

# Parameter Dependencies and Optimization of True Random Number Generator (TRNG) using Genetic Algorithm (GA)

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**Abstract-** In the hostile environment, use of pseudo-random numbers in encryption algorithm has become difficult due to increased computing power of attackers. To overcome from the hackers true random number generator solving by giving unique random sequence. Authors recommend based on experiment to add parameters dependencies of analog Phase-Locked Loop (PLL) based on TRNG, and it also tries to optimize few parameters using Genetic Algorithm (GA). The proposed approach selects optimum values for different parameters and increases flexibility, resource utilization, throughput. Digital architecture for optimized TRNG is obtained using Altera platform. Implementation the optimized TRNG on ALTERA QUARTUS-II DE0 board gives enhancement R and S parameters by 42.18% and 38.67% respectively.

**Keywords-** Pseudo-random numbers Generator (PRNG); Encryption algorithm; (TRNG); PLL; Optimization; Genetic algorithm (GA); Bit rate; Sensitivity to jitter.

## I. INTRODUCTION TO HARDWARE –SOFTWARE CO-DESIGN IN DIGITAL SYSTEM DESIGN

Arbitrary numbers are urgent in various cryptographic applications, for example, measurement, cryptography, and even workmanship. Irregular numbers utilized must satisfy rigid security prerequisites with reasonable measurable boundaries and adequate degree of eccentricities. With expanding registering intensity of assailants, it is getting hard to utilize pseudo-irregular numbers, as there can be odds of determining next arbitrary number succession. The arrangement is to utilize genuine irregular numbers however much as could reasonably be expected. There have been endeavors to produce arbitrary numbers with various techniques, for example, discrete-time disorder, metastable inspecting, direct intensification, and so on, and each sort of approach is having its specific application region [1]. The irregular numbers ought to be produced at fast to keep the assailant from anticipating next arbitrary number arrangement. Simultaneously, arbitrary numbers created must have adequate degree of security for example yield TRNG ought not to be one-sided with contribution anytime. However, because of conditions of speed and security on various boundaries, accomplishing fast and security simultaneously is

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not really conceivable. Additionally, to that, any little combination in these boundaries affects the system. This lead to a progress of a numerical appear as information abdicate relations in arrange to achieve cautious boundaries setting as contradicted to going for preparatory tries. Be that as it may, this can be accomplished by utilizing progressed advancement procedures as apparatuses for acquiring the ideal boundaries setting for the TRNG viable [2]. The two free running electronic oscillators [3] [4] are utilized, and their recurrence precariousness is utilized to deliver TRNG. On the comparative ground, another plan is presented [5] where a yield of a straight input move register (LFSR) and a cell robot are haphazardly examined. The plan proposed in [6] utilizes enhancement and testing of background noise delivering TRNG. It comprises of basic and progressed parts. It brings around higher constrain utilize by escalated organize to bring commotion level to the degree of progressed basis level. The comparative thought utilized by Intel Organization [4] in which warm clamor is escalates and utilized to drive voltage controlled oscillator (VCO) which is at that point surveyed by another oscillator. The creative organize subordinate on metastable circuits is proposed in [7]. In proposed work; endeavors are done to illustrate the centrality of cutting edge headway method within the field of boundaries change of TRNG so the creators can accomplish their destinations alongside fulfilling different limitations and cut-off points of the model. In [1] and [8] examining of nerves in stage bolted circle (PLL) as a simple part is utilized to deliver TRNG. In this paper, the age of TRNG with following oddities: (a) Fitness work is proposed as far as R, S, BW and ND; (b) Constraints as far as nonlinear balances, ordinary equities, and limits are indicated to augment wellness work with ideal determination of wellness boundaries; (c) Optimum estimations of boundaries, for example, KM, KD and FREF are chosen expanding R, S and ND with proficient equipment use utilizing hereditary calculation.

This paper is organized as follows—Section II talks around the natural central of era of jitter and extraction. Section III gives detail description of fitness parameters used. Section IV discusses fitness function and genetic algorithm. Section V shows simulation results. Hardware implementation is stated in section VI. Section VII describes NIST- statistical test and conclusion and future work is explained in section VIII.



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## NOVEL ARCHITECTURE FOR 16\*16 BINARY MULTIPLICATIONS USING REDUNDANT TECHNIQUE

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### Abstract

The aim of the paper is to implement 16\*16 bit binary multiplication using optimized architecture. The proposed architecture reduces the product term and use of parallel architecture concepts leads to improve performance and reduces time complexity. Hardware implementation done through reversible gate on DE2 Altera board and verified the hardware using test benches. Time complexity of the calculation is  $n^{1.58}$ . Equal expansion of two n-digits repetitive parallel numbers can be acted in a consistent time, free of n without convey spread, n bit augmentation is acted in a period relative to  $\log_2 n^{1.58}$ . Performance percentage improvement is 21.66%.

**Keywords:** Binary multiplication, Hardware architecture (HA), redundant technique, Field Programmable Gate Array (FPGA).

### 1. Introduction

Processors are a piece of incorporated circuits; enormous quantities of functionalities are stuffed in an IC as a result of colossal development in thickness of incorporation as of late, since the quantity of capacities expands and the prerequisite for calculations are additionally develops. With the presence of most recent interaction advances, contracting of highlight size

[11248]





Article

# A Simplified Output Feedback Controller for the DC-DC Boost Power Converter

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**Abstract:** Boost-type dc-dc converters present non-minimum phase dynamic system characteristics. Therefore, controller design using only the output voltage for feedback purposes is not a very straightforward task. Even though output voltage control can be achieved using inductor current control, the implementation of such current-mode controllers may require prior knowledge of the load resistance and also demand more states such as one or more currents in feedback. In this paper, the development of a new output feedback controller for boost-type dc-dc converters is presented. The controller form is such that it avoids the possibility of saturation in the control signal due to division by zero. The basic structure of the proposed controller is firstly obtained from the expression of the open-loop control signal, and the complete controller structure is then derived to satisfy the closed-loop stability conditions. Simulation and experimental results clearly verify the ability of the control law to provide robust regulation against parameter variations.

**Keywords:** DC-DC converter; boost converter; output feedback control

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## 1. Introduction

Step-up dc-dc converters are used in various applications, such as energy generation using renewable resources, electric vehicles, hybrid electric vehicles, and so on [1–3]. However, the output voltage regulation of these converters is not a very straightforward task, as they exhibit non-minimum phase dynamic system characteristics [4]. This does not easily allow control of the output voltage using a single voltage sensor. To address this, voltage regulation is usually achieved by controlling the inductor current in the converter [4–8]. In ref. [5], a linear state feedback along with an integral action based on output voltage is employed to implement current-mode control. In ref. [6], it has been shown that a current-mode control scheme consisting of a proportional-current feedback and an integral voltage-feedback is sufficient to regulate the quasi-resonant converter. Moreover, a non-linear controller of the exponential form has been attempted in [7]. Even though the indirect approach of regulation discussed in refs. [5–7] offers several advantages, including faster transient response as well as overload protection [7]; this approach has a certain drawback: it requires the usage of a reference inductor current to realize the control law. The reference inductor current in turn is computed using the load resistance  $R$  term. In practical systems  $R$  could be unknown and also could vary. To address this, an adaptive control law [9–11] can be used. However, it incurs complex hardware circuitry, and it is still required to sense the inductor current, which results in extra cost and complexity due to the use of an additional current sensor.

Recently, sliding-mode control (SMC) has become a popular control methodology for regulating boost-type dc-dc converters [12–21]. The traditionally used hysteresis-modulation (HM) based SMC has many benefits, such as simplicity of realization and being





# Gesture Based Robotic Vehicle

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**Abstract**— The critical reason of this corporation is to increase a passage system to control a robot by using the use of misuse MEMS in particular based totally absolutely assessing form. MEMS might be a hint Electro Mechanical discoverer that is a touchy and healthful for police paintings the tilt. This locator unearths the lean and makes use of the accelerometer to transport the orientation of the robot looking on tilt. This undertaking uses a touch controller, that is modified, with the assist of delivered C headings. This microcontroller is provided for act with transmitter and beneficiary modules. The MEMS basically primarily based identifying phase acknowledges the lean and gives the records to the microcontroller (on board computer) and besides the controller settles on a desire about whether the direction is correct development or left improvement direction and controls the course severally. The controller is interfaced with dc automobiles to manipulate the path of the robotic.

**Keywords:** Arduino(ATMEGA328), measuring instrument, DC motors, RF Transmitter & Receiver.

## INTRODUCTION

Robots are controlled abuse hand movement thusly robots may need an assistance whether or now not it must be any work, while no longer human robots can't be operated. The most purpose behind misuse hand sign is that it provides different schematic system for winning the machine what's more, with this choice robot might be utilized as a seat or as a riddle ace robotized or for alert. As human hand developments are standard, with the assistance of wireless dispatch, it will in general be progressively direct to move with the machine in an incredibly progressively considerate manner. The robot's development will depend upon the movements made by strategies for Hand. The goal of this paper is to build hand gesture controlled robot that can be used in homes, hospital, shops, etc. where contact less delivery is necessary considering situation. This project basically contains two circuit. The hand gestures are converted into electrical signals by the ADXL335 accelerometer sensor, and the ATMEGA328 processes the incoming signals and sends it to the RF transmitter. In the receiving end, these signals are received by the RF receiver and sent to the ATMEGA328 for decoding. The ATMEGA328, on receiving the signals, actuates the motors via motor driver. The gadget moves ahead, backward, proper and left while we tilt our palm to earlier, on this manner spherical, right and left severally and correspondingly the robotic stops once our palm is parallel to the again.

## II. PROJECTED WORK

The whole enterprise is a part into two regions one is transmitter zone and opportunity is gatherer element. The transmitter model is confirmed up in choose 5, and in like manner the transmitter element carries one Arduino, one three-rotate evaluating tool and one RF transmitter module. The gatherer model is showed up in figure Six. The beneficiary segment incorporates 1 RF recipient module, one motor riding force IC, two PMDC motor, wheels. Plainly right here, separate 5 volt electricity supply is utilized to each the regions. As time is going on, the Arduino explores the number one yield regards, stimulate flip and compose centre point worths from the three centre assessing instrument and changes over the straightforward motivating force to various electronic worth.

The modernized characteristics are dealt with by techniques For the Arduino and ship to the RF transmitter that's conquered the Receiver and is university on the beneficiary completing which drives the motor to a distinct direction. The computerized moves, in reverse, proper and left as soon as there perhaps tilt inside the palm of buyer in forward, on this fashion around, tested and left severally.



# Battery Monitoring System for Electric bike

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**Abstract**— With the increase in demand for smart intelligent devices, integration of smart systems in automobiles has gained large attention in recent times. To develop the intelligent smart systems, installing vehicle sensors and processing data from them is the key fundamental step. Due to the limited range and long charging time for electric vehicles, proper utilization of the stored battery energy is crucial. To address the challenge of range anxiety we have developed a system that focuses on how an E-bike's remaining range can be accurately predicted. This system is designed to capture certain critical data from vehicle sensors and process the data which can later be processed for intelligent system development and to display the relevant information for the rider. With IOT application data can be transmitted at real time and this is an entirely new era in the transportation sector which leads to intelligent connected transportation systems.

**Keywords**— IOT, electric vehicle, range prediction, intelligent system.

## I. INTRODUCTION

Electric vehicles are more environment friendly in transportation as there is no inflicting air pollution or noise pollution. There are certain automobile sector they convert old petroleum bike into electric bike. In these electric bikes electrical motor that is BLDC motor is used instead of combustion engine because BLDC motor delivers effective torque and speed as compared to IC engine. This bike utilizes chemical energy stored in rechargeable battery packs. Lithium ion battery pack is used as it is smaller to be compared with lead acid. These converted electric bikes do not have the feature of displaying the battery percentage, speed, voltage and other certain parameters as that of recent E-bikes.

However range anxiety can be a significant barrier to the adoption of electric vehicles. This is an important problem because range anxiety i.e. the fear of running out of battery with no place to recharge it before reaching the destination is the major barrier to the adoption of electric vehicles. The another issue faced is the current automobile industry is struggling with the issue of lack of information about the performance of product and during its usage. This paper presents an effort on how we can combine sensor's data and cloud connectivity technologies to resolve the issue of range prediction and displays the useful information for the user and the manufacturer.

Thingspeak is an open IOT platform that permits to collect, analyze and act on collected data. A user anywhere on the planet looking at this information will get to know how many Km bike can be travelled and voltage of battery pack. The local unit (UNO/ESP-01) will capture data from sensors and send this data to the internet writing on a specific thingspeak.com status channel.

## II. LITERATURE REVIEW

The paper presents an effort on how we can combine automobile, data processing and cloud connectivity technologies which are fundamental in establishing a connected vehicle system demonstrated by Ramesh Babu in "informatics and infotainment system for smart E-bike using raspberry pi".

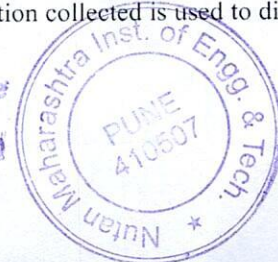
The paper on battery monitoring system consists of master control unit utilizes the message to estimate the batteries SOC and SOH. The data exchange between the smart phone and lower machine can be achieved via Wi-Fi. Accordingly a Wi-Fi sending and receiving module is added to the system as follows: the battery status information is sent to mobile phones via Wi-Fi and lower machine could obtain the commands sent by mobile phones. Information displayed on the mobile phone: cell voltage, equalization status, battery pack voltage, temperature and SOC.

The paper on Range prediction for EVs was cast as a multi-objective problem with conflicting objectives. Two approaches were considered: one assuming constant battery voltage and the other allowing battery voltage to be a function of SOC demonstrated by Warren Vaz, Arup.K.R.Nandi.

## III. OBJECTIVE

The prime objective of this project is to develop a module which can collect data from vehicle sensors like speed, distance covered, battery percentage and expected range. The information collected is used to display ride metrics information onto a display dashboard on the vehicle.

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# Fire Extinguisher Robot

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**Abstract**— The Project is designed to develop a Low Cost fire Extinguisher Robot using Bluetooth technology for remote operation. Bluetooth HC-05 module is used for this purpose. The robotic vehicle is loaded with water tanker and a pump which is controlled over wireless communication to sprinkle water. At the transmitting end using push Bluetooth app, commands are sent to the receiver to control the movement of the robot either to move forward, backward and left or right etc. At the receiving end three motors are interfaced to the microcontroller where two of them are used for the movement of the vehicle and the remaining one to sprinkle the water during the fire. A water tank along with water pump is mounted on the robot body and its operation is automatically detected by the photodiode based (Light Intensity) Fire detecting sensor or MQ3 sensor for smoke detection. The whole operation is controlled by an ATMEGA328 series microcontroller. A motor driver IC, L293D is interfaced to the microcontroller through which the controller drives the motors.

**Keywords**— Low cost, HC-05, ATMEGA328, LM393/MQ3 sensor, L293D

## I. INTRODUCTION

Previously Fire Extinguisher Robots were controlled by using different electronics devices but this reduces the scope of control of Fire Extinguisher robot. However, with the advanced techniques we can build the same robot by using android application to control the actions of the robot. With the help of such robots, fireman as work really decreased and movements of robot are so much effective. By using an android app fireman can detect the fire and can able to extinguish it. At the same time robot can detect the obstacles and can avoid them by using ultrasonic sensors.

Detection of fire along with extinguishment is a detrimental work that risks the health as well as the existence of a flame extinguisher person in the hazard but through utilizing a robot to execute fire detection and extinguishing in a fire-prone area, loss of lives and undesired incidents can be avoided in a considerable number. The day by day progress of advanced technology has made it feasible to develop different types of household and industrial robot and automation. The definition of the robot states that a system with the capability of executing human tasks or behaving in a human-like manner is regarded as robot. Continuous research and developments are going on for obtaining a reliable and effective method which can be enforced to develop a fire Extinguisher robot to detect and extinguish the fire to lessen the risk of injury to victims.

## II. LITERATURE REVIEW

There were many firefighting robots being constructed nowadays using different types of Microcontroller. However, these are just restricted for prototype purposes. There are several reasons for this, some of them are: due to high cost, lack of effectiveness, due to complex construction, due to lack of detection of fire, etc.

- A. Low Cost Bluetooth Controlled fire Extinguisher Robot Using Light Intensity Sensor it is easy to integrate with lighting system such as automatic lighting system.
- B. Fire Fighting Robot Remotely Controlled by Android Application in which major deprivation and absence of important assets can be avoided.
- C. A Novel Fire Extinguishing Robotic Vehicle Controlled by Android Application into this robot they used Touched screen.

## III. OBJECTIVE

Increases the scope of control of fire fighting robot with the help of Bluetooth Technology.

## IV. PROPOSED WORK

Proposed project is designed to build an android application which can control operations of the fire fighting robot. Fireman can send commands to robot through Bluetooth module which is mounted on robot itself. Smart phone has facility of Bluetooth, through that Bluetooth fireman can control the movement of firefighting robot. For fire detection it is using two sensors. One is temperature sensor and second is smoke detector. Fire extinguishing system will be get activated when fire detection system detects fire. Sprinkler will start sprinkling water when it detects fire. At the transmitting end android application is used and at receiving end two motors are interface to microcontroller.

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# Wireless Control of Rockerbogie Mechanism Robot

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**Abstract**— The purpose of this paper is to design a robot which is capable of detecting buried landmines and marking their locations, while enabling the operator to control the robot wirelessly from a distance. The ideas and concepts from the theoretical stages are shaped into the physical hardware components by fabrication of a prototype and then software programs are integrated into the system so as to test and experiment the concepts that had been developed. The designed robot is capable of detecting a buried mine, marking the exact location of the buried mine, and controlling itself from stepping over it and detonating the mine. The detection of the buried mine is done by using metal detectors since most land mines contain metal components.

**Keywords**— Rocker-bogie, Wireless control robot, Stair climbing, Transmit real time video, Detect Landmines

## I. INTRODUCTION

The landmine crisis is globally alarming since there are present 500 million unexploded, buried mines in about 50 countries. Governments are looking into this situation seriously since landmines are claiming the limbs and lives of civilians every day [1]. The purpose of this project is to design a robot which is capable of detecting buried land mines and marking their locations, while enabling the operator to control the robot wirelessly from a distance. A land mine detection robot is needed to be designed to employ in peace support operations and in the clearance of contaminated areas. Also the robot shall be able to detect 50-90% of landmines (Anti-personnel mines) and mark the locations of the mines within a tolerance of 5cm. For the safety of the operator, the designed robot must be able to operate remotely, moreover, must be equipped with wireless data transmitting capabilities [2,3]. Landmines are easy-to-make, cheap and effective weapons that can be deployed easily over large areas to prevent enemy movements. Mines are often laid in groups, called mine fields, and are designed to prevent the enemy from passing through a certain area, or sometimes to force an enemy through a particular area. While more than 350 varieties of mines exist, they can be broken into two categories, namely, anti-personnel mines and anti-tank mines. Anti-personnel mines are designed to kill or injure enemy combatants. They are usually buried 10mm to 40mm beneath the soil and it requires about 9 kg minimum pressures to detonate them. The face diameter of most the anti-personal mines ranges from 5.6cm to 13.3 cm

## II. LITERATURE SURVEY

[1] 'Design and Implementation of a RF Controlled Robotic Environmental Survey Assistant System' by Md. Shamsul Alam, Insan Arafat Jamil, Khizir Mahmud and Najmul Islam published in 2014, focused on use of RF robots for environmental survey which involved data collection and logging and sensors to sense the hazardous compounds in the vicinity.

[2] 'Low Cost Radio frequency Controlled Robot for Environmental Cleaning' by M.Muthiah, Rk. Sathiendran, K.Nirmal published in the year 2015, used RF controlled robot for the cleaning in hazardous areas like Chemical Labs, Radiation Factories, etc. and even in home applications.

[3] 'Robust Stabilization of Wheeled Mobile Robots Moving on Uncertain Uneven Surface' focuses on stability of wheeled mobile robots (WMRs) which is more than legged robots. The control design is carried out for the dynamic model of unicycle, the most common and simplest among WMRs.

The need of such WMRs has been necessity of the age; they can be used in field operations such as for rescue and search applications. By this we can be sure that less human harm is done in rescue operations.

[4] 'Robust Stabilization of Wheeled Mobile Robots Moving on Uncertain Uneven Surface' by Xiaocai Zhu, Guohua Dong and Dewen Hu and Zixing Cai published in 2006, used dynamics of the system to stabilize the robot (WMRs).

From the referred papers we have learned that the range of RF module is sufficient for low key applications, these applications can depend in the various field they are to be used. The components to be used can vary depending on the applications like cleaning purposes, Environmental surveillance, etc.

The accuracy, reliability, and flexibility can be taken in use for the RF robot. All the factors of stability, transmission of signals, cost-efficient robot are satisfied. The use of RF control can be helpful in the long range of activity and can be used efficiently.



# Smart College Campus Portal

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**Abstract:** The Smart College Campus Portal project is aimed at developing an Online Intranet College Management System (CMS) that is of importance to either an educational institution or a college. The main idea behind this project is that due to the covid crisis all colleges were shut and many colleges were not able to carry out the daily operations that they used to perform on the floor. Also, colleges have to rely on third-party ERP systems to carry out operations which may cost the college/institutions. This project is developed by the collaboration of 4 students to help institutions carry out their activities even though college may remain shut. This project focuses on the Teachers, HOD, and students to carry out college activities just by sitting at home at ease. The system is developed by two main technology stacks 1) JDBC 2) Django. This system concludes that the system will be effective even though colleges are closed and follow an online mode of learning or even if they follow the usual way of learning. This system eradicates the use of paper and encourages students to follow digitalization.

**Keywords:** JDBC, ChatBot, Django, Attendance.

## I. INTRODUCTION

ERP management is a web application. It makes use of Android-based mobile phones as well as web services on computer systems. The main goal is to create an application that offers a smart and simple way to carry out many instructional operations, such as providing students with information on grievances, placement events, general notifications, and relevant notices from all departments. Students, Teachers, H.O.D., and principals are the four groups of users that can use the app. Each user class will have its application view tailored to their needs.

The use of the Internet and the World Wide Web has revolutionized the availability of information in the digital world of technology and the user's right to take action on the information received. And computers and electronic devices often influence our lives in more ways than we are likely to be aware of computerized administration, storing data from educational schools, universities, other infinite lists. He reviews the details about a pupil, employee, worker, etc. whether management needs the appropriate information. The administrative labor to achieve the details about all pupils, instructors, etc. is hard to plan.

College management systems are a total solution for the online management of a college, i.e., an improved instrument that helps coordinate the day-to-day operations of colleges.

There is an annual procedure in the new structure for the bulk of the college campus to retain notes and other material. Taking the new framework keen on deliberation. it can be seen that the student has to communicate directly with the office daily, succinct on the needs they intend, and so on. Both these need more time and employment.

The proposed Smart Campus framework using Wireless is a fully automated one. The Smart Campus is both a smartphone application and a web application. It uses Android smartphones and online services on computer systems. The main goal is to establish and provide information about grievances, any placement practices, general notifications, and significant notices about all departments to students.

The main objective of Smart Campus growth is to provide a simple way not only to automate all a college's operations but also to provide the highest authority of the college with the finest information regarding every part of the college.

## II. EXISTING SYSTEM

Since the retrieval is not user-friendly, the new method data is very sluggish and knowledge is not effectively maintained. The use of certain technologies can be nuanced and time-consuming. Such systems must be operated by a professional for the system should be managed and upgraded, which can once again be very expensive.

All report generation calculations are performed manually, so there is a higher risk of errors. Here the faculty has to suffer a lot through the calculation and it can cause a lot of trouble if there is a failure of any paper. Because of exaggerated calculations, this is often time-consuming. There are some miscalculations even after that, which is challenging for the teachers. These calculations also impact the students' grades, which will eventually lead to their percentage. The

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[Dimpal B. Adate](#) , [Pathan Mohd Shafi](#), [Herman Dwi Surjono](#) & [Vinod Kimbahune](#)

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#### Abstract

Data is an essential requirement for a number of approaches that have a requirement for large amounts of data such as PHR or public health records for medical institutions, relevant data for the machine learning prediction algorithms, etc. Therefore, there are data aggregators or vendors that are concerned with the collection management and delivery of data on request. This is a novel






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Conference paper | [First Online: 19 March 2021](#)

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#### Abstract

During the past few years, traffic accidents and congestions have increased enormously. Even in our daily life, we come across many problems caused due to traffic rule violation by some people. Also, when we go through the daily newspaper, we realize that road accidents are one of the major problems nowadays in every city. These problems cause disturbance to the whole system and also




  
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## Proceeding of First Doctoral Symposium on Natural Computing Research pp 339–354

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### Security Enhancement in Route Once and Cross-Connect Many (ROACM) Protocol

[Pathan Mohd. Shafi](#) , [Jagdish Ingale](#), [Abdullah Bahattab](#) & [Vinod Kimbahune](#)

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#### Abstract

Security is very important issue in network communication. The purpose of this paper is analyzing efficient and secure communication in network. The network protocol Route Once and Cross-connect Many (ROACM) is differentiates with the Transmission Control Protocol/Internet Protocol (TCP/IP). This investigation reduces various



# A Step Towards Smart System of Ration Card using Biometric and RFID.

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**Abstract** - Ration card plays a vital role for the household details such as to get household gas cylinder, total no. of family members details and it is mainly used as the proof of address. A very improvised technique is used in this paper which implements smart ration card. The main aim of ration card is providing food grains and other essential items to vulnerable sections of the society at reasonable price and to eradicate inefficiency in the targeting of beneficiaries and the resulting leakage of subsidies which is the main disadvantage of present PDS (Public Distribution System). These objectives can be achieved by implementing smart ration card which will update the database. This will lead to a database which will avoid duplicate entries and fake cards which will help to avoid illegal and bogus claims and fraud in distribution of ration.

**Key Words:** RFID, Biometric, IOT, Ghost Cards, PDS

## 1. INTRODUCTION

Ration card is an official document allowing the holder to get ration such as grains, fuel, or other goods issued by the Government of India. They are mainly used for purchasing foodstuffs like (wheat, rice, jowar, kerosene) etc from PDS (Public Distribution System) which are the ration Distribution systems. These ration cards are beneficial for the people below poverty line for getting grains at very lower rate. Government provides grains at subsidized rates to the people below poverty line.

But these PDS owners are responsible for many malpractices like showing ghost cards i.e fake ration cards and taking more amount of grains from government and selling it in the open market for gaining more profit. So, the objective of this project is to stop the corruption by avoiding the access of ration card to the fake people. The RFID tag is scanned on the RFID reader at the PDS and for the added security, Fingerprint biometric is added so that only the valid person can be able to take the advantage of the ration quota allotted to them.

An Android application is also developed which will display the quota of grain allotted to that specific family. The application contains the login and registration where a new family can register and also update their information. The app will contain the monthly quota of grains allotted to the specific family, the allotted quota and the received quota of grains. After receiving the grains the app will update the price and quantity of the grains allotted to that family.

## 2. LITERATURE SURVEY

In [1], this paper introduces smart ration card using Radio Frequency Identification (RFID) technique to prevent the ration forgery. In this system, a RFID tag is used that carries the family member details and the customer needs to show this tag to the RFID reader. The micro controller connected to the reader will check for the user authentication. If the user is found authentic then the quantity of ration to be given to the customer according to the total number of family members will be displayed on display device. This system uses GSM Technology which is used to send information about delivered ration directly to the government without manual feeding.

In [2], an automated system is implemented to overcome the drawbacks that exist in the present distribution system. Ration cards are replaced with the RFID (Radio Frequency Identification) tags in which all the required information (name, contact number, aadhar number, etc.) are stored. Once when materials are given to the shops by government, through GSM (Global System for Mobile) every customer is informed to collect the ration. Customer is asked to show the tag and then to enter the password. After the microcontroller identifies the authorized person, he/she is asked to enter the ration material and the quantity of their need. The government receives message with name and aadhar number of the person after he/she gets the ration material they have already entered. This paper also proposes the implementation of additional features namely, tampering detection in case of theft as well as fire detection while fire accidents occur.

In [3], this paper proposes automation in ration distribution using smart card based on Aadhar card technology. In this system, a prototype model based on ATM machine is proposed. Using this technology, secure and interactive approach for automation for ration distribution is achieved. Aadhar card contains all related information such as name, contact number, address, bank account details, biometric information and demographic data. Customer details are stored in the central data base which is provided by the government authority. RFID contains unique Aadhar identification number of all the family members, card holder type APL or BPL which is used for user authentication to buy their ration. OTP and SMS will

# ONLINE VOTING SYSTEM USING FACE RECOGNITION AND OTP(ONE-TIME PASSWORD)

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**Abstract** - The basic idea of this system is to create an Online Voting System that will help to suppress deceive of the manual voting system and also the prior versions of online voting by camera for Face Recognition and OTP generation. We are also implementing location free voting system to the voters for whom it is not possible to come at the voting location (hometown). Here we propose a system that includes multiple layers of verification to ensure the reliability of the device which includes face verification and then OTP verification with validation data. Each voter can access to the system only when being recognized and checked with the given database of enlist voters. Once the corresponding face is matched with the information provided, the voter will be allowed to proceed for choosing their preferred candidate from the panel.

**Key Words:** Image Processing, Python, Voting System, Face Recognition, MySQL, OTP

## 1. INTRODUCTION

As per the records of TOI 24 Jan, 2009 11 lakhs fake votes were observed in Delhi. Then according to India News June 2013 : 30000 illegal voters were found in election commission under Sheila Dikshit constituency. Another news which was alleged by LJP(LokJanshakti Party) Chief, Ram Vilas Paswan saying that Bihar election were having 30% fake voter- cards. Election involves both public or private vote which depends on the position. Local, state, and federal governments are some of the most important positions. In paper based on election, Voters cast their votes by simply depositing their ballots in sealed boxes distributed across the electoral circuits around a given country. After ending of election period the boxes which contains of ballot control unit are opened and votes are counted manually in presence of the certified officials appointed by election commission. So it is a time consuming process and also requires a lot of resources to conduct voting process. In this paper we have proposed online voting system to cast the vote using face recognition and OTP. The information about the OTP and Face is passed to the server unit for the further verification. Then the server checks for the data from the database and compares that data which is already existing in database. If the data matches with the already stored information, the person is allowed to poll the vote. If not, a message is displayed on the screen and therefore the person

is not allowed to poll the vote. For voting representatives are appointed by electorates. In current scenario voter needs to show his/her voter ID card to cast the vote on the booth. So this process is time consuming as the voter ID card needs to be get verified by the officials. Thus to speed up the voting process and avoid such type of problems, we have proposed the new system.

## 1.1 Problem Statement

Even though our Country has taken steps towards Digitalization of India, considering the progress of Voting System it still has some flaws. Registration of Votes is being possible only if people go to polling booths for the current system. During the time of voting, voter's name is listed in the list of his/her respective area. They cannot vote outside the vicinity of the address mentioned in the voting card. So people who are migrated to other places cannot cast the vote physically. The recent pandemic situation of Corona Virus shows us the risk of this system. This can lead to failure of social distancing during voting process, as the voter needs to be physically present for casting the vote.

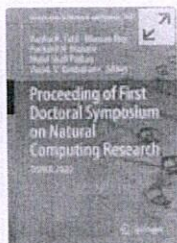
## 1.2 Literature Survey

### 1) Decentralized E-Voting Portal Using Blockchain

This paper represents frameworks of blockchain for the E-voting system. This implementation can be used for small scale elections such as board rooms or inside corporate houses elections. Smart contract from Ethereum is used for this implementation. The idea behind this implementation is to combine the technology of blockchain with the homomorphic encryption and secret sharing schemes for the decentralized voting applications safe from trusted third party. It gives the public and transparency voting process which protects the anonymity of voter's identity and the privacy of data transmission and verification of ballots during billing phase.

### Advantages:


- It increases transparency of the voting and protects the uncertainty of identity of voter.



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## An Adaptive Algorithm for Lexical Ambiguity in Word Sense Disambiguation

[Chandrakant D. Kokane](#) , [Sachin D. Babar](#) & [Parikshit N. Mahalle](#)

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**226** Accesses | **2** Citations

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### Abstract

The lexical ambiguity in word sense disambiguation is a crucial problem in the fields of machine translation and information retrieval. The lexical ambiguity causes because of polysemy words in a natural language understanding. The polysemy words may confuse the machine while processing user inputs. In machine translation, the polysemy

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## Word Sense Disambiguation: A Supervised Semantic Complex Network Approach

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**Abstract**-Lexical ambiguity in machine translation and information retrieval is the challenge. Lexical words where the word has multiple meanings. In Natural Language Processing before processing human of ambiguous commands should be done. The existing disambiguation methodologies disambiguate at context information. The main identified problem is what if an ambiguous sentence doesn't have enough context information. The proposed model elaborates an adaptive sentence semantic similarity based complex network approach and resolving it using semantic information. The discussed model represents the sentences of ambiguous weighted complex network is constructed with respect to semantic similarities. The complex network of ambiguous sentences having lack of context information. The main goal of this model is to provide disambiguation of the paragraph or large document.

**Keywords:** Lexical ambiguity, Semantic Similarity, Complex network, Sense disambiguation.

### 1. Introduction

Word Sense Disambiguation(WSD) is the critical problem in Natural Language Processing(NLP). The WSD is mainly introduced by the polysemous word also known as ambiguous word. The ambiguous word has the same spelling and pronunciation but different sense values. The ambiguous words are disambiguated with available context information. A lot of research is done with word embedding and machine learning based classifiers for WSD. The important challenge is disambiguating ambiguous words without context information in large documents. A complex network is constructed by the S-3 model. The sense annotated data is further used for disambiguation. While processing large documents, it is very important to store the

represented with vertex and the weight value is considered represents the closest ambiguous sentence so that the sentence is considered proposed adaptive model considers the context information to discover its correct sense. Without context information (vertex) of the ambiguous words disambiguation. The supervised model is implemented with intelligent manual sense tagged data. The proposed model uses a supervised learning technique for representing

## Requirement Analysis For Business Process Re-Engineering With C Intelligence

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**Abstract:** There are enormous software applications which are developed for the use of the software user. The software user may be categorized as public users who use online services through the internet and private users who use the specific software inside a specific organization only. The private organizations, Educational institutions, Health care centers and other government organizations have a specific requirement on the basis of which the software and management framework has to be designed. Organization specific software are developed for the service users by the software development companies and where under maintenance team in the timely manner. At times, when these registered users are in need of altering the software which are used, then the business process reengineering is required. Business process reengineering plays a vital role in the maintainability and the sustainability of the software on the user requirement. To create an effective Business process Re-engineering Framework, stakeholder requirements are considered as the prerequisite. Based on the requirements, the stakeholders requirements has to be initially preprocessed and then they would be re-engineering, the stakeholders requirements has to be initially preprocessed to be grouped and prioritized with the ranking of the requirement modules that has to be done. The risk assessment has to be done to estimate the critical conditions or the changes that are required for re-engineering and the requirements will be clustered for effective execution.

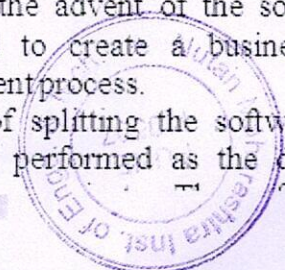
**Keywords:** Business Process Reengineering, Computer Intelligence, E-Commerce, Re

### 1 Introduction

Business process is the collection of related tasks that has to be performed to produce a service or a product for a particular customer. The business process activities are implemented in various forms of organization like business agencies, private and public organizations. The business process is the set of tasks that has to be performed to create a product. These activities are generally described in terms of description and the product requirement. Due to the advent of the software automation, the requirements can be analyzed and implemented to create a business product. Business process development is analogous to the software development process.

Software development process is the technique of splitting the software development process into modules, where each and every module will be performed as the distinct phase.

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## DESIGN AND FABRICATION OF GEAR DEBURRING MACHINE

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**Abstract** - Gears are the machine element that transmits the rotary motion and power by successive engagements of teeth on their periphery. The Gears have been used for more than 3000 years and they play a vital role in running small and big types of machinery. Although for smooth functioning, gears should be well manufactured which include their smooth finish and long life running. The gears are manufactured by various processes and each process requires precision and accuracy as an integral part. After welding (or cutting) or manufacturing of gears, the left-over part is known as a burr. It is the unwanted part (or byproduct) that is to be removed. But the Burr is also great for protecting the weld while it cools. After Burr did its job it should be removed. There are several ways to remove off the burr, but the common method past many years was with the chipping hammer. But using a chipping hammer which is pencil like structure, it could damage the surface by leaving some marks. The use of a chipping hammer is good when it will be used with a wire brush and they are gently good. Hence, there is a need for a special purpose machine to remove it, for the smooth functioning of the component.

**Key Words:** Deburring machine, Burr, Gears, Motor, Gearbox, etc.

### 1. INTRODUCTION

Before studying the design & fabrication of gear deburring machines. Firstly, we should understand why Burr is removed after welding (or cutting) or manufacturing of Gears? What will happen if we didn't deburr the gear properly? How it is important to remove the unwanted part i.e. Burr after welding (or cutting) or manufacturing. As we know that burr is the byproduct which should be removed. Before all this we have to understand what actually burr is. And what will be the results of Deburring Machine.

#### 1.1 Burr:

- These are the uncut / unwanted material which will remain on the workpiece after being welded or manufactured.

- A burr is a material which accumulates on the surface of workpiece during the manufacturing or welding (or cutting).
- It is the material (tiny or big) depends on types of welding (or cutting) or manufacturing process which remains on the job and which creates the problems in many situations for example, Accuracy, Precision of jobs, Measurement of jobs, Functionality of jobs, Life of the component, etc.

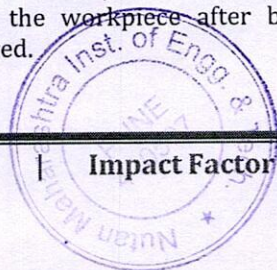
#### 1.2 Why we need to remove burr?

There are many reasons to remove Burr which are as follows:

- If the burrs are not removed, the size of the part cannot be measured accurately. Therefore, it is imperative to remove the burrs before the measurements are taken.
- After welding or cutting, the Burr doesn't help to protect the metals. And hence, Burr is a waste material.
- It should be removed to get the ability to inspect the quality of weld area.
- Workpiece appearance should be aesthetics or ergonomically for that we have to remove burr.
- Clean and clear surface for coating such as paint or oil.

#### 1.3 Main Functions of Weld Burr:

- It protects the high-temperature metal from atmospheric contaminants which may weaken the weld joint or weld area.
- It can also be globules of the molten metal that is expelled from the joint after the welding and then it may re-solidify on the metal surface.
- It protects the weld from oxidation and slows down the rate at which the welding cools down.
- Burrs are also used as it helps to prevent the brittleness of the metal.



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## CFD Simulation and Experimental Results Validation of Slurry Erosion Wear using Slurry Pot Test Rig

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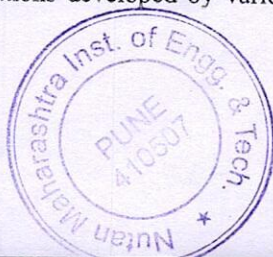
### Abstract


Erosion wear is a severe issue in different industrial applications results in economic costs and operational failure. In most of the industry pipelines are used to handle the slurry during industrial process, the slurry handling pipeline is failure due to erosion wear. The slurry pot test rig is developed and fabricated for investigating the erosion wear rate of different material and solid particles used in the slurry pipeline with various working conditions. The various influencing parameters such as solid particle flow velocity, impact angle, solid particle size, and concentration are responsible for the rate of material loss and erosion wear mechanisms. The present study is based on experimental work and its validation of results of slurry erosion wear for slurry handling pipeline using slurry pot test rig and CFD simulation. For experimentation, mild steel is used as pipeline material and coal bottom ash is used as solid particles for simulating slurry handling pipeline use in a thermal power plant. The experimentation is performed on the slurry pot test rig. The computational fluid dynamics (CFD) tool is used to predict and simulate the experimental results of the slurry pot test rig. The simulation results compared with experimental results and check the percentage of errors with both the results. The simulation results show a similar kind of trend for erosion wear behavior of mild steel as per the experimental results. Simulation results show the average error up to  $\pm 21\%$  variation with the experimental result. The simulation results give the position of erosion wear over the sample surface.

**Keywords:** Slurry pot, Slurry erosion, Prediction, Validation, CFD simulation

### Introduction

The thermal power plant, oil refinery, chemical industry, the hydraulic power plant has used the various size of pipelines for the transfer of liquid from one place to another place. According to applications of these industries some solid particles are available or mixed with flowing liquid. Due to the repetitive impact of solid particles present in flowing liquid as a result in a continuously removed pipeline material from the inner side of the pipeline. Such types of removal of material called as slurry erosion wear or solid particle erosion wear. The slurry erosion wear is the most common problem for such process industries. From last decade, slurry erosion problem in the thermal power plant has drawn major attention amongst researchers, because coal ash (fly/bottom) particles lead to savvier damage on many components of coal ash transport or disposed systems such as pipelines, pumps (casing/Impeller), flow control valve and elbows. This damage can start leakages or sudden failure of the component and can result in loss of production time and expensive repairs. Therefore, prediction of erosion wear rate and location identification is an essential task for avoiding failure and damage of components. There are a number of parameters responsible to erosion wear out of that solid particle size, concentration, impact velocity and impact angle play a significant role for material removal in slurry erosion wear. The variety of equations developed by various researchers either empirical or purely theoretical based reported in



  
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## REVIEW ON DESIGN AND MANUFACTURING OF E-BICYCLE SYSTEM

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### ABSTRACT

In this review paper attempt is made to find out solution for small distance mobility. Electric bicycle is a pollution free solution for the better world. E-bicycle comprises the features like compactness, electrically powered comfortable riding experience, light weight vehicle. E-bicycle is the most versatile short mobility feature vehicle considering its advantages. In this paper we studied different components of electric bicycle and performance improvement for electric bicycle.

**Keywords :** Compactness, Small distance mobility, Electric bicycle, Light weight vehicle.

### I. INTRODUCTION

As we know that in today's date petrol bikes are not affordable for travelling small distance because of its increasing prices so electric bicycle is the alternative for it. It uses an equivalent design, geometries and components as the other bicycle but also include another motor. This is charged by a rechargeable battery, which gives cyclist an extra power and ultimately provides a effortless cycling experience. It is energy efficient and emission free transportation which also has physical and health benefits. So by this reasons electric bicycle is more suitable alternative of bike for small distance travelling. Table 1 shows electric bicycle advantages over bike.

**Table 1 :** Difference between E-bicycle and bike

Sr. No.	Parameters	Electric Bicycle	Bike
1	Pollution	Zero pollution	Pollution in large scale
2	Maintenance	Maintenance free drive	Engine maintenance required
3	License	No license required	License required
4	Noise	Noise free riding	Noise pollution
5	Fuel cost	Fuel not required	Required

### II. LITERATURE REVIEW

A) Srivatsa Raghunath - Hardware design considerations for an E- Bicycle using a BLDC motor.

**Table 2 :** Selection of motor

Sr.No	Type	Advantages	Limitations	Applications	Drive
1	Stepper DC	High holding Torque.	Slow speed required a controller	Positioning in printers	Multiphase DC
2	BLDC (Brushless)	Long lifespan, High efficiency.	High initial cost requires a controller	CD/DVD players	Multiphase DC
3	BLDC(Brushed)	Low initial cost, Simple speed control.	High maintenance, Short lifespan	Toys	Direct

Brushless DC (BLDC) motor may be a sort of electric motor, where magnetic fields generated by both stator and rotor have an equivalent frequency. The BLDC motor features a longer life because no brushes are needed. Aside from that, it's a high starting torque, high no-load speed and little energy losses. Three-phase motors are

## Gas metal arc welding process parameter optimization for AA7075 T6

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**Abstract.** Aluminium alloy 7075 T6 weld joints having size of plates 125 mm × 100 mm × 10 mm experimented to investigate the effects of process input parameters on the thermal, mechanical properties of GMAW. The process input parameters like current (A), heat flux (Q), flow rate of gas (G), speed of welding (S), wire feed rate (F) & shielding gas are affecting the thermal, metallurgical & mechanical properties of weldment. This experimental study aims at developing mathematical models for bead height (HB), bead width (WB) and bead penetration (PB) and investigating the effects of four process parameters. This experimental analysis aims at temperature study for selection of process parameter & prediction of the bead geometry. The heat flows during welding process controls the grain size & material properties. The temperature spread is vital in affecting characteristic of weld joint. Transient thermal analysis gives temperature & residual stress distribution at varied mode of heat transfer phases.

**Keywords:** Aluminium Alloy 7075 T6, Gas Metal Arc Welding (GMAW), Transient thermal analysis, microstructure.

### 1. Introduction & Literature Review

Two different components are connected together by melting & then further solidification of nearby portion in fusion welding process. The size of fusion and affects on the weldment properties is controls by flow of heat in welding process. The distribution of the temperature, composition of chemicals & geometry of weld bead of the weld joints affects on the thermal, metallurgical and mechanical properties of weldment. Now a day the automotive industries have been using light material like aluminum than that of conventional material like steel. The aluminum alloy weld joint is influence by the following physical properties.

- Temperature range of solidification.
- Thermal conductivity
- Thermal expansion coefficients
- Oxide formation at surface

The advantages of using GMAW for joining of aluminium alloy 7075 T6 is of high efficiency, better quality of weld, less manufacturing cost, automation in manufacturing, less production time than that of traditional joining processes. Nowadays GMAW process is used very widely in various applications like Structure assembly, automotive industries, piping industry, in construction machineries, ships etc. Almost all commercial metals like aluminium, carbon steel, nickel, titanium alloy, carbon steel, low and high alloy steel are joined by GMAW process. To achieve high quality weld the proper selection of welding parameter, proper handling of welding equipment, welding knowledge and welding technology plays a very important role, otherwise it leads to defects in the welding.

In the past, Aluminium alloy 7075 has been the standard workhorse 7XXX series alloy within the

