readily available, so they dig a borewell. Consequently, groundwater is the source. And thus, work on drilling a deep borewell to reach a decent source level of ground water begins. For a number of reasons, including the summer, excessive extraction, inadequate recharge, etc., groundwater is

vital. However, a large number of bore wells don't supply water and are frequently left open.

When there is no longer any water, the driller will partially plug the hole and pack up and leave. One day a wandering youngster unknowingly plunges into the borewell, considering a toddler may easily fall into a borewell due to its diameter. If the youngster is not located elsewhere, it takes a long time to realize that they have fallen into a borewell. Since there won't be any use for the borewell owing to a shortage of water, it may potentially collapse. Since some borewells may reach depths of more than 300 feet, a youngster can stay caught in the muck instead of always falling to the bottom. Finding the depth of an open borewell is a difficult undertaking since the interior is quite deep and dark. However, if the youngster has fallen into a deep borewell, a web camera is sent down there to capture images of the child.

2. LITERATURE SURVEY

V. Saritha *et al.* [1] The purpose of this study is to prevent children from falling into bore-wells, which necessitates a novel design with a sensor placed above the borehole to detect children who fall within. The automated horizontal closure, which is kept at a depth of around 3 feet, closes if the device detects a child, shielding the kids from falling below. It has the capability to keep an eye on the confined youngster and to offer a platform on which the child can be raised using motors. The three blocks, which are set at an angle of 120 degrees from one another, are pushed toward the side of the bore hole by the motor, which is mounted on top of a gear mechanism. The clipper will then be used to rescue the youngster who is trapped within the hole by picking him or her up and placing them with the aid of a remote control. The rope fastened at its hands is used to manually insert the clipper. This scenario states that

A REVIEW ON VOICE CONTROLLED WHEELCHAIR WITH OBSTACLE SENSOR AND THERAPY UNIT

Vijetha T S[1]*, Madhu K[2], Jeevan C M[3], Harshitha R shetty[4], Gagan K[5]

[1-]Assistant Professor, Department of Electronics and Communication Engineering
[2,3,4,5-]Students of Electronics and Communication Engineering, Alva's Institute of Engineering and Technology, Mijar

Abstract: This paper presents the design of an automated wheelchair with voice control. The main objective of this campaign is to promote voice control of wheelchairs for individuals who need it. The system's safe mobility is enhanced by additional features including obstacle identification that reduce the likelihood of accidents while travelling. This gadget also features a component for therapy that helps the user's limbs avoid becoming numb after extended rest.

Keywords-wheelchair, voice, obstacle, disability, therapy

I. INTRODUCTION

Inspiring and admirable effort has been done by many researchers to make patients' life as simple and independent as possible. The fact that physically challenged patients can hardly move and must use a wheelchair is one of their major limitations. A controller is now built into certain wheelchairs, making them more modern. This type of wheelchair can be useful for patients who have functional upper limbs but little control over their bottom limbs. In today's world, speech recognition is a hot topic. Speech recognition has a wide range of uses that improve the quality of our lives. However, for wheelchair remained a notable barrier. As a result, an intelligent wheelchair system based on voice recognition is suggested. The voice-activated wheelchair is built with safety features to prevent collisions with obstacles and can be operated via voice commands. The primary goal of this system is to be able to recognise speech as accurately as possible. Speech recognition is the process of turning spoken words into forms that computers can understand. This intelligent wheelchair incorporates speech recognition, so when a command is given verbally, the system will carry it out as instructed. It has a therapy machine to help the crippled person's limbs and prevent numbness from being brought on by prolonged rest. Through this approach, disabled people can receive some therapies alone. Through the use of their voice commands, those who are physically disabled or socially isolated will be able to move around freely and independently like other members of the community. This paper discusses the creation of a system that uses an infrared sensor, Raspberry Pi, Google Assistant, servo motor, and an Android handset as a microphone.

II. LITERATURE SURVEY

[1] Muhammad Azlan Alim, et al. In this proposed system, a voice-activated intelligent wheelchair device for those with physical disabilities who are unable to steer with their limbs. This innovation uses voice commands to control the wheelchair's mobility in various directions. The Android device serves as a microphone to connect to the Google Assistant before the Raspberry Pi processes the data. The servo motors will subsequently be given the appropriate instructions by the Raspberry Pi. Through the employment of an infrared sensor, this technology provides automated obstacle detection and assists the operator in applying the temporary stop button when the impediment is detected. The trial findings of more than 90% accuracy and a reaction time of less than 1.2 seconds confirm that it is a trustworthy system for usage by disabled individuals. The dual-controller mode further highlights its importance for users who have limited control over one or both of their lower limbs. This wheelchair also has a user-friendly mechanism since it doesn't require any special training or user restrictions to use.

[2] Ms. Cynthia Joseph, et al. In this proposed system, The device is built on a design that incorporates manual operation to let physically challenged persons use voice activation. Voice recognition software and an Arduino microcontroller have been utilised to facilitate wheelchair mobility. An improper spoken command does not cause the wheelchair to move. The Arduino controls the wheelchair directions in accordance with the instructions provided by voice and gesture. Obstacle detection is performed via ultrasonic sensors. The prototype's layout makes it possible to utilise it effectively and without much effort on your own. It helps consumers save time, money, and energy. Ultrasonic sensors are effective at detecting any obstruction. The prototype begins to move as soon as the user turns it on, and any impediment that is anticipated to be within a specific range will be picked up. Older because of their independence. [3]M.Senthil Sivakumar, et al. In this proposed system, They suggest a wheelchair, speech module, and navigation module for the Intelligent Home Navigation System (IHNS). An older person or someone with physical limitations can easily move around the house using their method. The wheelchair is controlled automatically or manually in the suggested system

WILEY | Hindawi

Research Article

Effect of Curing Temperature and Time on Mechanical Properties of Vinyl Polymer Material for Sealing Applications in Industry Using Machine Learning Techniques

Sudheer D. Kulkarni ●,[1,2] B. Manjunatha,[3] U. Chandrasekhar,[4] G. K. Siddesh ●,[5] Haiter Lenin ●,[6] and Sujin Jose Arul[7]

[1]New Horizon College of Engineering, Visvesvaraya Technological University, Bangalore, India
[2]Department of Industrial Engineering and Management, Ramaiah Institute of Technology, Bangalore 560054, India
[3]Professor, Department of Mechanical Engg, New Horizon College of Engineering, Bengaluru, Karnataka, India
[4]AddWize-Wipro 3D, Bangalore 560058, India
[5]ECE Department and Deputy Dean Research, ALVA'S Institute of Engineering and Technology, Moodbidri, DK, Karnataka, India
[6]Department of Mechanical Engineering, WOLLO University, Kombolcha Institute of Technology, Kombolcha, Ethiopia Post Box No: 208
[7]Department of Automobile Engineering, New Horizon College of Engineering, Bangalore, India

Correspondence should be addressed to Haiter Lenin; haiter@kiot.edu.et

A seal is a mechanism or a piece of material that securely shuts a hole so that air, liquid, or other substances cannot enter or exit the system. Seals are an essential component of practically all machinery and engines and have several applications in industry. The development of novel materials for sealing applications is essentially required on these days. In this research, an attempt is made to find the polymer material for the said application. Poly vinyl rubber material has been taken, and the specimens are prepared for testing the tensile properties and hardness. The specimens were prepared by using die with various temperatures and curing time. Sixteen specimens were prepared by changing the curing temperature, curing time, postcuring temperature, and postcuring time. The curing temperature 150°C and 170°C, postcuring temperature 100°C and 50°C, curing time 14 mins and 18 mins, postcuring time 120 mins and 60 mins, and the pressure of 150 kg/cm² for all the specimens were maintained. The tensile strength and hardness analysis were done as per the ASTM standard, and it was found that the specimen prepared on 150°C curing temperature, 18 min curing time, 50°C postcuring temperature, and 120 min postcuring time provides the higher tensile strength. DOE analysis is also done to determine the best values of the factors impacting the mechanical characteristics of the seal material. Simple regression analysis is used to find the influence of curing temperature and curing time on the tensile strength and hardness for every 1°C temperature rise and 1 sec curing time.

1. Introduction

A versatile and cost-effective material, "polyvinyl chloride (PVC, or vinyl) is used in plumbing and siding, blood bags, tubing, wire and cable insulation, windshield system components, and more, in the building and construction, health care, electronics, automobile industries, and others." Vinyl can range in hardness from plastic wrap to industrial pipes to thin and flexible wall covering. Additionally, it can be completely translucent or colored to any desired shade. The majority of vinyl produced is employed in long-term building and construction applications—roughly 75%. PVC/vinyl is advantageous for environmental protection because of its low greenhouse gas emissions and ability to conserve resources and energy, according to life-cycle studies. Since vinyl is strong and resistant to moisture and

ACTOR CRITIC APPROACH BASED ANOMALY DETECTION FOR EDGE COMPUTING ENVIRONMENTS

Shruthi N[1] and Siddesh G K[2]

[1]Department of Electronics & Communication, BNMIT, Bangalore, Karnataka, INDIA
[2]Research Head, New Horizon College of Engineering, Bangalore, Karnataka, INDIA.

ABSTRACT

The pivotal role of data security in mobile edge-computing environments forms the foundation for the proposed work. Anomalies and outliers in the sensory data due to network attacks will be a prominent concern in real time. Sensor samples will be considered from a set of sensors at a particular time instant as far as the confidence level on the decision remains on par with the desired value. A "true" on the hypothesis test eventually means that the sensor has shown signs of anomaly or abnormality and samples have to be immediately ceased from being retrieved from the sensor. A deep learning Actor-Criticbased Reinforcement algorithm proposed will be able to detect anomalies in the form of binary indicators and hence decide when to withdraw from receiving further samples from specific sensors. The posterior trust value influences the value of the confidence interval and hence the probability of anomaly detection. The paper exercises a single-tailed normal function to determine the range of the posterior trust metric. The decision taken by the prediction model will be able to detect anomalies with a good percentage of anomaly detection accuracy.

KEYWORDS

Reinforcement Learning, Actor Critic, Security, Anomaly Detection, Posterior Belief

1. INTRODUCTION

Information and computing are ubiquitous in the sphere of communication. One may refer to information being available and handled at the user devices while the other may refer to the information at the core cloud infrastructure. Information also gushes its way through various intermediate communication networks and servers. Challenges of IoT (Internet of Things) based networks like real-time massive data generation, heterogeneous data, dynamic demeanor networks, constrained memory, and resources are still difficult to elucidate. However, the commendation goes to researchers who have shed light on how to effectively glean embedded intelligence features from Machine Learning (ML), and Deep Learning (DL) techniques to incorporate them in IoT devices and networks.

There will an explosive growth in computationally expensive sensor data due to the erratic rise in sensory devices like wearable devices, smart phones, daily use appliances, vehicles, etc., Data analysis and computing will be highly challenging. Captured data will most of the time be of high dimension. Network handling capacity and handling delay mitigation requirements will pose stringent challenges too. Real-time inferences and responses are critical in a majority of applications. With more and more data being generated from the physical world, there is a definite boost in bottlenecks concerning network bandwidth and transmission speed too.

Siddesh

53

Construction and Evaluation of Deep Neural Network-based Predictive Controller for Drug Preparation

Author(s): K. Sheela Sobana Rani, Dattathreya, Shubhi Jain, Nayani Sateesh, M. Lakshminarayana and Dimitrios Alexios Karras *

[15]

* (Excluding Mailing and Handling)

The evaporator used in the pharmaceutical industry is for drug preparation. The purpose of the evaporator in drug manufacturing is to extract the water content in the material through the heating process. In this research, the SISO evaporator is taken, which contains temperature as input and dry matter content as output. The mathematical modelling of the drug preparation evaporator is done with the help of the system identification method. Controlling and maintaining the temperature inside an evaporator is a tedious process. In this regard, the Neural Network predictive controller (NNPC) is designed and implemented for drug preparation. It helps to predict the future performance of the evaporator and tune the control signal based on that. The setpoint tracking challenge is given to the designed controller. For analysing the performance of the controller, the error metrics, such as integral square error (ISE), integral absolute error (IAE), integral time square error (ITSE), and integral time, absolute error (ITAE), are employed. The time-domain specification, such as rise time, settling time, and overshoot, is also used to better understand controllers performance. From the above two analyses, the conclusion is made that the predictive controller is performing well in comparison with the conventional PID controller in the drug preparation pharmaceutical industry.

Keywords:

Related Journals

Recent Progress in Space Technology (Discontinued)

View More

Related Books

Recent Advances in Renewable Energy

View More

Siddesh

H.O.D.
Dept. Of Electronics & Communication
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574

3-D Modelling of Mems Based Micro-Cantilever Vibration Sensor

D.V. Manjunatha[1], Veeraprathap[2], Bhagyashree. K[3], Ansha Pathibha[4]

Abstract: A micro-cantilever is a form of active, chemical, or biological sensor that detects subtle changes in parameters including frequency, load, stress, and strain. Cantilever behaviour varies subtly with even the tiniest changes in its parameters, making it highly significant in the field of sensors. The vibration sensor is an epitome of a cantilever application. Every instrument has its own natural frequency, and deviation from this frequency causes changes in the cantilever's characteristics. This resonance frequency is determined by simulations, for a certain cantilever beam design and piezo-electric material (PZT-lead zirconate titanate). To achieve a resonance frequency, micro-cantilever modelling and simulation are used. The piezoelectric cantilever beam was made of PZT material, which was subsequently covered with Cr-Au IDE (inter-digitated-electrodes).The mechanical and electrical properties of the cantilever beam were examined during the analysis. The simulation results obtained for the micro-cantilever with a dimension of 35 mm length, 6mm width and 0.5 μm thickness showed resonance frequency of 310Hz and voltage output of nearly 48mV, for a dimension of 40mm length, 6mm breadth, and 0.5m thickness, the resonance frequency of 273Hz and voltage of 38.2mV were obtained, and the resulting simulated values form a bell-shaped curve, which gives us the resonant frequency of the proposed cantilever construction.

Keywords: Vibration sensor, Cantilever beam, PZT (lead zirconate titanate), Resonant frequency

1. Introduction

MEMS-based devices have been used in a wide range of technologies in recent years. Including inertial navigation systems, Wireless connectivity, medical devices, pressure sensors such as accelerometers and other piezoelectric devices are used. Inorganic piezoelectric materials, such as most prevalent piezoelectric materials are Lead Zirconate Titanate (PZT3). During the last few decades, many micro-cantilever-beam-based MEMS (micro-electromechanical systems) devices such as, sequence-specific DNA sensing, the atomic force microscope (AFM), single electron spin detection, mass sensors, chemical sensors and pressure sensors, have become commonplace in modern technologies. Scanning probe instruments, detection instruments, force measurements, magnetic spin detection, and heat measurement all mainly depends on micro-cantilever rays are deflection [1, 2]. Tension, compression, torsion, and bending are examples of simple stress states which are commonly utilized to compute strain and stress observable forces and displacements in the study of mechanical behaviour of materials. However, because of the difficulties in structural dimensions, manufacturing and maintaining small weights and displacements required in such conditions, such a method cannot be

applied in MEMS, as a result, designers prefer to use design calculations before spending in expensive fabrication techniques [2, 3, and 4]. Synthesizing a durable MEMS device, ensuring that the vibration sources resonate with the structure. Tackling unpredictable ambient vibrations are an issue, and satisfying the minimum electrical energy required are only a few of the problems. In order to generate usable electrical energy for powering Microsystems, it is important to optimize the performance [3], if an electric field is applied across the sensor, one plate will expand and the other will contract. As a result, stress develops in both plates, causing bending deformation throughout the structure. Also, if the applied force or a pressure to the cantilever's tip, the upper plate develops compressive strain while the bottom plate develops costly strain. Therefore, negative charge develops on the upper plate and a positive charge develops on the bottom plate. due to their capacity to generate a wide range of sensors, cantilever sensors have steadily gained favour in many scientific applications in modern years [4]. Electrical energy can be generated from ambient mechanical vibration, Wireless sensor networks, chemical sensors, and health monitoring are all examples of applications where vibration energy is utilized effectively and converted into electrical energy. Three electromechanical transduction techniques are used to convert energy piezoelectric, electrostatic, and electromagnetic, because of the ease of design and increased conversion efficiency, piezoelectric sensors have influenced a lot of

[1,2,3,4]Department of Electronics & Communication Engineering, Alva's Institute of Engineering & Technology, Moodbidri, Dakshina Kannada.
dvmanjunatha@gmail.com, veeraprathap2001@gmail.com,
bhshree13@gmail.com, anshaprathibha@gmail.com

INDIAN JOURNAL OF SCIENCE AND TECHNOLOGY

Check for updates

* Corresponding author.

Intermediate Learning-Based Attention Regulated Densenet for Diagnosis of Covid-19

Roshan Shetty[1]*, S N Prasad[2], D V Manjunatha[3], V Veeraprathap[4], Vasudev Shahapur[5], M S Shwetha[6]

1 Reaserch Scholar, School of ECE, REVA University. Bengaluru & Dept. of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
2 Department of Electrical and Electronics Engineering, Manipal Institute of Technology Bengaluru, Manipal Academy of Higher Education Manipal, 576104, Karnataka, India
3 Sr.Professor, Department of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
4 Department of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
5 Department of CSE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
6 Department of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India

Abstract

Objectives: The AI-based Computer-Aided-Diagnosis of Chest X-Rays related to COVID-19 is very essential. Here we present an Attention regulated Pre-trained DenseNet-121 with intermediate transfer learning as a Chest X-Ray image classifier to classify images according to three labels: COVID-19, pneumonia, and normal. **Methods**: We are proposing a new Attention regulated ImageNet pre-trained DenseNet-121 neural network architecture, which is retrained on NIH ChestX-ray14 data as an intermediate database before the actual COVID-19 database. We also fine-tuned the last layer of this neural network with a suggested novelty called the output neuron-keeping technique. Before feeding the Covid-19 data we removed all other neurons corresponding to Chest X-ray14 pathology classes except the "No finding" and "Pneumonia" classes. A new third neuron with random weights and bias is created in the final layer to detect Covid-19 pathology. A DenseNet-121 is supported by a GRAD-CAM-based attention mechanism in achieving detection accuracy and localization of pathologies. The used Covid-19 dataset is a combination of 370 Pneumonia, 1255 Normal, and 439 COVID-19 Chest X-Ray images. We randomly took 50 pictures from each class for testing purposes, the remaining images are augmented more to improve DenseNet performance on a small COVID-19 dataset. **Findings**: Our state-of-art model achieved 98.6% test accuracy since it misclassified one out of 50 Covid-19 images, and one out of 50 Pneumonia images, but all 50 normal Chest X-Ray images are classified with 100% accuracy. We compared our model with the other three state-of-the-art models, particularly under three-class classification problems (Pneumonia,

Siddesh

H. O. D.
Dept. Of Electronics & Communication
Alva' Institute of Engg. & Technology
Moodbidri, DAKSHINA KANNADA - 574 22°

SPRINGER LINK

International Conference on Sustainable and Innovative Solutions for Current Challenges in Engineering & Technology

ICSISCET 2022: **Artificial Intelligence and Sustainable Computing** pp 93–103

Analysis of Humidity Effect on Sensitivity of MEMS Cantilever Sensor

B. Guruprasad, M. S. Shwetha ✉, Arjun Sunil Rao & D. V. Manjunath

Conference paper | First Online: 24 September 2023

13 Accesses

Abstract

Micro Electro Mechanical Systems have become very famous and future trend research from the past decade. This research field has a wide range of applications in automotive, biomedical and chemical gas sensing. Many researchers used different sensing principles to design MEMS sensors. Piezoresistive MEMS cantilever is the most widely used structure for gas sensing application. The process of developing the MEMS sensing system includes design, fabrication and characterization of cantilever structure to sense the target gas. The sensitivity of the developed cantilever sensor for the detection of target gas depends on the material property, Limit of Detection (LOD) of the testing instrument, humidity, geometry of the structure, surface area, thickness of coating material, and porosity of the target gas and kinematics of the target gas reaction. This paper focuses on the experimental study on the effect of humidity, thickness of coating material, LOD of the testing instrument and kinematics of sensing mechanism on the sensitivity of the MEMS cantilever sensor. For the experimentation, the Volatile Organic Compounds (VOCs) viz., Ethanol, Toluene, Acetone and Isopropyl alcohol are taken as target gases and the PVP, 6-MNA, 4-MBA and 3-APTES are taken as coating materials on cantilever sensor. The experimentation is conducted in MEMS cantilever testing instrument omnicant.

MEMS   **VOC**   **Omnicant**   **Cantilever**

⌄ Chapter	EUR 29.95	⌄ eBook	EUR 234.33
	Price includes VAT (India)		Price includes VAT (India)

- Available as PDF
- Read on any device
- Instant download
- Own it forever

- Available as EPUB and PDF
- Read on any device
- Instant download
- Own it forever

Buy Chapter   Buy eBook

⌄ Hardcover Book	EUR 279.99
	Price excludes VAT (India)

Home > Physical Sciences > Perovskites > Materials > Materials Science > PZT

Article

Simulation & analysis of PZT/ P (VDF-TrFE) cantilever beams for health monitoring of building and structures

Authors:

Sushanth Anil Lobo

D V Manjunatha

Jayarama A.
Alvas Institute of Engineering and Technology

Richard Pinto
Alvas Institute of Engineering and Technology

Request full-text   Download citation   @ Copy link   ⌄

ⓘ To read the full-text of this research, you can request a copy directly from the authors.

References (18)

Abstract

The design of a piezoelectric PZT/P(VDF-TrFE) based Microelectromechanical system cantilever beams for a very low frequency applications, using silicon bulk-micromachining technology is described in this paper. The natural frequencies of cantilever beams were calculated using the COMSOL software. For signal output, the cantilever-beam structure contains a layer of PZT/P(VDF-TrFE) as well as chrome-gold interdigitated electrodes. According to the simulation results, the cantilever-beam with dimensions of 10mmx3mmx5μm has a lowest resonant frequency of 95.56 Hz, implying that PZT/P(VDF-TrFE) is an appropriate piezoelectric material for really low frequency uses such as building and structure health monitoring.

Sponsored videos

No full-text available

Siddesh

H.O.D.
Dept Of Electronics & Communication
Alva' Institute of Engg. & Technology
Nijar, MOODB... 574 225

Citations (0)   References (18)

15

INDIAN JOURNAL OF SCIENCE AND TECHNOLOGY

* Corresponding author.

roshan564956@gmail.com

Intermediate Learning-Based Attention Regulated Densenet for Diagnosis of Covid-19

Roshan Shetty[1]*, S N Prasad[2], D V Manjunatha[3], V Veeraprathap[4], Vasudev Shahapur[5], M S Shwetha[6]

1 Reaserch Scholar, School of ECE, REVA University. Bengaluru & Dept. of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
2 Department of Electrical and Electronics Engineering, Manipal Institute of Technology Bengaluru, Manipal Academy of Higher Education Manipal, 576104, Karnataka, India
3 Sr.Professor, Department of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
4 Department of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
5 Department of CSE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India
6 Department of ECE, Alva's Institute of Engineering & Technology, Moodbidri, Karnataka, India

Abstract

Objectives: The AI-based Computer-Aided-Diagnosis of Chest X-Rays related to COVID-19 is very essential. Here we present an Attention regulated Pre-trained DenseNet-121with intermediate transfer learning as a Chest X-Ray image classifier to classify images according to three labels: COVID-19, pneumonia, and normal. **Methods**: We are proposing a new Attention regulated ImageNet pre-trained DenseNet-121 neural network architecture, which is retrained on NIH ChestX-ray14 data as an intermediate database before the actual COVID-19 database. We also fine-tuned the last layer of this neural network with a suggested novelty called the output neuron-keeping technique. Before feeding the Covid-19 data we removed all other neurons corresponding to Chest X-ray14 pathology classes except the "No finding" and "Pneumonia" classes. A new third neuron with random weights and bias is created in the final layer to detect Covid-19 pathology. A DenseNet-121 is supported by a GRAD-CAM-based attention mechanism in achieving detection accuracy and localization of pathologies. The used Covid-19 dataset is a combination of 370 Pneumonia, 1255 Normal, and 439 COVID-19 Chest X-Ray images. We randomly took 50 pictures from each class for testing purposes, the remaining images are augmented more to improve DenseNet performance on a small COVID-19 dataset. **Findings**: Our state-of-art model achieved 98.6% test accuracy since it misclassified one out of 50 Covid-19 images, and one out of 50 Pneumonia images, but all 50 normal Chest X-Ray images are classified with 100% accuracy. We compared our model with the other three state-of-the-art models, particularly under three-class classification problems (Pneumonia,

A Review: Wireless Sensor Network Based Landslide Detection

Roshan Shetty[1], Nayana G [2], Nadiya N [3], Thanushree M [4], Pavitra Kambar[5]

[1]Assistant Professor, ECE, AIET, Mangalore, India

[2345]UG Scholar, Dept of ECE, AIET, Mangalore, India

***

Abstract - Wireless sensor networks, which allow for real-time monitoring of areas that are disaster-prone, are one of the most promising new technologies. Massive solutions for real-time monitoring at scale have been made available because to the promise of wireless sensor network technology. Landslides are a serious geological danger that occur when substantial amounts of rock, mud, and debris slide down a steep slope during periods of intense rain and rapid snowmelt. This study shows the potential of wireless sensor networks for disaster mitigation by focusing on landslide detection. Real-time monitoring requires the design, development, and deployment of a wireless sensor network (WSN), as well as the development of the essential algorithms for efficient data collection and data aggregation.

Key Words: Flex sensor, Bluetooth, Accelerometer, Landslide.

1. INTRODUCTION

Environmental disasters typically come about without warning and happen quickly. A landslide is a sort of mass wasting that can happen in offshore, coastal, and onshore environments due to gravity. It can encompass a wide range of ground movements such rock falls, deep slope failures, and shallow debris flows. An unstable but potentially harmful event is a landslide. Toe cutting, a steep slope angle, and saturated soil are its contributing causes. In a location thought to be unstable due to a history of landslides, these elements are more probable. It is possible to quickly capture, process, and transmit important data in real-time with high resolution using wireless sensor network (WSN) technology. However, it has some drawbacks, namely the comparatively small volumes. However, compared to many other technologies already in use, it has its own drawbacks, such as low memory availability and relatively low battery power. Landslide detection is the only problem that currently has a solution. An alarm is sent off when a trip wire put along landslide-prone areas breaks because of falling rocks and debris. Although this method of landslide detection is less expensive, it is ineffective at alerting people to an impending landslide.

A control unit that oversees the system's entire operations makes up the landslide early warning and monitoring system. A microcontroller such as an Arduino board, an ESP8266 board, an ESP32 board, or any other application-specific board created for monitoring purposes can serve as this control unit. The effectiveness of these boards depends primarily on the number of sensors being used, as well as their internet connectivity for presenting or graphing the collected data online. A control unit that performs better and responds more quickly must be used if there are more sensors being used. If internet access is necessary, a control unit that supports this capability must be used.

2. LITERATURE SURVEY

Garje et al [1] have presented a development of Wireless Sensor Networks (WSNs) with integrated different sensors was used in lab tests to identify landslides. Major alterations to the earth's natural ecosystem are caused by landslides. WSN is another trustworthy and reasonably priced new technology that allows for real-time surveillance across great distances and challenging terrain. To scan heterogeneous data with a digital sensor, the multipurpose Integrated Risk Information System (IRIS) remote was connected to a wireless module in this instance. One may track the movement and acceleration of the slide and take corrective action by studying the data the system generates.

Ramesh et al [2] have presented the implementation of WSN in a real-time system for landslide detection and warning systems. A landslide is when rocks and earth slip downhill. This can endanger lives and damage property and

A Review: Innovative Home Automation Using COB AC LED

Roshan Shetty[1], Ashish Shetty [2], Abhishek Naik [3], Abdul Rasheed [4], Abhisheka M O[5]

[1]Assistant Professor, ECE, AIET, Mangalore, India

[2345]UG Scholar, Dept of ECE, AIET, Mangalore, India

***

Abstract - An up-to-date overview of various technologies which are existing to provide home automation from different sources is provided. This review covers some evolving technologies in the field of home automation using COB AC LED. A separate review on home automation and COB AC LED is provided. The use of regular LED in various domains is more expensive than the newly developed driverless AC LED, the total cost to build a driverless AC LED and the life span is much higher than the regular LED devices. This paper compared the performance of different ways of home and different ways of controlling the appliances.

Key Words: Flex sensor, Bluetooth, Accelerometer

1. INTRODUCTION

Home domotic is a technique for enabling communication between the operator and the appliances via a specific module. A module is the component that connects the controller and the appliance. "Domotic" refers to both the use of machines in place of human labour and the process of developing a device, a procedure, or a system that executes itself without human intervention. A rapid and stationary control of appliances in a busy living schedule is provided by the Home domotic.

Using a home automation system, controlled devices are frequently connected to a central smart home hub. The user interface for system control can be implemented using wall-mounted terminals, tablet or desktop computers, mobile phone applications, or Web interfaces that can be accessed remotely over the Internet.

In the lighting sector, driverless AC LED light engines are already a standard piece of merchandise. To intelligently adjust the number of LEDs in a string during a power line cycle so that the voltage of the LED string matches the instantaneous power line voltage, nearly all of them use high voltage integrated circuit switching chips. Customers, however, are calling for more efficiency, reduced prices, and most importantly, less flicker in the light that is being

produced. Using innovative circuits for AC LED light engines, Peter W. Shackle, president of the consulting firm Photalume, provides a non-dimming solution with lower costs, more efficiency, and greater light quality as perceived by the human eye.

2. LITERATURE SURVEY

According to the research done by [1], an AC-DC LED driver with an additional active rectifier was created in order to extend the lifespan and increase the efficiency of the LED. In order to absorb double-line-frequency power ripple from the ac supply, traditional ac-dc LED drivers need a huge storage capacitor, which may shorten the lifespan of LED lamps or raise the price of the lighting systems. Regarding full-load efficiency, the recommended LED driver performs better than the majority of solutions. Moreover, Config. II's auxiliary circuit's efficiency loss at $V_{cb0} = 40$ V is comparable to the value reached under full load, validating the use of low power processing on it. Be warned that the efficiency loss might, in the worst-case situation, amount to 2.8% at full load or 4.1% at half load. The efficacy may still be greatly improved, though. The conduction loss and the magnetic loss, for instance, can be further reduced by operating the auxiliary circuit in continuous conduction mode (CCM) as opposed to direct conduction mode (DCM).

In the study conducted by [2] they designed a direct AC driver to the led so that the additional components which are required in traditional LEDs can be removed hence an advantage over these LEDs can be taken. As they don't need big, expensive inductive components, direct AC LED drivers are more compact and affordable than traditional LED drivers. Current direct AC LED drivers, however, do not support TRIAC at low flicker rates. By creating a relationship between phase-cut ratio and brightness and utilizing always-on multi-arrays, this work tackles this issue and achieves both TRIAC dimmer compatibility and low percentage flicker without the use of a specific IC. A phase-cut/DC converter, a switch controller, a current regulator, and three LED arrays compensate for the suggested LED driver. Based on the outcomes of testing utilizing 15W

Siddesh

H.O.D.
Dept. Of Electronics & Communication
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

18

A Review: Vehicle Accident Detection using GPS and GSM

Dr. Roshan Shetty[1], Bhavya Y R[2], Ankita S N[3] and J V Rashmita[4]

[1]Assistant Professor, ECE, AIET, Mangalore, India [234]UG Scholar, Dept of ECE, AIET, Mangalore, India

Abstract—Using GPS, GSM, and an accelerometer, an Arduino-based vehicle accident alert system. Accelerometer detects an abrupt change in the vehicle's axis, and the GSM module sends a message alerting you to the accident site to your mobile device. The development of technology has simplified our daily life. Similar to how every coin has two sides, technology has advantages as well as disadvantages. The development of technology has increased the frequency of fatal traffic accidents. The inadequate emergency services we have in our nation only make matters worse. An answer to this issue will be offered by our project.

Keywords:- Arduino, GSM, GPS, LCD, Vibration Sensor;

I. INTRODUCTION

The introduction of a car accident warning system is a step in the right direction toward addressing the issue of inadequate emergency services for traffic accidents. The system's ability to quickly identify accidents and transmit essential information to first aid facilities and rescue crews can significantly reduce response time and save lives. The use of a GSM module and a GPS module in the system enables accurate location tracking and transmission of information to the relevant authorities. The use of a vibration sensor and a MEMS sensor allows for accurate identification of the accident and the angle at which the automobile flips over. This information is critical in ensuring that the rescue team is adequately prepared to handle the situation and provide the necessary assistance. It is essential to note that while the car accident warning system is a significant improvement, it is not a substitute for improving emergency services in the country. Efforts must be made to strengthen the emergency response system and provide adequate resources to enable quick and efficient responses to emergencies. Overall, the car accident warning system is a significant step toward addressing the issue of inadequate emergency services for traffic accidents. Its implementation can help save lives and reduce the risk to human life caused by the increasing use of automobiles.

II. LITERATURE SURVEY

Vijayakumar and P Vishnu Prasad et al [1] have suggested the suggested GPS and GSM-based car accident tracking and detection system has two primary components, the vehicle end, and the user end. The system continuously monitors the car using various sensors interfaced, including a Piezoelectric sensor transducer, MEMS, and smoke sensor, to detect if a fire accident, vehicle fall, or impact has occurred. When an accident is detected, the system quickly notifies the contact numbers listed in the software loaded into the microcontroller using the GPS module to pinpoint the site of the accident. The second component of the system consists of the Arduino Uno, a GSM module, and a GPS module. The microcontroller Atmega in the Arduino obtains the location from the GPS receiver and sends the corresponding information to the contact number mentioned in the code that is loaded in the Arduino, i.e., to near and dear ones via SMS when any of the three sensors become activated based on the level of impact. In the case of theft, the user can send an SMS to the mobile number stored inside the GSM module of the system with any text that contains the substring "Track," such as "Track Vehicle," "Track My Vehicle," and so on. The microcontroller retrieves the position information using the GPS module and transmits the information to the user's cell phone through SMS. The findings from testing the system using a microcontroller-based prototype revealed that it was successful in identifying accidents and locating the car. This system can help in the timely detection and location of accidents, which can aid in providing timely assistance to accident victims

Siddesh

H. O. D.
Dept. Of Electronics & Communication
Alva' Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

19

A Review paper on Automatic Fine Collector for Over Speeding

Bhagyashree K[1] , Abdul Gaffar[2] , Abhay Kumar[3] , Abhinandan J[4], Aditya Togarge[5]

[1]Assistant Professor , ECE , AIET , Mangalore , India

[2345]UG Scholar, ECE, AIET, Mangalore, India

--***---

Abstract - One of the key factors contributing to accidents and the loss of many lives is excessive vehicle speed. To address this issue, a proposed method was developed. The project's goal is to make a user-friendly, dependable device that can measure the speed of a vehicle using infrared sensors, display that speed on an LCD (liquid crystal display), and sound an alarm if it detects excessive speed. It utilizes a GSM module to send the SMS (chalan) to the car owner.

Key Words: Arduino UNO, IR Sensors, GSM module, RFID module, Buzzer.

1. INTRODUCTION

In many places on the highway route, accidents found a serious social concern. There are numerous causes of auto accidents. The majority of highway accidents are the result of speeding. To date, a technology called "Automatic Traffic Fine Collector For Over speeding" has been developed to solve this issue. The project's goal is to accurately track speeding vehicles utilizing RFID tags and Infrared sensors. There is an SMS sent to the vehicle owner's phone as part of our project. The traffic management personnel could successfully trace any traffic light faults using our technology in the best possible and desired way. Traffic accidents are frequent and frequently brought on by careless driving. Government records show that more than 140,000 people died on Indian roadways in the previous year. The amount of traffic in India has significantly increased as a result of inadequate traffic regulation and speed monitoring systems. An efficient solution has been created using an Arduino board outfitted with two IR sensors, an IR transmitter (IR LED), and an IR receiver to address this issue (photodiode). When a vehicle passes over the two sensors, the sensors, which are wired to the Arduino's interrupt pin, detect the interruption wave and the amount of time that passes before the internal timer sensor activates. An SMS (Chalan) is sent to the car owner using a GSM module.

2. LITERATURE SURVEY

Vishal Pande et al [1] proposed a framework for the radio frequency design of a controller to manage vehicle speed and a display to track the zones that can function on an embedded system platform for autonomous speed management of speeding cars.

Monika Jain et al [2] suggested technology is demonstrated that can spot reckless driving and alert the traffic authorities to any offenses. By using this frame of reference, a system that warns drivers about risky driving habits will be developed. In each location where the system is implemented, the police determine the speed limit based on the volume of traffic. This device manages excessive speeding violations by recording, showing, and gathering information.

Ni Hlaing et.al [3] suggested building a system that can track a car's speed on streets, main thoroughfares, and other places where drivers routinely exceed the speed limit. If the speed is higher than the allowed limit, the information is sent to a PC (Personal Computer), which turns on a camera and records the speeding vehicle.

Amarnarayan et.al [4] proposed the creation of a speed estimation system that alerts drivers to road conditions, is dependable and robust, and helps prevent automobiles from joining traffic jams is an important topic that has attracted a lot of attention recently.

Nehal Kassem et al [5] suggested a ground-breaking RF-based vehicle motion and speed detection system that can estimate

Siddesh

20

3-D Modelling of Mems Based Micro-Cantilever Vibration Sensor

D.V. Manjunatha[1], Veeraprathap[2], Bhagyashree. K[3], Ansha Pathibha[4]

Abstract: A micro-cantilever is a form of active, chemical, or biological sensor that detects subtle changes in parameters including frequency, load, stress, and strain. Cantilever behaviour varies subtly with even the tiniest changes in its parameters, making it highly significant in the field of sensors. The vibration sensor is an epitome of a cantilever application. Every instrument has its own natural frequency, and deviation from this frequency causes changes in the cantilever's characteristics. This resonance frequency is determined by simulations, for a certain cantilever beam design and piezo-electric material (PZT-lead zirconate titanate). To achieve a resonance frequency, micro-cantilever modelling and simulation are used. The piezoelectric cantilever beam was made of PZT material, which was subsequently covered with Cr-Au IDE (inter-digitated-electrodes).The mechanical and electrical properties of the cantilever beam were examined during the analysis. The simulation results obtained for the micro-cantilever with a dimension of 35 mm length, 6mm width and 0.5 μm thickness showed resonance frequency of 310Hz and voltage output of nearly 48mV, for a dimension of 40mm length, 6mm breadth, and 0.5m thickness, the resonance frequency of 273Hz and voltage of 38.2mV were obtained; and the resulting simulated values form a bell-shaped curve, which gives us the resonant frequency of the proposed cantilever construction.

Keywords: Vibration sensor, Cantilever beam, PZT (lead zirconate titanate), Resonant frequency

1. Introduction

MEMS-based devices have been used in a wide range of technologies in recent years. Including inertial navigation systems, Wireless connectivity, medical devices, pressure sensors such as accelerometers and other piezoelectric devices are used. Inorganic piezoelectric materials, such as most prevalent piezoelectric materials are Lead Zirconate Titanate (PZT3). During the last few decades, many micro-cantilever-beam-based MEMS (micro-electromechanical systems) devices such as, sequence-specific DNA sensing, the atomic force microscope (AFM), single electron spin detection, mass sensors, chemical sensors and pressure sensors, have become commonplace in modern technologies. Scanning probe instruments, detection instruments, force measurements, magnetic spin detection, and heat measurement all mainly depends on micro-cantilever rays are deflection [1, 2]. Tension, compression, torsion, and bending are examples of simple stress states which are commonly utilized to compute strain and stress observable forces and displacements in the study of mechanical behaviour of materials. However, because of the difficulties in structural dimensions, manufacturing and maintaining small weights and displacements required in such conditions, such a method cannot be

applied in MEMS, as a result, designers prefer to use design calculations before spending in expensive fabrication techniques [2, 3, and 4]. Synthesizing a durable MEMS device, ensuring that the vibration sources resonate with the structure. Tackling unpredictable ambient vibrations are an issue, and satisfying the minimum electrical energy required are only a few of the problems. In order to generate usable electrical energy for powering Microsystems, it is important to optimize the performance [3], if an electric field is applied across the sensor, one plate will expand and the other will contract. As a result, stress develops in both plates, causing bending deformation throughout the structure. Also, if the applied force or a pressure to the cantilever's tip, the upper plate develops compressive strain while the bottom plate develops costly strain. Therefore, negative charge develops on the upper plate and a positive charge develops on the bottom plate. due to their capacity to generate a wide range of sensors, cantilever sensors have steadily gained favour in many scientific applications in modern years [4]. Electrical energy can be generated from ambient mechanical vibration, Wireless sensor networks, chemical sensors, and health monitoring are all examples of applications where vibration energy is utilized effectively and converted into electrical energy. Three electromechanical transduction techniques are used to convert energy piezoelectric, electrostatic, and electromagnetic, because of the ease of design and increased conversion efficiency, piezoelectric sensors have influenced a lot of

[1,2,3,4]Department of Electronics & Communication Engineering, Alva's Institute of Engineering & Technology. Moodbidri, Dakshina Kannada. dvmanjunatha@gmail.com, veeraprathap2001@gmail.com, bkshree13@gmail.com, anshaprathiba@gmail.com

A Review: Smart Portable Wind Turbine

Ansha Pratibha[1], Abhishek C[2], Arun V. Devaji[3], Nilesh Awati[4] and Dhanush B A[5]

Assistant Professor, ECE, AIET, Mangalore, India

[2345]UG Scholar, Dept of ECE, AIET, Mangalore, India

Abstract— This review study examines the potential new technology of portable wind turbines, which provide an off-grid or remote location's clean and renewable energy production alternative. The study gives a general review of the design tenets, functional features, and performance indicators of various portable wind turbine types, including vertical axis and horizontal axis designs. Also, the report assesses the benefits and drawbacks of using portable wind turbines for military operations, disaster relief, boating, camping, and other activities. The article also covers prospects and obstacles in the design and marketing of portable wind turbines, including the requirement for affordable and dependable energy storage options. Overall, this review article provides a thorough analysis of the state of portable wind turbines today and their future applications as a renewable energy source.

Keywords:-Portable, clean and renewable, affordable energy storage;

I. INTRODUCTION

One of the cutting-edge technologies that have arisen in response to the growing demand for clean, renewable energy sources is portable wind turbines. These turbines are designed to produce electricity in remote or off-grid places where traditional power sources are not readily available or practical. Portable wind turbines offer a flexible and reliable energy source for a range of activities, such as camping, sailing, disaster assistance, and military tasks.

Portable wind turbines are designed differently from normal wind turbines and have different operational characteristics since they need to be light, small, and easy to transport. Recent advances in materials science, aerodynamics, and control systems have allowed for the construction of incredibly powerful and durable portable wind turbines that can function in adverse weather conditions.

Notwithstanding the potential benefits of portable wind turbines, one problem still needs to be solved: the requirement for energy storage systems to ensure a constant supply of electricity. Also, more research and development is needed to boost the productivity and decrease the cost of portable wind turbines.

In-depth analysis of the current state and possible uses of portable wind turbines as a renewable energy source is provided in this research study. In the article, various types of portable wind turbines' design concepts, operating characteristics, and performance metrics are discussed along with an evaluation of their benefits and drawbacks in various applications.

II. LITERATURE SURVEY

Ravi Anant Kishore al [1] has proposed about the design andcharacterization Describes a portable small-scale wind energy turbine (SWEPT) intended for use in winds under 5 m/s. During extensive wind tunnel testing, We looked into SWEPT's aerodynamic performance parameters. It was discovered that at a tip speed ratio of 2.9, the performance coefficient reached its maximum value of 14%. At the 5 m/s rated wind speed, SWEPT produced 0.83 W of electricity with a relatively low cut-in wind speed of 2.7 m/s. Moreover, Computational Fluid Dynamics (CFD) simulations were used to create a diffuser structure for SWEPT. It was discovered that SWEPTs can generate 1.4–1.6 times more electricity using diffusers that are around the same length as their diameter. It is also discussed a different approach to calculating mechanical power that does not call for a torque measurement device and is therefore particularly useful for common laboratory experiments.

Rutivarman Subramaniam et al [2] has developed The global society is becoming more conscious of the value using energy from renewable sources including solar, wind, and geothermal as a primary replacement for fossil fuels. In order to provide electricity to its citizens, many nations, like the United Kingdom, Spain, the United States, and The development of renewable technology, especially wind energy, has begun in Japan. Due to the East Coast region's typical wind speed of 3-6 m/s and its inefficiency for large-scale power production, wind energy is not regularly utilised in Malaysia for power generating. Nonetheless, a tiny windmill may generate power from light winds. Also, remote places where there isn't enough electricity to run a small device can use the mobile wind turbine. This project aims to develop and construct a movable vertical wind turbine for small-scale energy production. The design research starts with an analysis of the wind speed in Malaysia, the various types of wind turbines, their features, and the popularity of portable wind turbines right now. The best method for building a movable type of wind turbine was chosen, hence a vertical wind turbine was chosen. Also, the Savonius and Darrieus wind turbines' wind blades were chosen.

Ravi Anant Kishore et al [3] has improved the work carried out by the author [1], Compared to large-scale wind turbines (LSWTs), small-scale wind turbines (SSWTs) have received far less research interest, particularly for applications requiring low wind speeds. Theoretical and practical results for a SWEPT with a 40 cm diameter and a rated wind speed of 4.0 m/s are presented in this work The rated power output of SWEPT is 1

A Review: Wireless Surveillance Robot Using GSM And RF Technology

Udaya Kumar[1], Harshyani A R[2], Charan N[3], Aishwarya M T[4] and Dhanaraj R B[5]

[1]Associate Professor, ECE, AIET, Mangalore, India

[2345]Students, Dept of ECE, AIET, Mangalore, India

Abstract- The intellectual and emotional appeal of robots and robotic technology beyond that of any other engineering product, and this appeal is no longer present. therefore, with regards to kids and teens Robots and robotic technologies offer a very effective and adaptable way to illustrate a range of engineering ideas. They are a practical application of physics, science, engineering, and mathematics. In order to reinforce science and engineering theory and to teach basic software and mathematical engineering in grammar school, middle school, and high school, a growing number of educators are turning to robotic technology and robots. We think that robots, particularly security robots, will play a significant role in our daily lives in the future. Robots are operated using RF remote controls, Bluetooth, Wi-Fi, and other technologies in the prior approach. The use of these technologies, however, is restricted to a few domains and is therefore quite challenging to design. The lifespan of the robot is crucial since, in general, they are geographically dispersed, frequently in remote locations. To increase the lifespan of robots, electrical energy and electrical conservation are crucial factors. Robots use more power while the RF transmission is in progress. An ideal communication should be conducted in order to reduce the amount of electricity required. We have developed a mobile operated robot utilising a GSM module to get around the challenges. using a mobile device Robot is a mobile device that, until it loses signal on your phone, can be controlled wirelessly over a large area. The ability to be controlled from anywhere in the world is a broad idea behind mobile controlled robots. In order to spy on people less frequently, this project aims to build a GSM and RF-based surveillance robot with a wireless camera connected. This robot communicates with the base station by sending a signal using a wireless camera. One of the key applications of the research can be investigated using the android-based smart phone that could be used to control the robot's mobility. The signal is sent to the robot's receiver, which is mounted on the robot, by the robot's transmitter at the base station.

I.INTRODUCTION

The primary goal of the project is to design a surveillance robot that can record events using a camera sensor, alert the user via an RF transmitter module, and be controlled by the user by both an RF and GSM module. The robot's obstacles sensor allows it to detect obstructions as well. One more effective tool is the GSM module. If the robot accidentally moves out of the RF signal's range, we can activate the GSM module and call the robot to get it back in range. This device is beneficial and practical for enemy surveillance purposes in defence areas where human access is prohibited. The major objective of this project is to develop an embedded system that controls the car using GSM technology and a wireless camera for spying purposes. From a defined location, the robot can be used to observe and record audio or video. This could be advantageous for both environmental monitoring for security and research purposes. The robot can remotely explore and gather data from hazardous or challenging to reach regions. The robot can instantly relay data or audio/video broadcasts to a remote location using the GSM module. The faster operating speed is the key benefit. One SMS message must be sent for each motion in SMS-based control. Yet in this case, we can execute several moves in a single call. Call-based regulating is more affordable than SMS-based controlling, which is another benefit. Robots that are controlled wirelessly in the traditional sense require RF circuits, which have restricted frequency range, working range, and control. Using a cell phone can help you get beyond these obstacles. It offers the benefits of strong

A Review: IOT Based Real Time Monitoring and Control System for Mushroom Farm

Sudhakara H.M[1], Shashank S Kashyap[2], Pratheek Kumar[3], Suma[4], Sathvi[5]

[1]Associate professor, ECE, AIET, Mangalore, India
[2]UG Scholar, ECE, AIET, Mangalore, India
[3]UG Scholar, ECE, AIET, Mangalore, India
[4]UG Scholar, ECE, AIET, Mangalore, India
[5]UG Scholar, ECE, AIET, Mangalore, India

---***---

Abstract - In recent years, technology in agriculture has grown and some of them have used information technology based on Internet of Things (IoT). The general objective is to combine the cultivation and agriculture using IOT technology. This study is based on cultivation of milky mushrooms with help of automated technology as they have good selling values and require special conditions, namely a humid environment at a temperature range of 20-25° C and also relative humidity level between 85 and 90%. The use of IoT systems in mushroom farms is common for providing effective agricultural solutions. The Arduino used to control the signals based on temperature and humidity and also a GSM module to send the real-time data to an app over the internet. The employment of sensors in a variety of agricultural industries has a significant positive impact on crops and aids in lowering and raising operating costs.

Key Words: Arduino, Temperature, Humidity, GSM module.

1.INTRODUCTION

The milky mushroom (Calocybe indica) is now India's third most widely used commercial fungus. The attractive, sturdy, white sporocarps, extended shelf life, sustainable yield, delectable flavor, distinctive texture, and cholesterol-free foods have all contributed to the mushroom's rapid rise in popularity. They also have essential medical benefits, such as an antiviral impact. Mushrooms are a very good source of protein, vitamins, and minerals. They also have enticing flavors and are devoid of cholesterol. They also have a number of significant therapeutic benefits, including an antiviral effect. Furthermore, a great source of thiamine, riboflavin, nicotinic acid, pyridoxine, biotin, and ascorbic acid are milky mushrooms [1]. Agriculture is one area that needs to be enhanced for the production of food, particularly the growing of oysters and milky mushrooms. Because they are minimal in calories, carbs, fat, and sodium, mushrooms are a popular and valuable food. They include vital minerals and don't contain cholesterol. Lack of temperature and humidity management causes farmers who grow mushrooms to frequently fail, which leads to subpar mushroom yield. By regulating the atmosphere's temperature and humidity, one can increase the production and quality of mushrooms. Regulating these factors and upholding a controlled environment is extremely difficult, yet doing so enables growers to produce good crops and turn mushroom cultivation into a lucrative industry. The use of sensors in a range of agricultural sectors has a good effect on crops and helps to both reduce and increase operating costs. Being heterotrophic organisms, mushrooms are frequently employed in a range of processed foods, medications, and other products. Fungi, a different class of creatures, including mushrooms. They rely on dead and decomposing organic things to develop because they lack the chlorophyll that plants have. They obtain their sustenance from these decomposing substrates with the aid of very small, thread-like structures (mycelium), which penetrate the substrate but are typically not visible on the surface. In India, Milky mushrooms are produced seasonally and in climate-

A Review: Sign Language Converter Using Hand Gloves

Veeraprathap V[1], Shashank [2], Shashank Shetty [3], Swajan Kumar [4], Vinay S[5]

[1]Sr.Associate Professor, ECE, AIET, Mangalore, India

[2345]UG Scholar, Dept of ECE, AIET, Mangalore, India

***

Abstract - Most people in the world are not able to communicate with other people because of different levels of disabilities caused by work accidents or some diseases. They are facing a lot of problems while communicating. They use sign language to communicate with normal people. But there is a communication barrier between normal and mute people while communicating. Therefore, the paper proposes a smart glove to convert sign language into voice. This system consists of a flex sensor, accelerometer and touch sensor attached to the gloves. These are used to sense the different gestures made by the mute people and couple the analogy voltage to the Arduino. After that, it is converted into speech using the speaker. So, this system helps mute people to communicate with normal people.

Key Words: Flex sensor, Bluetooth, Accelerometer

1. INTRODUCTION

Sign languages are the natural languages that are structurally different from the verbal language spoken on a day-to-day basis. Using hand movements, facial expressions, body posture and other movements is a form of communication. This form of communication is mainly used by hearing-impaired and mute people. It has an important role for people with speech disorders.

A speech-impaired person finds it challenging to comprehend normal people and vice versa when they try to communicate. To overcome the gap between people with hearing impairments and speech challenges, gesture recognition systems are being used. The study of gesture recognition is quite active. Sign language is not considered a global language and varies from country to country.

Sign language detection has been the subject of many research works, for example, American Sign Language (ASL) in the US, British Sign Language (BSL) in the UK and Japanese Sign Language (JSL) in Japan. There are around 137 sign languages are used around the world, with several nations having more than one native sign language, according to the 2013 edition of Ethnologue. The majority of nations utilize American Sign Language. In India, we are using Indian Sign Language.

2. LITERATURE SURVEY

Veeraprathap et al [1] have developed medical sensor networks to assist people with disabilities. Their system includes a glove-based sign-to-voice converter for American Sign Language, which synthesizes and adapts speech signals for English and various Indian languages. Additionally, they propose a sensor-controlled wheelchair that can navigate, detect obstacles and move automatically using Gesture and Ultrasonic Sensors to create Ad-hoc sensor networks. This technology can improve mobility assistance for people with physical impairments or elderly individuals.

Nikhita et al [2] have developed a smart glove for interpreting sign language, which can recognize the ten letters of the English alphabet. The glove uses LED-LDR pairs on each finger to detect hand gestures, which are then converted into digital signals by a microcontroller. These signals are transmitted wirelessly over ZigBee and translated into ASCII characters for each letter. When a message is received, a computer plays the corresponding audio and displays the letter on the screen. This innovative system has potential

Siddesh

Railway Track Crack Detection System using Arduino

Guru Prasad B[1], Megha R[2], Nikhil C R[3], Sanju Shree V[4], Shantveer Patil[5]

[1]Senior Assistant Professor, Department of Electronics and Communication Engineering

[2,3,4,5] Students of Electronics and Communication Engineering

Alva's Institute of Engineering And Technology, Mangalore Dakshina Kannada

---***---

Abstract - The goal of the railway track crack detection using Arduino project is to find any fractures in the tracks so that both people and cargo may travel safely. The project processes the data from different sensors put on the railroad lines using an Arduino microcontroller. Accelerometers and strain gauges are the sensors utilised in the project and are positioned at various points along the tracks. These sensors pick up on any trembling or distortion in the rails brought on by cracks, which can be a sign of possible dangers early on. The Arduino microcontroller then analyses the information gathered by the sensors to find any track cracks. The device will contact the relevant authorities or the train operator if a crack is found, alerting them to the possible threat. The alert may appear as an alarm or as a message on a screen. The railway track crack detection system utilising Arduino is cost-effective and straightforward to implement, making it a viable solution for railways worldwide. It can assist reduce the likelihood of accidents caused by track failure, assuring the safety of passengers, crew, and freight.

Key Words: Arduino, Ultrasonic sensor, IR sensor, DC Motor

1.INTRODUCTION

One of the most significant transportation networks in the world, the railway system is crucial to the economies of many nations. It is crucial to ensure the safety of both passengers and cargo, and one important aspect of preserving safety is the state of the railway tracks. Wear and strain, bad weather, and large loads are just a few causes that lead to cracked railroad rails. These fractures have the potential to lead to accidents and derailments that result in considerable loss of life and property. Hence, regular track maintenance and inspection are required to guarantee their safety.

In this situation, the railway track crack detection using Arduino project seeks to offer a solution that may identify track cracks early on, enabling authorities to take the necessary precautions to avoid accidents. The project gathers information from the railway rails and processes it using a variety of sensors and an Arduino microcontroller. This project offers a simple, low-cost method of monitoring the condition of the railroad tracks that is also effective and reliable. The safety of passengers, staff, and freight can be ensured by adopting this technology to lessen the possibility of accidents brought on by track breakdown.

2. LITERATURE SURVEY

Karthick et al. [1] People use a variety of modes of transportation in this world to get from one location to another. They prioritise using public transportation the most for safer travel. The transportation departments inspect the safety measures put in place at the same time.

Siddesh
H. O. D.
Dept Of Electronics & Communication
Alva' Institute of Engg. & Technology
Mijar MOODBIDRI - 574 225

26

PALLIATIVE CHAIR

Nikhil S[1], Kruthik B S[1], Sumanth K S[1], Sanjay C[1], Dr. Dattathreya[2], Dr. Peter Fernandes[3]

[1] Student, ECE, Alva's Institute of Engineering & Technology, Mijar, INDIA

[2] Sr. Prof. & Dean Planning, ECE, Alva's Institute of Engineering & Technology, Mijar, INDIA

[3] Principal, Alva's Institute of Engineering & Technology, Mijar, INDIA

ABSTRACT

In different sectors of industry, sedentary employment frequently results in physical discomfort and pain, which lowers productivity. With the purpose of reducing pain and enhancing wellbeing, a modified palliative chair is suggested. The chair offers support for the lower back, neck, and shoulders and incorporates on demand massage and heat treatment elements. The research on the health advantages of massage and heat therapy is discussed, emphasizing their potential to lessen the adverse consequences of extended sitting. The adopted design may increase productivity and well-being, which would be advantageous to both employers and employees. To completely comprehend the effectiveness and user satisfaction of this technology, more research is required. Employees can improve their physical well-being while at work with the help of this updated ergonomic chair design.

KEYWORDS: Sedentary employment, Ergonomic chair design, Massage therapy, Heat treatment, Productivity, Workplace well-being.

INTRODUCTION

Sitting for extended periods of time is becoming common in fields such as information technology, higher education, and management positions. This can result in physical discomfort and suffering, which in turn lowers productivity. While designed to support and comfort workers during long shifts, ergonomic chairs may not always be able to fully alleviate the pain and discomfort brought on by prolonged sitting. In response, we suggest a modified palliative chair with features for on demand heat therapy and massage to reduce pain and enhance physical well-being.

This review paper examines how the suggested modified palliative chair design can help sedentary workers. We will go over the research on the health advantages of massage and heat therapy, emphasising how they might lessen the impacts of prolonged sitting. We will also look at the difficulties and restrictions that come with using this technology, such as the price, technical needs, and user preferences.

This redesigned ergonomic chair design has the potential to increase productivity and well-being, benefiting both individuals and employers, by offering an affordable option for professionals to improve their physical well-being while at work. Other fields that necessitate extended sitting, such call centers and financial institutions, may benefit from the proposed design. To completely comprehend the effectiveness and user satisfaction of this technology, more research is required.

LITERATURE SURVEY

In their study, Mohanty et al [1] provide a comprehensive approach that combines statistics and artificial intelligence to create industrial or office workspaces that consider the physical and psychological needs of employees, resulting in greater effectiveness and production. They use measurements from the Bureau of Indian Standards to conduct a case study on office chair design to evaluate their methodology. The authors discover that creating items with the best criteria can increase customer attractiveness while minimizing user weariness and damage. Workplace settings can be created to encourage productivity and well-being by considering the physical and psychological demands of employees.

According to Samad [2], ergonomics is becoming increasingly crucial in boosting efficiency, safety, and comfort in industrial production as technology progresses. Ergonomics seeks to optimize the interaction between people, tools, and the workplace, which includes designing tools and equipment to match the worker's demands and tailoring the environment to the worker's requirements. Backaches, neck pain, and muscle strains caused by inadequate seating and posture are major concerns in ergonomics. This can be addressed by creating pleasant and user-friendly workplaces, giving workers with ideal surroundings, lowering physical workload, and optimizing working postures.

Chandra et al [3], highlights how the advancement of information technology has resulted in the establishment of "office ergonomics," which entails creating desks, workplaces, and workstations that may be utilised by different persons at different times. This includes examining corporate operations and creating workstations with furniture, equipment, computer systems, and environmental

aspects in mind. Overexertion and repetitive strain injuries at work underscore the need for a better understanding of workplace ergonomics and workstation design, especially in flexible office employment. The paper includes an in-depth examination of these problems, as well as the development of flexible office design to reduce negative consequences and boost good ones, while also emphasising worker health and safety and analyzing the critical ergonomic challenges in office work.

The COVID-19 epidemic has raised demand for ergonomic computer workstation chairs, as more individuals work from home using computers. According to Math et al [4], the global market for these chairs is predicted to reach $ 29.67 billion. In response to this desire, the authors created an ergonomic office chair for laptop users using Indian anthropometric data and Solid Works, with the purpose of decreasing muscular tension and increasing productivity. A CAD model of the workstation's parts was created using design inputs derived from common human traits. This project focuses on laptop users, who have fewer ergonomic design requirements than desktop users.

Xu et al [5] emphasize the relevance of employing ergonomic principles to analyze human sitting position and dynamic behaviour in current office work. To produce new design concepts for office chairs that are pleasant, productive, and safe for human health, extensive research is required. Modern office chairs should be constructed with the body's posture in mind to reduce negative health impacts while also promoting comfort and productivity. The authors recommend that while designing ergonomic workplace chairs, numerous elements be considered, including human posture and interactions between people and seats. The authors illustrate how to develop safe and comfortable workplace chairs by using design examples that combine ergonomics concepts. By taking these factors into consideration, ergonomic office chairs can increase workplace efficiency while decreasing the risk of musculoskeletal issues.

Employees must sit in a supported and comfortable position in office chairs because many modern western jobs require them. A study was done by Roland Zemp et al [6] to evaluate the precision of objective methods for calculating sitting comfort. They discovered a relationship between users' perceived levels of comfort or discomfort and office chair pressure measures, suggesting that pressure readings may provide some insight into how comfortable users are. To completely comprehend the connection between objective metrics and unique sitting comfort experiences, more investigation is necessary. The study stresses how important it is to evaluate office chair ergonomics and design from both an objective and subjective standpoint.

In their overview of international ergonomics regulations and recommendations for designing computer workstations, E.H.C. Woo et al [7] note the variations and their effects on health issues. To address the accelerating development of computer technology and its effects on computer users' health and wellbeing, they offer arguments and suggestions for modifications to the current standards and guidelines. The best practises for input devices, visual displays, lighting, environmental factors, and furniture arrangement and design are suggested in the article. The authors stress the significance of upholding current ergonomics norms and recommendations in order to reduce the risk of health problems

Siddesh
H. O. D.
Dept Of Electronics & Communication
Alva' Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

27

Fertilizer Quality Testing Machine Using NPK

Guruprasad B[1], Vybhav Gowda M[2], Rahul S[3], Niveditha A[4], Shwetha H M[5]

[1]Assistant Professor, ECE, AIET, Mangalore, India

[2345]UG Scholar, Dept of ECE, AIET, Mangalore, India

---***---

Abstract - This abstract outlines a new machine for testing fertilizer quality that utilizes NPK analysis to measure nutrient levels in different types of fertilizers, including granular, powdered, and liquid forms. The device uses chemical reagents and optical sensors to measure the amounts of N,P, and K in the fertiliser samples and calculate those levels. The system produces quick, automated results that are simple to read and can be exported for more research. This technology is expected to improve the quality control of fertilizers, ensuring that farmers can access high-quality fertilizers that meet their specific nutrient requirements.

Key Words: NPK Sensors, IR-Spectroscopy.

1.INTRODUCTION

Farming is often seen as a less technologically advanced industry, and farmers often rely on physical labor to maintain their crops. However, many agricultural procedures, such as fertilization, are not always necessary, and farmers often lack clear guidance on whether or not to apply them. As a result, farmers may over-fertilize their crops, leading to economic and environmental consequences. In actuality, the creation and application of nitrogen fertilisers is responsible for up to 80% of agricultural greenhouse gas emissions, including nitrous oxide. Traditional manual soil testing are not always accurate, which might result in fertilisation that is either too much or too little.

Teralytic's sensor is a device that addresses this issue by providing real-time information about soil composition. The sensor is a meter-long, battery-powered device with 26 different sensors that detects NPK levels, pH levels, soil moisture, temperature, aeration, and temperature and humidity above ground. Farmers may be able to adopt more environmentally friendly fertilisation techniques with the use of this knowledge, thereby increasing crop yields as well. By incorporating accessible technology like the Teralytic sensor into agriculture, food production can become more efficient and cost-effective, while also reducing pollution and environmental impact.

2. LITERATURE SURVEY

Potdar *et al.* [1] and colleagues (2021) suggest that to sustainably meet the food requirements of a growing population, it is essential to have high-yield plantations that receive adequate amounts of essential nutrients such as N, P and K through well-nourished soil. Soil nutrient analysis can be conducted through both physical (optical) and chemical (electrochemical) methods. Optical methods are ideal for developing portable sensors because they can detect nutrients in dry soil samples without the requirement for time-consuming pretreatments. Inexpensive colorimetric methods are particularly useful for developing portable optical sensors for the detection of soil macronutrients since they don't require expensive equipment or sophisticated analysis techniques.

Aitkenhead et al. [2] and colleagues (2011) emphasize the significance of monitoring soil and crop conditions for sustainable agricultural management. However, the conventional methods of collecting samples and sending them for analysis can be time-consuming and not practical for quick decision-making. To address this issue, The James Hutton Institute's low-cost hyperspectral technology can swiftly assess the condition of the soil and plants in a field. The tool was tested out at the Institute's research farm in Balruddery, where spectral

---

28

Study on ZnO and BaTiO3 for Low Frequency Applications

Sushanth Anil Lobo[1], Ragate Poojabai[2], Shilpa R[3], Soupoorna S Moger[4], Srushti Myageri[5]

[1]Assistant Professor, ECE, AIET, Mangalore, India
[2,3,4,5]UG Scholar, Dept of ECE, AIET, Mangalore, India

Abstract:

In this paper, we have discussed about piezo electric materials and its properties which are suitable for design and fabrication of low frequency applications. In this we have multiple of piezoelectric materials for the design of low frequency cantilever beam among them some of are here like, ceramic, lead zirconate titanate, composite material, barium titanate, quartz, pvdf, lithium niobate, lithium tantalate, zinc oxide, piezoelectric ceramics, among this here we compared two piezo electric materials they are P(VDF-TrFE) and copolymer such as ZnO and BaTiO3. This process has been done through polarization and annealing. Initially the process the process starts by simulation which includes calculation of polarization frequency of a compared elements, further the characterization of an BaTiO3 and ZnO will be done by oscilloscope and the fabrication of this materials will done through electrospinning.

Keywords: Piezoelectrical co-polymer P(VDF-TrFE), Cantilever beam, Piezoelectric material, BaTiO3, ZnO, Electrospinning.

INTRODUCTION

Piezoelectric materials are the materials that may produce electric energy upon application of mechanical stress. A generally known piezoelectric substance is quartz. The method involves the creation of an electric charge as a result of the electron's mobility in response to stress.

There are six different types of piezoelectric materials, including single crystalline minerals like quartz, piezoceramics like lead zirconate titanate (PZTs), piezoelectric semiconductors like ZnO, polymers like polyvinylidene fluoride (PVDF), piezoelectric composites, and glass ceramics. Moreover, PZT fibres can be combined with resin to create PZT or macro fibre composites. The mechanical and piezoelectric properties vary among these distinct piezoelectric materials. Due to the great efficiency of power generation, PZT material has been used in numerous commercial goods.

Zinc oxide crystallises hexagonal wurtzite and cubic zinc blende in two major forms. Wurtzite's structure is most stable and prevalent in ambient conditions. On substrates with a cubic lattice structure, adding ZnO can stabilise the zincblende form. These materials can be used in manufacturing rubber, ceramic industry. BaTiO3 (BT) was the first polycrystalline ceramic material ever identified that demonstrated ferroelectricity. As we discussed above, ZnO and BaTiO3 can be used in low frequency applications such as energy harvesting, cantilever beams, acoustic applications and so on.

Siddesh

A Review: Intelligent Mobility Solution

Bhagyashree [1], Rashmi K[2], Spoorthi A M[3], Thrishala M[4] and Deepa Bevinakatti[5]

Assistant Professor, Dept of ECE, AIET, Mangalore, India

[2345]UG Scholar, Dept of ECE, AIET, Mangalore, India

Abstract -- For individuals, their families, and nations overall, road traffic accidents result in significant economic losses. These catastrophes result from treatment costs as well as lost productivity for those murdered or incapacitated by their injuries, as well as their families. A system that can send an SMS alert to the vehicle owner or loved ones as soon as any symptoms of an accident or that may cause an accident are recognised has been devised since road traffic accidents cost nations 3% of their GDP. In addition, the system archives all readings that occurred prior to and during the accident so that investigators can investigate the specific causes of the disaster in order to avoid similar incidents in the future. A GPS tracking system is created for unintentional monitoring. As soon as the driver starts the engine, the system starts recording the events of the corresponding car using a black box recorder. Together with GPS, a GSM system is used to send SMS alerts to the family, ambulance, and police. Arduino and a number of sensors are used to do this.

Keywords:-GPS technology, GSM, Car black box, Arduino;

I. INTRODUCTION

Currently, road traffic accidents claim the lives of almost 1.3 million people. There are an additional 20 to 50 million people who suffer non-fatal injuries, many of whom go on to develop disabilities as a result of their physical condition. An increase in the number of automobile accidents is being attributed to drivers' reckless behavior, such as driving while intoxicated or fatigued, etc. Given that, according to investigations, more people die in auto accidents than in airline crashes, a black box for a car is built with logical features. Recording the condition of the car before, during, and after the collision is crucial for a thorough inquiry. Research was done to determine the primary data required for improved accident analysis and characteristics to be taken into consideration in order to determine what kind of sensors should be fitted into the vehicle. The place of the collision, the speed being measured, the condition of the car's brakes, and its engine are the key factors taken into account. Black boxes are a grouping of numerous distinct recording technologies. An "event data recorder" is a car black box. The system makes use of a number of sensors, including GPS and GSM technology, vibration, alcohol, temperature, and gyroscope sensors.

II. LITERATURE SURVEY

Antonio et al. [1], this research uses a Raspberry Pi microprocessor and an Internet of Things module to build and construct a car's black box system. This system was created using the Raspberry Pi microcontroller in conjunction with a number of sensors, such as a GPS, camera, audio, and alcohol sensor module, as well as signals from the electronic control unit. Data storage on a secure digital card and in the cloud were both accomplished using the Wave share SIM7600G-H 4G module. The findings indicate that this embedded system is capable of gathering and analyzing information about GPS, alcohol concentration, speed, temperature, and other characteristics. In order to process the stored files, a graphical user interface was eventually created. Similar to an airplane's black box, which employs a particular algorithm to capture every flying detail, this system records all relevant flight data. As a result, when necessary, authorities can retrieve the recorded flight data.

Sangala et al [2] proposed a vehicle-installable prototype of an Automobile Black Box System. This prototype's minimal circuit design makes it possible to build safer automobiles, treat accident victims better, assist insurance companies in their vehicle collision investigations, and improve road conditions, all of which help lower the death rate. Additionally, it concentrates on keeping track of how you're driving in real time and records and retains the information you're tracking in case there's an accident. Every sensor detail is calculated and kept in memory after the accident has occurred.

Kiranmayee et al. [3], the purpose of this wireless black box project is to develop a vehicle black box system that can be installed in any car anywhere in the globe. A wireless black box is simply a device that

Siddesh

H.O.D.

Dept. Of Electronics & Communication

Alva's Institute of Engg. & Technology

Mijar, MOODBIDRI - 574 225

30