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Title : Home automation using raspberry pi controlled via an android application Name of Journal: International Journal of Current Engineering and Technology

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Title : Interior Design using Augmented Reality Environment

Name of Journal: International Journal of Innovative Research in Science ,Engineering and Technology



## 3.Author's Name : Dr. Rizwana S

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#### 5.Author'sName : Preeti Hemnani

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## 6.Author's Name : Dr.K.Lakshmisudha

Title : Review analysis of the routing protocols in wireless sensor networks for energy optimization Name of Journal: Indian Journal of Computer Science and Engineering (IJCSE)



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Title : Smart Precision based Agriculture using Sensors

Name of Journal: International Journal of Research and Analytical Reviews (IJRAR)



8.Author's Name : Ms. Seema Redekar

Title : A Survey on Eat-Out Recommender in Hadoop

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12.Author's Name : Ms. Saritha LR

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13. Author's Name : Mrunal Khadase

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Title: Classification of Low Resolution Satellite Images Using Image Fusion and Decorrelation Stretch Name of Journal : International Journal for Research in Engineering Application & Management



15. Author's Name : Dr. Pradip P. Patil

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17. Author's Name : Lokpriya Gaikwad

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Name of Journal : Int. J. Six sigma & Competitive advantage, (Inderscience),

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18. Author's Name : Chavan Ashwinkumar Raosaheb

Title : On Fixed Point Theorem In Weak Contraction Principle

Name of Journal : International Journal of Advanced Research

# **UGC Journal Details**

Name of the Journal :	International Journal of Advance Research
ISSN Number :	
e-ISSN Number :	23205407
Source:	UNIV
Subject:	Ecology;Environmental Science(all);Nature and Landscape Conservation
Publisher:	http://www.journalijar.com/
Country of Publication:	India
Broad Subject Category:	Science

19. Author's Name : Chavan Ashwinkumar Raosaheb

Title : On Picard's Existence and Uniqueness Theorem

Name of Journal International Journal of Applied and Pure Science and Agriculture

# **UGC Journal Details**

International journal of applied and pure science and agriculture
2394823x
23945532
UNIV
Chemistry(all)
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20 Author's Name : Dr.Ramkishan Bhise

Title : Rationality vs sentimentality in Jayant Narlikar'sganpati idol with right trunk

Name of Journal: Asian Quarterly - An International journal of contemporary Issues



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ASSAN QUARTERLY: An International Journal of Contemporary Insus / May 2016 & Aug 2016

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#### ISSN NO: 1076-5131

# Intelligent Hiring with Facial Expression Detection and Report Generation

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Abstract-Natural Language Processing and Machine Learning has helped improve the performance of computers to a level that they are able to tackle complicated problems better than the humans can. Education is an important core of our current societal structure. However, students can't add value to the society without a job that aligns with their aspirations in life and enables for the self sustenance of their familial units. One of the problems faced by students in colleges, who are just about to complete their graduation, is the placement activities. Hiring organizations conduct a variety of tiered sieving processes for attributes in students that align with their organizational directives. One of the most important activities in placement is the Interview. Students in college appear for their first ever interview as a bundle of nerves, most of them never having handled the pressure in such a scenario. This is one place where Natural Language Processing and Machine Learning comes to play. The Placement Assist is a virtual system where the feel of an Interview can be simulated. The Placement Assist is a software that will help college students crack the campus interviews. The system will analyze all parts of the interview right from the resume to the interview with the help of machine learning and natural language processing. The user can appear for mock interview without any scheduling and have the results in report that will not identify their flaws but also recommend only improvements.

Index Terms—Machine Learning, Facial Expression Detection, Video Interview,Convolutional Neural Network.

#### INTRODUCTION

L

Facial Expression has been a source of non -verbal communication as long as man has existed on this planet and is present in some way for a majority of the mammals and some of the animal species. Facial expressions can be either voluntary or involuntary and the neural mechanism that is responsible for controlling these expressions differ in each case.

Facial recognition is often an emotional experience for the brain and the amygdala, located at the center of the brain, is highly involved in the recognition process. Certain aspects of facial expression such as blinking rate can possibly be used to indicate whether a person is lying or if the person is nervous. They also play an important role in interpersonal communication and sign language.

Facial expression recognition has been a topic of interest and study in the field of Human-Computer Interaction and a lot of progress has been made in this field that nowadays it is used in

Volume VI, Issue V, May/2019

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### A Smart and Prognostic approach to park vehicles using IoT

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Abstract—Tremendous increase in the number and usage of four wheeler vehicles have led to a lot of problems in parking. Due to this problem people have started parking the vehicles on roadside which has increased traffic a lot. This has also contributed to a lot of congestion on the roads. To avoid this, we have designed a prototype which senses whether a parking slot is empty or full and accordingly enters into the parking lot. We have designed an app which can be installed on mobile phones and hence help the person to locate the parking lot. This will hence, automatize the system of parking and also help to reduce the problem of congestion.

Keywords-Sensors, Raspberry Pi, IoT, Android App

#### I. INTRODUCTION

Traffic is an alarming problem on a global scale. Day by day the numbers of vehicles and their usage is increasing

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## JASC: Journal of Applied Science and Computations

ISSN NO: 1076-5131

# THE NEXTGEN BOT

Kalpalathika Ramanujam<sup>1</sup>, Kumaran Parameshwaran<sup>2</sup>,Saravana Pandian<sup>3</sup>, Karthik Konar<sup>4</sup>, Prof. Kalyani Pampattiwar<sup>5</sup>, Preeti Hemnani<sup>6</sup>

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Abstract —UN-manned 360 (photo or video) capture and control of the bot from any given location. The backbone and the pith idea of this project is to replace human intervention by bot during rescue operations carried out because of natural calamities like floods, fire breakouts or even during a terrorist attack. The concept is that the bot will initate the actions of the human being, both of them will be in two different locations and the bot would be controlled remotely in the place of rescue operations. This bot works as a surveillance bot that will reach out to people who are in need of help thereby reaching areas where human intervention cannot be possible.

Keywords - Internet, Bot ,Human intervention

#### I. INTRODUCTION

The main aim of this project is that the bot will imitate human motion in the situation where human intervention is impossible or maybe lethal. Unmanned control of the bot from any remote location is what we are aiming to achieve. Although human figures can be present at certain places during emergency but it is not possible to be available everywhere and enter all places. So the idea of a bot is being implemented wherein this bot can act as a surveillance bot as well as a bot that can emulate human actions and achieve the given goal in any situation. Using IoT and Node MCU, it is possible to make a bot imitate the actions of the human controlling the bot. The human controlling the bot will be able to view the scenario that is displayed in front of the bot and will perform the necessary actions that is conducive to the given situation which will in turn act as an input to the bot so as the bot can imitate the given actions.

A. Motivation

The motivation of the project is that many lives are being sacrificed in the course to save others during a natural calamity, terrorist attacks, fire breakouts etc. The significance is that the human intervention is not needed which will ensure saving a life and if the bot is made to imitate human action which is in control of the person who is trained to do the same during such emergency situation, automatically saves the other life too. But the only difference will be, instead of that person physically being present at the scenario, the bot will be present for the rescue or to imitate any action or operation required at that moment. The application is not limited for just rescue operations but many more which is discussed in later part of this report.

B. Scope of the project:-

The bot will be travelling through the places as desired by the controller and imitate his action. This will help to deliver anything as a first aid. The gesture of the controller will be imitated by the robotic arm and the robotic vision can be viewed in Virtual Reality headset worn by the controller.

Volume VI, Issue IV, April/2019

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© 2019 URAR May 2019, Volume 6, Issue 2 www.ijrar.org (E-ISSN 2348-1269, P- ISSN 2349-5138) Performance Evaluation of Blood Sample Analysis using GPU

> <sup>1</sup>Preeti Godabole, <sup>2</sup>UjwalaRavale Assistant Professor, Assistant Professor Dept. of Computer Engineering, SIES Graduate School of Technology, Navi Mumb

Abstract: The need for novel healthcare solutions and continuous efforts in understating the biological bases of pathologies has resulted in extensive research in biological sciences. Numerous practical problems arise where data size is huge as it contains large number of images and text data. This data has to be classified using neural network and other similar constructs. Deep learning has gained importance due to the potential it obtained for machine learning. The objective of the current work is to use a deep learning approach to baild a system for acute leakernin classification. It proves a powerful complementary clinical term assessing patient's disease severity. An automatic detection and classification system for detection of acute leakenia from peripheral blood images is implemented using the mecosing more of GPU1. implemented us ng the processing power of GPU.

Index Terms - Convolution Neural Network, Deep Learning, Image Analysis, Leukemia.

#### I. INTRODUCTION

Deep learning can be defined as the use of deep networks that are linked to calculate algorithms that in turn use several layers to produce an output. In essence, the layers cascade with the next tier using the results from the previous phase as input in order for it to produce an output. Busically, Deep Learning involves feeding a computer system a lot of data, which it can use to make decisions about other data. This data is fed through neural networks. These networks is nothing but logical constructions which ask a series of questions, or extract a numerical value, of every bit of data which pass through them, and classify it according to the answers moment.

In medical industry Computer Aided Diagnosis and detection of blood cell is a rapidly growing dynamic area of research. In this method computers are trained to think by developing intelligence with the help of learning. There are many types of Machine Learning Techniques and which are used to chaosify the data sets. They are Supervised, Lunapervised Semi-Sagarvised, Reinforcement and Evolutionary Learning, and deep learning algorithms. Supervised Learning there are any types of Machine Learning tractances of the straining set, algorithms respond correctly to all feasible input. Learning the similarities, unsupervised Learning the similarities of the similarities and explosion and regression are the types of Supervised Learning the similarities technique traching to the similarities the tween the input data and based on these similarities, unsupervised Learning technique traching technique trists to find out the similarities between the input data and based on these similarities, unsupervised Learning technique traching technique training technique training tracking technique training tracking technique training tracking the similarities of produced [1]. Stem cells mature and develop into three types of blood cancer that begins from home marrow, where blood cell, the healthy blood cell, development process in hindered by uncontrolled progress of a musual type of blood cell. These abnormal blood cells, prevent blood from fighting off infections or preventing serious bleeding. The visual investigation of peripheties is a visitate to in the methods for the identification of leakerinia. A patient's biological fissue samples gained from pathology lab in terms of reports are always used as the standard for analysis purpose in the diagnosis of many disease. These steps are image acquisition, preprocessing, feature extraction, and classification. Leakerinia is the most blood cell, while be healthy blood provide preventing feature extractions and addito overs age of 65 years. Early and quick detection of leakerinis is im

#### II. LITERATURE REVIEW

Neural networks help us cluster and classify. Clustering and classification layer can be built on top of the data we store and marage. They help to group unlabeled data according to similarities among the example inputs, and they classify data when they have a labeled dataset to train on. Neural networks can also extract features that are fed to other algorithms for clustering and classifications of deep neural networks are components of larger machine-learning applications involving algorithms for reinforcement learning, classification and <u>represent</u>. Based on the characteristics of blood cell resourchers have proposed many algorithms to classify blood cells.A convolution neural network (CNN) is a specific deep learning architecture suitable for image recognition. A CNN has input layer, output layer and multiple hidden layers. Xu M, Papage orgins DP, Abidi SZ, Dao M, Zhao H, Karnindak is proposed framework that can successfully classify sickle shage RBCs by using automated methods and with high accuracy. This method uses CNN for predictions. These, the trained deep CNN exhibits good performance even for a deoxygenated dataset and distinguishes the usbule differences in inside the oxygenated and deoxygenated RBCs.

oxygenated and deoxygenated RBX.x. GAOBO LLANG, HUICHAO HONG, WEIFANG XIE, AND LIXIN ZHENG had introduced the recurrent neural netwo (RNNs).This method combined the CNN and RNN in order to propose the CNN\_RNN framework that can deepen the understand of image content and learn the structured features of images and to begin end to-end training of big data in medical image analysis. aral networks standing

IJRAR19K2339 International Journal of Research and Analytical Reviews (IJRAR)www.irar.org 345



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www.ijrar.org (E-ISSN 2348-1269, P- ISSN 2349-5138)

# REMOTE SENSING TECHNIQUE FOR MONITORING AND REDUCING HARMFUL GAS EMISSIONS FROM VEHICLES.

<sup>1</sup>SUBHED CHAVAN, <sup>2</sup>SAHIL SHETTY, <sup>3</sup>SIDHARTH CHANDRAN, <sup>4</sup>Prof. Ms.ANINDITA KHADE

Computer Department, SIES Graduate School of Technology, Nerul, Navi Mumbai,

#### Maharashtra, 400706, India

Abstract— The main source of atmospheric taint happens due to automobiles. Using empirical scrutiny, ritual mechanized air monitoring system has high rigor, but uneconomical and single datum class make it unfeasible for large-scale furnishing. In order to eject the issues in ritual systems we have introduced Internet of Things (IoT) into the field of environmental barrier. This paper is to introduce vehicle emission monitoring system using Internet of Things (IoT) which is a green thumb for tracking down vehicle causing taint on the city roads and measures multifarious genres of toxic wastes, and its level in air. This paper puts forward a kind of real-time air pollution monitoring system at any time anywhere using Gas Sensor. The measured data is shared to vehicle proprietor via text message, and agencies of national environment. This assay shows that the system runs abiding, an economical and can be controlled tractably, it can smell out the vehicle exhaust in real-time, and can improve the detecting level and accuracy of the exhaust monitoring system. This system provides good outcomes in monitoring the air pollution exclusively in the urban areas.

Keywords: Internet of Things, Wireless Technology, Gas Sensors, OpenCV, Machine Learning.

#### I. INTRODUCTION

Air pollution is one of the serious environmental concerns of the urban Asian cities including India, where majority of the population are exposed to poor air quality. The main source of pollution in cities is due to vehicles. The increase in use of vehicles in cities results in vital increase in the emission load of various toxins into air. In addition human activities also affect the environment directly or indirectly. Common gaseous pollutant include carbon monoxide, hydrocarbons and other harmful gases produced by motor vehicle.

Transportation can be responsible for more than 50 percentage of carbon monoxide in the air. This carbon monoxide can play havoc on



[VOLUME 6 | ISSUE 2 | APRIL - JUNE 2019] http://ijrar.com/ e ISSN 2348 -1269, Print ISSN 2349-5138 Cosmos Impact Factor 4.236

# IOT based Air and Sound Pollution Monitoring System

#### Pradyumna Bapat & Karthikeyan Sengunthar & Krishna Shenvi & Anindita Khade Department of Computer Engineering, SIES Graduate School of Technology Mumbai.India.

Received: February 13, 2019

Accepted: March 28, 2019

**ABSTRACT:** In infrastructure and industrial plants the rapid growth creating environmental issues like pollution (Air, Water, Noise), climate change, malfunctioning and has greatly consequence for the requirement of an, operationally adaptable, efficient, cheap and smart monitoring systems. In this context where combination of many challenges of computer science, wireless communication and electronics; the Smart Sensor Networks are an emerging field of research. In this paper a solution to monitor the air and noise pollution levels in industrial environment or by using wireless embedded computing system a particular area of interest is proposed. The technology like Internet of Things (IoT) is included in the form of solution which is outcome of merged field of computer science and electronics. For monitoring the fluctuation of parameters like noise and air pollution levels from their normal levels in this case the sensing devices are connected to the embedded computing system. For the requirement of continuous monitoring, controlling and behavior analysis this model is adaptable and distributive for any infrastructural environment.





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128. ANALYSIS OF SENTIMENTS OF POLITICAL SYSTEM USING RECOMMENDER SYSTEM IN SOCIAL

Akanksha Mrinali, Sanjeev Kumar Sharma; Oriental Institute of Science and Technology, Bhopal

Prof. Pranita Mahajan, Dr. Sharvari Govilkar; SIESGST, Nerul , PIIT, New Panvel Page No: 917-921

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DOI:16.10089.JASC.2018.V5110.453459.14927 127. ASPECT BASED OPINION MINING OF CODE-MIX TEXT

DOI:16.10089.JASC.2018.V5I10.453459.14928

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1	SIESGST, Nerul , PIIT, New Panvel	
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	Abstract In the past decade, opinion mining has become a popular research topic due to its wide range of applications and many challenging ensure handware. The trait has been reliable are write due to include as write a due to induce a second second a	
	research protects. The topic has been studied in many ficios, including natural tanguage processing, data mining, web mining, and information retrieval. Due to high reach out of social media people express their opinion about products or services on social media	
	which also gives them freedom to write reviews in any language. Studies have shown high usage of code-mix language on social	
- Annual Annua	media. This code-mix script is written using Roman alphabets which makes it difficult from data analytics point of view to get the	
2	insight of the information for various applications such as opinion mining, sentiment analysis. This paper deals with study of aspect	
<u> </u>	based opinion mining of code-mix. When user expresses his/her opinion about a product or a service he/she may not have same	
Management Andreas	opinion for every aspect of it. For example if entity is a cell phone then user's opinion about battery, camera, etc may vary. Hence	
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	Code-mixing is highly observed in social media. People use one or more languages to express themselves on social media. Code-mixing (Intra-sentential embedding of other language phrases) and Code-Switching (Inter- sentences of multiple languages) can be commonly the transmission of the sentences of multiple languages) can be commonly the transmission of the sentences of multiple languages.	
3	observed (Balt, 2014). Till date much work is done on analyzing multilingual text to get insight which can be useful in applications such as opinion mining and sentiment analysis. Retriving information form code mix text is a complex process which includes, cleaning input text by removing noisy tokens such as stop words, Identifying Inangane, normalizing text, part of speech mormalization. Setting and the setting of the setting of the setting input text by removing noisy tokens such as stop words, Identifying Inangane, normalizing text, part of speech	

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## Smart Parking Based On Reservation System Using Raspberry-Pi

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## RESEARCH ARTICLE

OPEN ACCESS

# Smart Parking Based On Reservation System Using Raspberry-Pi

Vaishali Mangrulkar<sup>1</sup>, Mahima Agarwal<sup>2</sup>, Sanjana Kokate<sup>3</sup>, Saumya Kothuri<sup>4</sup> Bhumika Mehta<sup>5</sup>

<sup>1</sup>Assistant Professor,<sup>2345</sup> B.E.Students ,Department of Electronics and Telecommunication, SIES Graduate School of Technology, Nerul,Navi Mumbai, Maharashtra, India Corresponding Author: Vaishali Mangrulkar

#### ABSTRACT

In large malls or even for other outside parking, not getting a parking and getting to know the unavailability of parking area after reaching the place is a problem. Besides, the loss of petrol, diesel or CNG gas and also pollution caused because of it is another problem. The proposed project is a smart parking using reservation system that provides customers easy way of booking a slot time. This technology overcomes the problem of unavailability of parking in commercial areas. This project offers a web-based reservation system where the users can view various parking slot available and select the space. If the parking is available then he/she can book it for specific time slot. The booked area will be marked Red for the specific time slot. Additional feature of QR code is added. Once the slot is booked the customer will receive the QR code which will be scanned at the gate to ensure that the person who has booked the slot is entering. Once the QR code is scanned the barricades will open. This is for the security purpose.

Keywords: Smart Parking, Reservation, QR code, Sensors, Raspberry-pi.

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# Journal of Emerging Technologies and Innovative Research

# UGC Approved Journal no 63975

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# Waste Segregation using Convolutional Neural Network

Pushkar Sathe<sup>1</sup>, Omkar Tawade<sup>2</sup>, Tanmay Kale<sup>3</sup>, Syed Samar Abbas<sup>4</sup>, Diksha Thakur<sup>5</sup> <sup>1</sup>Professor, <sup>2, 3, 4, 5</sup> Student, Dept. of Electronics and Telecommunication, SIES Graduate School of Technology, Nerul, India

Abstract: Looking at the population increase in India, waste generation and segregation is a major issue in the current scenario. Tonnes of mixed waste is dumped without segregating it properly which leads to problem in decomposition. Due to this mixed waste several other problems arise over a period of time. To avoid this, waste segregation at least at the basic level is very much needed. We have implemented a system based on Convolutional Neural Networks. The basic idea is that when the waste is to be dumped in the garbage bin, the system will identify the type of waste and will open the dustbin of that category accordingly. Using this system, it becomes easier the segregate waste at the basic level. We have four categories in which waste will be segregated namely, glass, paper, plastic, metal. Four distinct dustbins along with servo motors will be used for the same. Keywords: Waste Segregation, Convolutional Neural Network, Machine Learning, Classification, Detection.

# I. INTRODUCTION

Segregation of waste is an important issue currently faced by the ever-growing population. For a sustainable society, segregation of waste is a must. Initially, segregation required use of hands for separating waste. This became tedious once the

amount of waste increased as population increased. We had to look for something which could automatically sort the waste. This will be more efficient since the employees or garbage pickers do not sort the waste 100 percent. The fine waste cannot be segregated manually.

Thus, it will not only enhance the surrounding environment but also reduce the pain of segregation manually.

Presently in India, about 960 million tonnes of solid waste is being generated annually. 350 million tonnes are organic wastes, 290 million tonnes are inorganic waste of industrial and mining sectors, 4.5 million tonnes are hazardous in nature.[1] Using the advancements in technology, the desired results can be obtained. Biodegradable (wet waste) and non-biodegradable (solid waste) is currently being separated using manual methods (putting solid and wet waste into separate bins). These methods can be effectively used for manures, fertilizers, etc. But this isn't the same for dry waste. Dry waste may contain useful waste materials like metal, glass, paper, etc. which can be efficiently recycled and reused. A traditional method of dry waste segregation includes incineration i.e. burning of the waste. The tedious task to separate waste manually is inefficient. Hence, dry waste should be segregated in the initial stages only so as to prevent the hassle afterwards.

We are using Convolutional Neural Networks along with Machine Learning to implement this project. Previous studies regarding the project and system were based on similar lines.

The initial use of conveyor belts for segregation proved to be futile when it came to large scale waste segregation. Using CNN along with the dataset which are regularly updated, the system can be used at a minimum level which will help separate the waste materials.

The idea is to identify the object in front of the bin, run it through the dataset available to the system and then open the dustbin for the required garbage object. The whole process takes place in a matter of seconds.

# **II. LITERATURE SURVEY**

# A. Conveyor Belt Method

Segregation of waste using conveyer belts was also implemented. Bulk elements such as plastic, metal, rocks, stones, etc were removed easily depending upon the weight of the objects. Such method was useful for heavier objects but

separating fine particles, sand, organic waste was a difficult job. To get rid of unhealthy environment and health hazards the solid wastages must be taken care of by sorted into various components and then handled separately at the disposal for reused or recycling site. In order to recycle the solid wastages, they need to be segregated into various constituents. So, in this study, a mechanical machine for sorting of mixed domestic solid waste into its various component is designed. The machine is designed with the major components being the belt conveyor, roller conveyor, air blower and a magnetic separation. [2]

![](_page_71_Picture_0.jpeg)

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# B. Micro Controller Based

An Automatic waste segregator was proposed by Aleena V.J and team wherein they segregated the waste into three categories namely metallic, organic and plastic thereby making waste management more effective. They used ultrasonic sensors which were placed in the dustbins which gave the indication when the dustbin was near full to the micro controller. The micro controller will give the indication to the concerned authority. [3]

# C. Using Object Recognition and Detection

The use of Machine learning and neural networks into waste segregation was introduced by CS299 project group Gary Thung and Mindy Yang where they used a support vector system (SVM) with SIFT along with Convolutional Neural Networks (CNN) to classify images of a single object and to identify they accordingly into six different categories, metal, paper, plastic, trash, glass and cardboard. They achieved a 63 percent accuracy using SVM and 22 percent accuracy using CNN. However, their implementation involved classifying a single object image as

opposed to a jumbled waste.[4]

# **III.PROPOSED METHODOLOGY**

# A. Objective

# The main objective of the proposed system is:

1) To segregate the waste consisting of household, electronic, and general waste into their respective categories.

2) To apply machine learning and convolutional neural networks to make the segregation easier, faster and more efficient.

A Convolutional Neural Network (CNN or ConvNet) is a class of deep, feed-forward network that has been applied to analyse visual imagery.

# B. CNN Works on Three Layers

1) Layer 1: Convolutional Layer: Convolution is the first layer to extract features from an input image. Convolution preserves the relationship between pixels by learning image features using small squares of input data. It is a mathematical operation that takes two inputs such as image matrix and a filter or kernal [5]

![](_page_71_Figure_15.jpeg)

Figure 1: Example of CNN Architecture

- 2) *Layer 2: Pooling layer*: Pooling layers section would reduce the number of parameters when the images are too large. Spatial pooling also called subsampling or downsampling which reduces the dimensionality of each map but retains the important information. Spatial pooling can be of different types:
- *a)* Max Pooling
- b) Average Pooling
- c) Sum Pooling

Max pooling take the largest element from the rectified feature map. Taking the largest element could also take the average pooling. Sum of all elements in the feature map call as sum pooling. It does the two main things:

- *i*) It reduces the number of parameters within using down sampling
- *ii)* It generalizes the result from a convolutional filter. [6]


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Figure 2 : Max Pooling

*C. Layer 3: Fully Connected Layer:* The layer we call as FC layer, we flattened our matrix into vector and feed it into a fully connected layer like neural network. In the above diagram, feature map matrix will be converted as vector (x1, x2, x3, ...). With the fully connected layers, we combined these features together to create a model. Finally, we have an activation function such as softmax or sigmoid to classify the outputs as cat, dog, car, truck etc.



Figure 3 : Block Diagram

#### IV.IMPLEMENTATION OF PROPOSED SYSTEM

The first and foremost step is to train the images in the dataset for very accurate results. Large number of images are considered or given as a dataset.

- A. Hardware Components
- 1) Node MCU: The below is of Node MCU. NodeMCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the development kits. The firmware uses the Lua scripting language. Here it is used to interface servo motor which will be required to open the dustbin.
- 2) Servo Motor: A servo motor uses servo mechanism, which is a closed loop mechanism that uses position feedback to control the precise angular position of the shaft. Controlling servo is an easy task and needs no hardware as such.
- 3) Camera: A webcam is a video camera that feeds or streams its image in real time to or through a computer to computer network. When "captured" by the computer, the video stream may be saved, viewed or sent on to other networks travelling through systems such as the internet, and e-mailed as an attachment. Here the web camera is used to take the input image from the user which will be processed and compared with the data set for a match.



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B. Recognition and Detection of Image

Flow of how the image is recognised and detected:

- 1) Put the waste in front of the camera.
- 2) The lens of the camera captures the image of the waste object and sends to the system.
- 3) Tensor flow system identifies the object.
- 4) CNN algorithm detects and classifies the object. Thus, CNN will result the waste into the four categories.
- 5) Detection of the waste is done by the CNN algorithm. Array of pixels is taken as input.
- 6) The filter values are multiplied with pixel images.
- 7) Summation of output values is done and entire process is repeated for the whole image.
- 8) Further the output is max pooled, which has the maximum value in particular window by reducing the parameters and generalizes the convolution layer.
- 9) It then determines the features which most correlates to a particular class (dataset). Thus, the waste will be classified.
- 10) The result of classification will be given to NodeMCU.
- NodeMCU will be programmed so that it instructs the servo motor to open the desired bin and dump the classified waste into the respective bins. [7]

#### C. Software Algorithm

The following figure 5 shows how the data is send to the Firebase from the system. Go to firebase.google.com and sign up with your email-ID. Next go to Console. A dashboard appears click on : Database. Here, you will find your host url. Then from the NodeMCU the data is sent to firebase through an application.



Figure 5: System to Firebase

The following figure 7 show how the data is fetched from the Firebase to Node MCU. Firebase data is retrieved by either a one time call to Get Value Async() or attaching to an event on a Firebase Database reference. The event listener is called once for the initial state of the data and again anytime the data changes.



Figure 6: Firebase to NodeMCU

After the whole process of sending and fetching the data, trashcan will open according to the desired waste product. The servo goes to 50 degrees and hits the upper lid of the bin, so that the upper lid is opened, waits for three seconds, then automatically turns to 160 degrees and thus the upper lid gets closed. Hence we would see an auto open/close trash-bot.



International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887 Volume 7 Issue IV, Apr 2019- Available at www.ijraset.com

V. RESULT





Figure 7: Input image of plastic waste bottle

PLASTIC	Paper	JI-SH1
GLASS	METAL	

Figure 8: Dustbins of 4 categories connected to the servo motor

Figure 7 shows a plastic bottle considered as garbage whose image is taken as input through a camera. This image is compared with the available dataset through CNN. According to the algorithm it gives the desired probability of respective waste in given image. Figure 8 shows the four categories of waste and their respective dustbins. Each dustbin is connected to a servo motor which is interfaced with NodeMCU. Here the input image is plastic hence the algorithm runs and the servo attached to plastic labelled bin opens.

#### VI. CONCLUSION AND FUTURE SCOPE

We have successfully implemented the project where it detects the waste object and classifies it into categories namely glass, paper, metal, plastic. After classifying the object it also opens the respective bin of that category.

The project has a wider scope in future considering the idea behind the project is very practical and is in dire need of such applications in garbage segregation. There are various ways in which the project can be further improvised at a large scale level:

- *A*. The garbage collected in the bin will be near full at a certain time. Using wifi module or an application and sensors, this data can be sent to the janitor or concerned authority who will be intimidated to come and clear the bin.
- *B.* Another application can be to convert the bin into a robot and train it to dump itself after the bin is full. This could be implemented on single floor basis where collecting garbage from every room becomes a hassle. The bot can be programmed accordingly.



#### International Journal for Research in Applied Science & Engineering Technology (IJRASET)

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887

Volume 7 Issue IV, Apr 2019- Available at www.ijraset.com

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# THE NEXTGEN BOT

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*Abstract* —UN-manned 360 (photo or video) capture and control of the bot from any given location. The backbone and the pith idea of this project is to replace human intervention by bot during rescue operations carried out because of natural calamities like floods, fire breakouts or even during a terrorist attack. The concept is that the bot will imitate the actions of the human being, both of them will be in two different locations and the bot would be controlled remotely in the place of rescue operations. This bot works as a surveillance bot that will reach out to people who are in need of help thereby reaching areas where human intervention cannot be possible.

Keywords – Internet, Bot ,Human intervention

#### I. INTRODUCTION

The main aim of this project is that the bot will imitate human motion in the situation where human intervention is impossible or maybe lethal. Unmanned control of the bot from any remote location is what we are aiming to achieve. Although human figures can be present at certain places during emergency but it is not possible to be available everywhere and enter all places. So the idea of a bot is being implemented wherein this bot can act as a surveillance bot as well as a bot that can emulate human actions and achieve the given goal in any situation. Using IoT and Node MCU, it is possible to make a bot imitate the actions of the human controlling the bot. The human controlling the bot will be able to view the scenario that is displayed in front of the bot and will perform the necessary actions that is conducive to the given situation which will in turn act as an input to the bot so as the bot can imitate the given actions.

#### A. Motivation

The motivation of the project is that many lives are being sacrificed in the course to save others during a natural calamity, terrorist attacks, fire breakouts etc. The significance is that the human intervention is not needed which will ensure saving a life and if the bot is made to imitate human action which is in control of the person who is trained to do the same during such emergency situation, automatically saves the other life too. But the only difference will be, instead of that person physically being present at the scenario, the bot will be present for the rescue or to imitate any action or operation required at that moment. The application is not limited for just rescue operations but many more which is discussed in later part of this report.

#### B. Scope of the project:-

The bot will be travelling through the places as desired by the controller and imitate his action. This will help to deliver anything as a first aid. The gesture of the controller will be imitated by the robotic arm and the robotic vision can be viewed in Virtual Reality headset worn by the controller.

#### C. Outline of the project

Person will be wearing a Virtual Reality headset to have the robot view experience. For gesture control, he would wearing prosthetic arm attached with potentiometer . For joystick control, he would have the joystick in hand and would be trained prior to the execution about the corresponding buttons and control (as of now we are controlling through mobile, which acts as a joystick). The commands are pushed via internet and received at the bots end. Firebase is the major and most popular real time database system through which the real time changes can be achieved. Also there are many database systems that are similar to firebase for example blynk, through which the real time movements can be achieved easily. Hence via firebase or blynk kind of real time databases we can send the instructions and can see the real time execution of the same by the bot. The bot, if it is humanoid will be mounted with the exoskeleton, which will be helpful in lifting heavy objects

#### II. LITERATURE SURVEY

In the paper[1],Raj Kumar Mistri has presented that The Field of robotics has been exponential growth with the amalgamation of multiple domains. The holistic approach is proving to be a boon, where communication engineering, mechanical engineering, embedded system and so many more are together creating robot with high flexibility. Present technologies can only control robots up to a radius of 500 meters, but our aim in this project is to target controlling a robot from a remote location which is more than 1000 miles away. We use WIFI as the medium for communication.

In the paper[2],Partha Pratim Ray presented that IOT allows many applications that are very unique in nature and allows addressable things to communicate with each other like microcontrollers to itself and microcontrollers with other things or objects that can connect with internet. Although progressive advancements are made in this field we are getting many challenges which restrict the growth in this field. Robots are constantly getting enriched by easy development process, such vertical robotic service centric silos are not enough for continuously and seamlessly supporting for which they are meant for.

In the paper[3], Ankur Roy Chowdhury presented Synergy means adapting to user requirements and interaction patterns, these requirements modifies itself as a set of design principles for every layer in IOT. The aspects of Cloud Robotics and its role in aiding functions like sensing, manipulation, and mobility are considered as a tremendous advancement in the field of Internet of things. The examples of these are Intelligent transportation System endowed by an IoRT-inspiresd architecture.

In the paper[4],Ajay Singh Rajput and Kunal Borker as presented Wireless controlled surveillance bots are in huge demands as of today's world is concerned, bots which can be remotely controlled can be used to go anywhere humans cannot go. Bots can be wirelessly/remotely controlled using two ways, one by using bluetooth, but it has a short range and an another better way is by using wifi or internet. We can control a bot from anywhere using internet with your mobile device or any other hardware device.

In the paper[5],Cristina Turcu presented IOT is in demand for various purposes, like home automation, AI integration, Automation of machines. Robots can be of various types, like humanoid, bot types, etc.Robots can be integrated with internet by many means, we can connect via wifi or generate hotspot which can be used as a medium for connection. Robots connected to internet are of many uses, we can use it for long range social interactions,Virtual reality, surveillance, spying, etc. Internet will be the key source and as of now they are available at ease.

#### III. OBJECTIVE

Our main objective is to develop a system based on real time database changes according to the given corresponding command. This bot can be anything ranging from a vehicular bot, drone, boat or even a humanoid bot. To provide real time information about progress through the video stream that will make the controller understand the scenario to take further decisions accordingly.

#### IV. PROPOSED SYSTEM

The bot uses blynk server as a back end and via which we control the bot in real time. The person controlling the bot will wear prosthetics and will control the robotic arm (mounted on the bot) by gestures, he/she will do some gestures by which the values of potentiometer on prosthetics changes accordingly, and that values gets pushed to firebase which acts as a Real time Database which is an entity for communication between the nodemcu on prosthetics and nodemcu on robotic arm. The values that are pushed to firebase will be retrieved by another nodemcu which is controlling robotic arm, and the robotic arm does action according to the values received. As far as bot control is concerned it is completely controlled through mobile via blynk server as a back end, we can control the bot from any location as it is controlled through internet, which makes controlling range-less. The person controlling the bot will wear Virtual Reality headset, to get the experience of bot vision (seeing surroundings through bot's perspective).

#### V. TECHNOLOGY USED

The following tools are used for the creation of the system:

#### A. Firebase/Blynk -

Firebase is a real time database. It is an entity in between the NodeMCU encircling the communication .It also act as an medium to push and retrieve data .Blynk acts as an back end server (real time ) to control the motion of the bot

#### B. NodeMCU -

NodeMCU is the major component, which acts as a transmitter and receiver. It is also the controller for our bot which is used to control dc ,servo motors and for WiFi connectivity esp8266 is embedded in this controller/developer kit.

#### C. Sensors -

1.Potentiometer is used to send values according to the controllers gestures . 2.GPS is used to track the location of the bot .

#### D. Vision

1. Virtual Reality headset is used to experience the real time video streaming from the robotic vision.

2.Camera:(MI CAM) is used as robotic vision and to live stream the data as well as save it for future purpose.



#### VI. SYSTEM INTERACTION

Fig 1. Overall System Flow



Fig 2. Use case of the proposed system.

In the above flow diagram, a man controlling the bot is wearing a Virtual Reality headset through which the person is able to have bot's vision. As per the current vision and the actions to be taken, the person makes arm movements and control the motion of the bot, the data values of the movements is pushed to firebase through nodemcu. On the receiving part, corresponding data from the firebase is fetched in the nodemcu and is provided as an input to the bot. The actions as per the data is followed by the bot.

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Fig 3. To track the location of the bot and the buttons to control the movement of the bot.



Fig 4. Image of the vehicular bot with an arm mounted on it.

Data	abase 🗧 Realtime Database 👻
Data	Rules Backups Usage
	← https://nexten-8b.firebaseio.com/
	nexten-8b
	<b>pot1:</b> 1143 <b>pot2:</b> 923

Fig 5. The potentiometer values for the movement of the arm in realtime database.

#### VIII. CONCLUSION

In this paper, we proposed an innovative approach [6]to pick and place any light weighted object from any remote location using Virtual Reality where it shows the vision of the bot. For the motion of the bot, we make use of very simple yet effective blynk server through which the motion of the bot is controlled. For the arm movement of the bot, we have used firebase as a medium to pass data from the sender side to the receiver side. The location of the bot is traced by GPS module. As for future work, we will put efforts in implementation part in enhancing [6] the vehicular bot to a humanoid bot in order to imitate the movements of the human from any given location.

#### IX. ACKNOWLEDGMENT

We would like to express our deep sense of gratitude to all those who have given their valuable counseling and assistance during project work. We would also like to offer our profound gratitude to the management for giving us this opportunity of our theoretical knowledge with practical experience. We would like to thank our project guide and coordinator Prof. Kalyani Pampattiwar and Prof.Preeti Hemnani for sharing their pearls of wisdom with us during the course of this research. We also want to thank our Principal, Dr. Vikram Patil and our HOD, Dr.Rizwana Shaikh, all the teachers for their support and helping us in solving many of the hardship.

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# 32-BIT PROCESSOR DESIGN on FPGA

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Abstract—With the increase in the use of the FPGA in variousembedded applications, there is a need to support processor designs on FPGA. The type of processor proposed is a soft processor with a simple instruction set which can be modified according to use because of the re-configurable nature of FPGA. The type of architecture implemented is Von-Neumann. Prominent feature of the processor is pipelining which improves the performance considerably such that one instruction is executed per clock cycle. Due to the increase in innovations in development of processors and SOCs(System on-chips) and the increasing popularity of open source projects like RISC-V ISA(Instruction Set Architecture) there is a need to also rapidly understand these designs and also upgrade them which can easily be performed on FPGA with trade off in speeds, size as compared to commercial ASIC processors, and hence we are motivated to understand these systems.

This paper describes the realization of a 32-bit, 5 stage pipelined FPGA based processor. Our system was implemented on Xilinx Spartan 6 XC6SLX9-3CSG324 using xilinx ISE 14.1 and verilog. A total of 347(6%) slice LUTs, 66(33%) bounded IOBs were used with a total on chip power of 0.014W.

Keywords— FPGA, RISC-V, SOC, Von-Neumann, Pipelining, Spartan 6, Verilog

#### I. INTRODUCTION

Microprocessors are widely used in a variety of electronic devices such as laptops, PCs, embedded systems, etc. The Central Processing Unit(CPU) works as the brain of the entire arrangement as it decides the capabilities of the system. There are two ways of manufacturing a processor; Application Specific Integrated Circuits(ASICs) or they can exist in the form of soft processors such as Field Programmable Gate Arrays(FPGAs) [1]-[2].Our project is FPGA-based 32-bit processor designed usingthe Verilog language mainly consists of total thirty two 32-bit registers(R0 to R31), a 1024 word memory with 32-bit words, a control unit and an Arithmetic and Logic Unit (ALU). Because of the advantage of real-time in-circuit reconfigurability make the FPGA-based microprocessor flexible and more reliable.

In this paper, a low cost 32-bit RISC processor has been designed using Verilog and synthesized. Reduced Instruction Set Computer (RISC) architecture focuses on reducing the number and complexity of instructions in the machine. RISC is a design technique used to minimize the amount of area required, complexity of instruction set, instruction cycle and cost during the implementation of the design.

The paper describes the design and synthesis of a basic 5 stage pipelined MIPS-32 processor for finding the longer path delay using different process technologies [3]-[4].

MIPS (Microprocessor without Interlocked Pipelined Stages) is a kind of RISC architecture developed by MIPS Computer Systems which is an American company that is now called MIPS Technologies. The large propagation delay or critical path within the circuit and improving the hardware which causes delay is a standard method for increasing the performance.

The final design was synthesized and mapped on xilinx spartan-6 FPGA board [5]-[6]. The kind of architecture we have used is Von-Neumann, where the instructions are loaded from the top and the data memory occupies the lower half. In implementing the soft Processor, we have understood the microarchitecture and have also generated their RTL models. Thus, it is clear that FPGAs are symbolically different in comparison to ASICs on several aspects like speed of memory and logic [7].

In the end, power estimation tool was used to analyse various parameters related to power and it was found that it utilizes low power.

The FPGA provides efficient CPU utilization, higher memory capacity & data rates, extended systems features for many applications to replace the existing microcontrollers [8].

Hence, we are motivated to understand the microarchitecture of a simple processor, with a small instruction set, which can easily be modified and used in upcoming embedded applications.

#### II. INSTRUCTION SET

All the processor instructions can be classified into 3 groups in terms of instruction encoding.

1)R type (Register)

2)I type (Immediate)

3)J type (Jump)

In the instruction encoding, 32 bits of instructions are divided into several fields of fixed widths. All instructions may not use all the fields. Since the relative positions of some of the fields are same across instructions, decoding these instructions is very simple.

#### A. R-type:

In R-type, an instruction can use up to 3 register operands two source and one destination. In addition, for shift instructions, the number of bits to shift can also be specified.



Fig. 1 R-type Instruction Set

#### B. I-type:

I-type contains a 16-bit immediate data field. It supports one source and one destination register.



Fig. 2 I-type Instruction Set

#### C. J-type:

J-Type contains a 26-bit jump address field. It is extended to 28 bits by padding two 0s on the right.



III. MICROPROCESSOR DESIGN

Our processor consists of multiple pipelined stages. The stages are classified as :Instruction Fetch stage(IF), Instruction decode stage(ID), Execution stage(EX), Memory write back stage, and register write back stage. Each stage is separated by a register buffers for pipelining. Consecutive stages are fed with two separate clocks and alternate with same clocks. These two clocks are non-overlapping, half cycle separated clocks to ensure certain guard band.

Taking an instruction example: ADD R1,R2,R3

#### A. IF-stage

As the name suggests, in this stage the instruction is fetchedfrom the instruction memory. This is done using a special register called program counter (PC). Every instruction is 32bit wide and every memory word is also 32 bits, therefore,each memoryword has a unique address. The PC stores the value of this address. The value pointer by program counterin the memory is the address of instruction, this instruction is given to instruction register(IR $\leftarrow$ Mem[PC]). The value of new program counter register is also incremented by 1, i.e, (NPC $\leftarrow$ PC + 1).



#### B. ID-stage

The instruction is fetched from the instruction register or decoded. The opcode field is 6 bits(bits 31:26). First Source operand Rs(bits 25:21), second source operand Rt(bits 20:16) is present. The last stage is 16 bit immediate data field(bits 15:0). In case of jump instruction, the data field is 26 bits(bits 25:0). The register operands along with data field from the instruction are read in parallel. This is possible because these fields are in fixed location in the instruction format. This stage also uses sign extension where the immediate data is sign extended to make it 32 bits. For 16 bit data, 16 bits of MSB are added before the data bits and in case of 26 bits, 6 bits of MSB are added. In this stage, the value of first source register R2 is given to register A and second source register R3 is given to B from the register bank.(A $\leftarrow$ Reg[rs1]; B $\leftarrow$ Reg[rs2]).



#### C. EX-stage

This is the stage where actual computation on given data is performed, depending on the type of instruction which is determined from the ID stage. Among NPC, A, B and IMM, two are selected and their value is given to the ALU. In the **ALU** (**Arithmetic and Logic Unit**) block, depending on the type of instruction either arithmetic, logical, shift, comparison operation is performed. For branch type instructions, value of register A is compared to zero using a comparator and branch condition is accordingly checked. Since the type of instruction is ADD(for the example), which has a specific opcode value, addition is performed in the ALU and the result is stored in the ALU output register.(ALU output $\leftarrow A + B$ ).



#### D. MEM-stage

This is the memory write-back stage where result obtained from EX stage is written at a specific memory location or read from it. This stage is used only in case of Load and Store instructions. In case of other instructions, this stage is simply ignored. For storing instructions, memory data is loaded in register LMD.



#### E. WB-stage

In the final stage of the processor, data generated by the ALU is written back to the register bank in case of register type instructions. Here there are two possibilities, the data can either come from the memory in case of LOAD type instruction which is loaded into the register LMD or it can come from the EX stage, hence accordingly data is selected from the two and given to the register bank. The address of the register at which data is to be stored is specified in the instruction encoding(R1-R32).



#### IV. IMPLEMENTATION AND RESULTS

Following results were obtained on Xilinx power estimator of spartan-6 for the implemented processor.

Parameter	Value
Junction	25.4
Temperature	degree C
Total On-chip	
Power	0.014 W
Airflow	250 LFM
	26.2
	degree
Effective JA	C/W

#### TABLE I Device Summary Report

Device Utilization for the implemented 32-bit processor onSPARTAN-6 FPGA:

	1		
		A	
		v	Ut
	τ	ai	ili
	S	la	zat
	e	bl	io
Logic Utilization	d	e	n
		1	
		1	
	1	4	
	9	4	1
Number of Slice Registers	8	0	%
		5	
	3	7	
	4	2	6
Number of Slice LUTs	7	0	%
	1	4	
Number of fully used LUT-FF	3	0	33
pairs	6	9	%
		2	
	6	0	33
Number of bonded IOBs	6	0	%
		3	6
Number of Block RAM/FIFO	2	2	%

TABLE I Synthesis Report

The simulation has been performed on Iverilog. Table III indicates the result of the simulation for the proposed 32-bit processor.

	Mnemoni	
Opcode	с	Operation
32'h280	ADDI	
1000A	R1,R0,10	R1=R0+10
32'h280	ADDI	
20014	R2,R0,20	R2=R0+20
32'h280	ADDI	
30019	R3,R0,25	R3=R0+25
	OR	
32'h0C	R7,R7,R	R7=R7 —
E77800	7	R7(WPO)
	OR	
32'h0C	R7,R7,R	R7=R7 —
E77800	7	R7(WPO)
	ADD	
32'h002	R4,R1,R	
22000	2	R4=R1+R2
	OR	
32'h0C	R7,R7,R	R7=R7 —
E77800	7	R7(WPO)
	ADD	
32'h008	R5,R4,R	
32800	3	R5=R4+R3
32'hFC		
000000	HLT	STOP

#### TABLE III Nine Instruction Program

Signals	Waves												
Time	0				10	) sec						200	sec
clkl=													
c1k2 =:										1			
PC[31:0] =	0+ 00000001	00000002	00000003	0000000	4 00000005	00000	106 000	00007	00000008	00000	000 000	0000A	0000000B
IF_ID_NPC[31:0] =:	x+ 00000001	00000002	00000003	0000000	4 00000005	00000	000	00007	00000008	00000	000 000	0000A	0000000B
IF_ID_IR[31:0] =:	x+ 2801000A	28020014	28030019	0CE7780	0	00222	100 OCE	77800	00832800	FC000	)00 <b>ж</b> ин	XXXXX	
ID_EX_A[31:0] =:	**************************************	000			0000007		0000000A	00000	007 00	00001E	00000000	xxx	****
ID_EX_B[31:0] =:	xxxxxxxx 00000	00000	0000	0003	0000007		00000014	00000	007 00	000019	00000000	XXX	XXXXX
ID_EX_Imm[31:0] =:	*****	00000 A00	0000	0019	00007800		00002000	00007	800 00	002800	00000000	XXX	xxxxx
EX_MEM_ALUOut[31:0] =:	*****	0000000A	00000014	0000001	9 00000007		000	0001E	00000007	00000	)37		
MEM_WB_ALUOut[31:0] =:	*****	00000	0000 A00	0014	00000019	000007		00000	01E 00	000007	00000037		
<pre>MEM_WB_type[3:0] =;</pre>	x	1			lo							5	
MEM_WB_LMD[31:0] =:	****												

Fig. 2 Timing diagram for the nine instruction program after execution obtained on GTKwave

#### V. CONCLUSION

Pipelined 32-bit RISC based processor was designed and implemented on Xilinx Spartan 6 FPGA using verilog. Gtkwave, i-verilog and xilinx ISE platform were used for test and simulation. Five stage pipeline was used which improved performance. The various power metrics were analysed, with a total device utilization of 347 slices. The instruction set is small yet powerful and can easily be reconfigured according to need in future.

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#### ICSE International Journal of Computer Sciences and Engineering Open Access E-ISSN: 2347-2693 **Research Paper** Vol.-7, Issue-5, May 2019

### **Energy Management Using IoT**

P.S. Jadhav<sup>1\*</sup>, S.K. Konde<sup>2</sup>, T.A. Pawar<sup>3</sup>, S.S. Sawant<sup>4</sup>, A.N. Kemkar<sup>5</sup>

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DOI: https://doi.org/10.26438/ijcse/v7i5.15431546 | Available online at: www.ijcseonline.org

Accepted: 13/May/2019, Published: 31/May/2019 Abstract— Energy is a very important aspect for any household, industries, agriculture and so. Managing the energy efficiently and conserving it intelligently for appliances is very much important. The energy usage is directly affected with Coal, oil and so towards power generation. Towards this, there has been lot of research work carried out in developing some smart lighting system pertaining to classroom for conserving the energy. So with the upcoming of machine to machine communication where devices can be connected wirelessly leading to IoT, we here have developed an IoT based Smart Energy Management system where appliances like Fan and Bulb to start with are controlled wirelessly based on user input. These inputs are used towards controlling the appliances intelligently rather than just switching on or off. In addition, the system also keeps computing throughput the day power consumption of the appliances which gives the user knowledge on power being consumed over a period of time. These details are updated in Cloud server. This prototype system developed have achieved energy conservation at every household.

Keywords:- IoT, KVA HT, LDR, RFID.

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#### Kinematic Synthesis of Overlay Welding Station Of Elbow

Pradip P. Patil<sup>1</sup>, R.S. Nehete<sup>2</sup> <sup>1</sup>(Associate Professor, SIES Graduate School of Technology, Nerul, Navi Mumbai, India-400706 <sup>2</sup>(Professor, SIES Graduate School of Technology, Nerul, Navi Mumbai, India-40070

Abstract: Overlay welding also known as cladding, is a process in which one or more metals are joined together by welding to the surface of a base metal as a layer in order to improve the corrosion resistance strength of the base metal. in case of conventional type of automatically welding machines, overlay welding of inside surface of elbows cannot be done accurately as there are many areas were the welding torch cannot reach due to curvature effect of the bent section. As a result it became a common practice to perform the reach due to curvature eject of the bent section. As a result it became a common practice to perform the welding by hand with the consequent decrease in productivity. The purpose of this paper is to find a solution so that the complete overlay welding of elbow can be done by welding arm itself and thereby increasing the efficiency of the production with no need of manual welding. By studying the required motion of the welding torch, physical constraints due to inner overlay in the elbow a

feasible solution that can be applied in mass production is obtained. A mechanism was designed according to the motion of the welding torch tip using kinematic synthesis and its development is presented in this paper. Keywords: Welding, cladding, Elbo, Kinematic Synthesis

#### I. Introduction

Numerous industrial applications require metallic cladding on interior surfaces of metallic pipe with materials to protect against corrosion, abrasion, surface contamination and improved impact resistance. For this purpose, it is preferable to use cladding bends that are of substantially circumferential orientation particularly in applications where the pipe is intended to carry highly abrasive materials uch as tar sand slurries. Circumferential application of metallic cladding is relatively simple for straight section of pipeAffeticate Windc application is considerably more difficult in the case of curved pipe sections such as pipe clows. For the foregoing reasons, there is a need for apparatus for helical deposition of metallic cladding to interior surfaces of curved nine sections, where the annaratus is readily configurable for use with nine sections

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Application of DMAIC and SPC to Improve Operational Performance of Manufacturing Industry: A Case Study

# Lokpriya M. Gaikwad, Vivek K. Sunnapwar, Shivanand N. Teli & **Akshay B. Parab**

Journal of The Institution of Engineers (India): Series C Mechanical, Production, Aerospace and Marine Engineering

ISSN 2250-0545 Volume 100 Number 1

ISSN 2250-0545 (print version) ISSN 2250-0553 (electronic version)

**Journal** of



ISSN: 2249-877X Vol. 9, Issue 2, February 2019, Impact Factor: SJIF 2018= 6.206 South Asian Journal of Marketing & Management Research (SAJMMR) (Double Blind Refereed & Reviewed International Journal) DOI NUMBER: 10.5958/2249-877X.2019.00006.7 LEAN - GREEN - SIX SIGMA APPROACH IN GLOBAL MANUFACTURING USING INDUSTRY 4.0 Lokpriya M.Gaikwad\*; Dr. Vivek K.Sunnapwar\*\*; Dr. Kaustubh Chavan\*\*\* \*Research Scholar, Department of Mechanical Engineering, Sardar Patel College of Engineering, Mumbai, INDIA Email id: lokpriya2007@gmail.com \*\*Professor, www.IndianJournals.com mbers Copy, Not for Commercial Salo 180.151.4.186 on dated 26-Department of Mechanical Engineering, Lokmanya Tilak College of Engineering, Navi Mumbai, INDIA Email id: vivek.sunnapwar@gmail.com \*\*\*Assistant Professor, Department of Mechanical Engineering, SIES Graduate School of Technology, Navi Mumbai, INDIA Email id: kaustubh.chavan@siesgst.ac.in

ABSTRACT





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On Complex Value Ashwinkuma 1 Assistant Professor, SIES Graduat 2 Head, Associate Professor, Department of Ma	ed Rectangular <i>b</i> -metric Spaces r R Chavan <sup>1</sup> , Uttam. P. Dolhare <sup>2</sup> te School of Technology, Nerul, Navi Mumbai-400706 athematics, D. S. M. College, Jintur, Dist. Parbhani, Maharashtra India 431509
In this paper, we have discussed the concept approach. Ozgur Ege introduced complex contraction principle in this space. We have e space. Keywords: Fixed points, b-metric space, recta	of complex valued rectangular b-metric space in more general valued rectangular b-metric space and also proved Banach extended some results using complex valued rectangular b-metric angular metric space, and rectangular metric space.





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	A NOTE ON FIXED POINT THEORY AND ITS	DEVELOPEMENT				
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ON PARTIALLY ORDERED METRIC SPACES WITH A FIXED POINT THEOREM OF CONTRACTION TYPE MAPS AND ITS APPLICATION TO ORDINARY DIFFERENTIAL EQUATION

UTTAM. P. DOLHARE  $^1$  , ASHWINKUMAR R CHAVAN  $^2$ 

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#### Abstract

In this paper we have discussed the generalization of contraction condition in partially ordered metric space and its application to ordinary differential equation.





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Polyaniline/ZnO nanocomposites for the removal of methyl orange dye from waste water

Neha V. Nerkar\* and Subhash B. Kondawar<sup>†,‡</sup>

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> Accepted 13 April 2018 Published 4 July 2018

In this paper, we report the safe removal of methyl orange (MO) dye from aqueous solution using chemical interaction of dye molecule with polyaniline/zinc oxide (PANI/ZnO) nanocomposite. PANI/ZnO nanocomposite has been prepared by in situ polymerization. PANI/ZnO nanocomposite was found to be the best promising candidate for adsorption of dyes due to more porosities compared to that of pure PANI. In the present investigation, PANI/ZnO nanocomposite was mixed in a solution of MO dye and used for adsorption process. Color removal was studied using UV-Vis spectroscopy and the spectra were recorded for specific time interval and validation of kinetic model has been applied. Absorbance of PANI/ZnO nanocomposite was found to be increased as compared to that of pure ZnO nanoparticles and pure PANI due to synergistic effect. Comparatively, the removal of dye was also found to be more by using PANI/ZnO nanocomposites. In order to evaluate kinetic mechanism the pseudo-first-order model, pseudo-second-order model and intraparticle diffusion models were verified by the linear equation analysis. Adsorption mechanism of pseudo-second-order model was systematically explained for removal of dye using PANI/ZnO nanocomposite. The results clearly demonstrated that the adsorption mechanism gives very novel and green method of removal of hazardous

Keywords: ZnO nanoparticle; polyaniline; nanocomposites; adsorption; kinetic model.

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	Akhil Appu Shetty; V.I. George; C. Gurudas Nayak; Raviraj Shetty
	DOI: <u>10.1504/IJISTA.2020.110034</u>
405-420	<u>Neural network decoder for (7, 4) hamming code</u>
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