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BEST PRACTICE-I

1. Title of the Practice:
Bodana-Sadhana-Nipuna-Programme **(BSNP)**

2. Objective:
Narasaraopeta Engineering College believes in giving students every opportunity to go beyond the regular curriculum, broaden their learning experiences and expand their future options. Within the four-year graduation programme, the institution offers all students an additional learning opportunity to develop their practical laboratory abilities. It encourages students to pursue careers in research and development. They learn to use their knowledge and talents to identify and address societal and industrial problems. They are attempting to incubate the ideas and later turn those into prototypes further moulding them into commercial models that will lead to the development of entrepreneurship.

3. The context:
Innovation and creativity are critical characteristics for the creation of cutting-edge technologies which can tackle the difficulties of globalization. The transformation of Science, Engineering, and Technology has shifted the focus of a student's success from theoretical to applied knowledge. These factors encourage technical institutes to broaden their teaching and learning processes to include more practical courses and activities. It is critical to encourage engineering graduates to pursue careers in research and development in order to boost the country's economic development. It is necessary to place a greater emphasis on project-based and situation-based learning, because it allows them to think out of the box and use their imagination to its full potential. Project and model making begins with the selection of a topic from a field of interest and continues with the development of creative solutions to numerous project-related problems and other technical hurdles. Project and model making constantly improves the existing system, allowing graduates to think socially while maintaining technical altitude and ideas.

4. The Practice:
The Institute provides a robust infrastructure across its campus for creating high-quality Models that are up to date. For skill development programmes among teachers and students, the college has MOUs with many reputed national and international organisations such as AWS Academy, Microchip academic programme, Blueprism University, Celonis, Juniper Networks, Paloalto Cyber Security academy, Cloud and Automation academy through EduSkills, Microsoft and Redhat Academy, Dassault Systems- 3D Experience, Applied Robotic Control Lab in association with European Centre for Mechatronics-Germany, Embedded Systems and Robotics Lab under E-Yantra initiative by IIT Bombay . The institute maintains a partnership with Bennet University through APSSDC to provide students with additional training and internship opportunities. Many training programmes for faculty are conducted by the ICT Academy in partnership with the institute. Students are offered mini projects from the second year onwards to build or fabricate unique technological models and this is done under the able guidance of the senior academicians. The college hosts idea-churning sessions with industry professionals (Global Business Incubator) and alumni entrepreneurs. Students are encouraged to attend summer projects / internships in the industries/prestigious academic institutions to acquire practical knowledge.
Faculty encourages students to go beyond the syllabus in every laboratory course including Virtual Labs. Students are guided to identify day to day problems encountered by society and are motivated to find enabling solutions through their projects. The instructors and students work together to enhance their

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knowledge and skills and it is one of the most remarkable aspects of this technique. The professors assist and guide students in developing unique models. The students are encouraged to work in collaboration with the faculty and publish their research work in reputed journals and international conferences. The institute encourages students to join professional student chapters such as IETE, ISTE, IEEE, IEI(I), and CSI. Various events are held under the auspices of these organizations.

The departmental research groups assist students in undertaking mini/major projects to develop working models. College incubation center is established with the necessary facilities. Financially viable Projects are supported for fabrication and testing. There is a provision in the budget proposal for financial support for model making, and the college reimburses 50% of the model cost. A team of faculty members reviews all the completed projects.

5. Evidences

Empowered by spirit of innovation and commitment to societal progress, our students and faculty collaborate seamlessly to tackle real-world challenges. Our students, spearheaded by the unwavering support of their professors, embarked on a project to design and fabricate an electric vehicle.

Their expertise extended to 3D printing, evident in their meticulously crafted models of a rack and pinion steering mechanism, a cam and follower mechanism, a radial engine and various tools and components. Beyond their academic pursuits, our students actively engage in industry-driven competitions, such as Microsoft AI challenge and Hackathons, where they consistently shine, earning accolades and job opportunities that reflect their exceptional skills and boundless potential. Our students' innovative spirit is evident in their diverse range of projects. From developing an IoT-based vehicle accident alerting system to designing a 3D-printed prosthetic hand and a multi-mode robotic car, they have demonstrated a remarkable ability to transform theoretical concepts into tangible solutions. Their passion for cutting-edge technologies is further showcased by their work on deep fake detection, face mask recognition, and bone fracture detection using machine learning.

Beyond these projects, the students' commitment to hands-on learning is exemplified by their involvement in a variety of practical endeavors. They have explored self-healing concrete, wine quality prediction, sign language detection, road accident risk assessment, HVAC system development, drowsiness detection, linear actuator design, parking management, mobility scooter prototyping, color code sensing, and leakage detection in oil and gas industries. Through these projects, they have seamlessly integrated classroom knowledge with real-world challenges, showcasing their versatility and dedication to problem-solving.

6. Problems Encountered

Learning styles and retention differ widely among students, posing a challenge to classroom deliverables within the given limited time. In advanced fields, there is a lack of expertise. Better departmental collaboration is required, which will lead to the development of interdisciplinary models.

Resources Required

It is necessary to obtain more modern tools and equipment. More training for both faculty and students by Industry experts is required. Industry interaction has to be improved. Paid Internships are to be enhanced. Industry Live Projects are to be exposed to the students. While revising the curriculum, a full semester may be allotted for project/training at the onsite industry.

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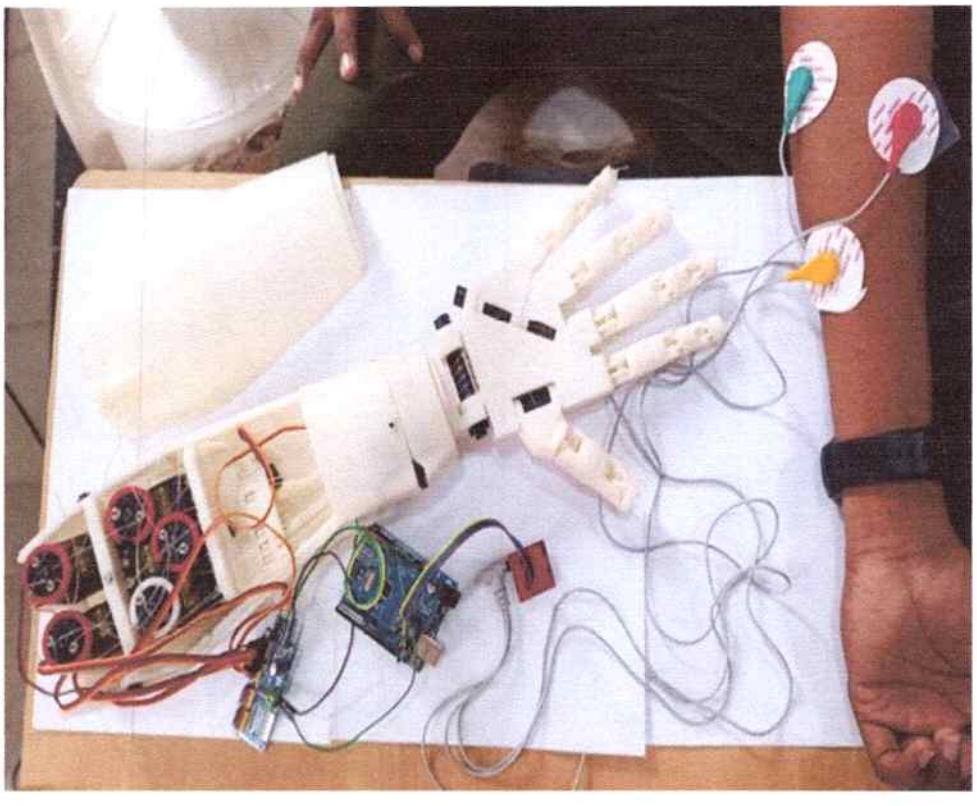
Design And Fabrication of Dexterity of A Human Hand By Using 3d Printing



This project focuses on the design and fabrication of a human like robotic arm utilizing 3D printed components, resistors, servomotors, electromyography sensor, batteries, Arduino microcontroller, and jumper cables. The primary objective is to create an innovative and cost-effective solution for achieving lifelike movements, resembling the dexterity of a human arm.

The robotic arm is constructed using 3D-printed material called ABS, ensuring a lightweight and customizable structure. Servomotors are strategically integrated to mimic the joint movements of the human arm, enabling precise and coordinated motions. The Arduino microcontroller serves as the central processing unit, executing a programmed sequence of movements to control the arm's articulation.

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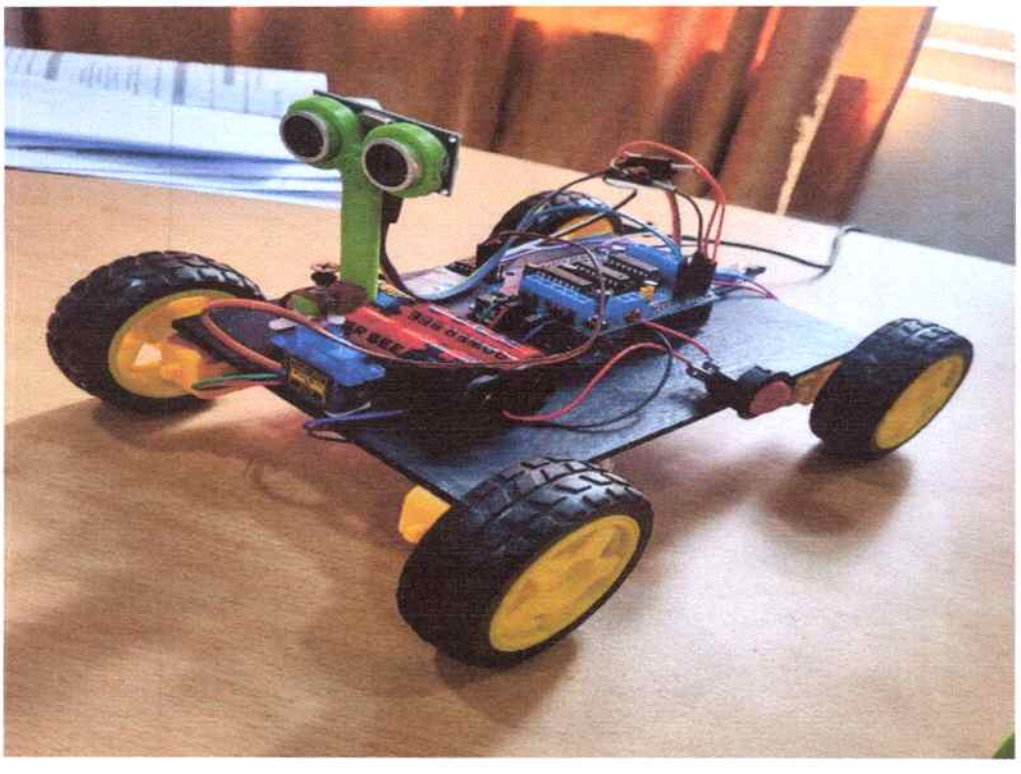
Design and Fabrication of Multi-Mode Robotic Car



This Project introduces a multi-mode robotic car designed to offer diverse control options and obstacle avoidance capabilities. The robotic car operates in three primary modes: manual, gesture, and voice control, catering to users' preferences and interaction styles.

The Multi-Mode Robotic Car project integrates manual, gesture, and voice control modes for versatile operation. "Manual control" via Bluetooth allows remote manipulation using commands like forward, backward, left, and right." Gesture control" utilizes a servo-controlled ultrasonic sensor to interpret hand gestures for steering and motion. "Voice control" enables hands-free operation with voice recognition technology understanding commands for directional movement. Additionally, "obstacle avoidance" mode employs ultrasonic and infrared sensors to autonomously adjust the car's path, ensuring safe navigation in dynamic environments

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Design and Fabrication of Foldable Mobility Scooter

The project seeks to provide a compact, foldable scooter as a practical, eco-friendly alternative, enhancing personal mobility and contributing to a more sustainable urban environment.

The project encompasses detailed research, innovative design considerations, material selection, manufacturing techniques, and rigorous testing to ensure the scooter's functionality, safety, and market viability.

The project aims to culminate in a foldable mobility scooter that not only meets technical specifications but also aligns with user needs, safety standards, and market demands.

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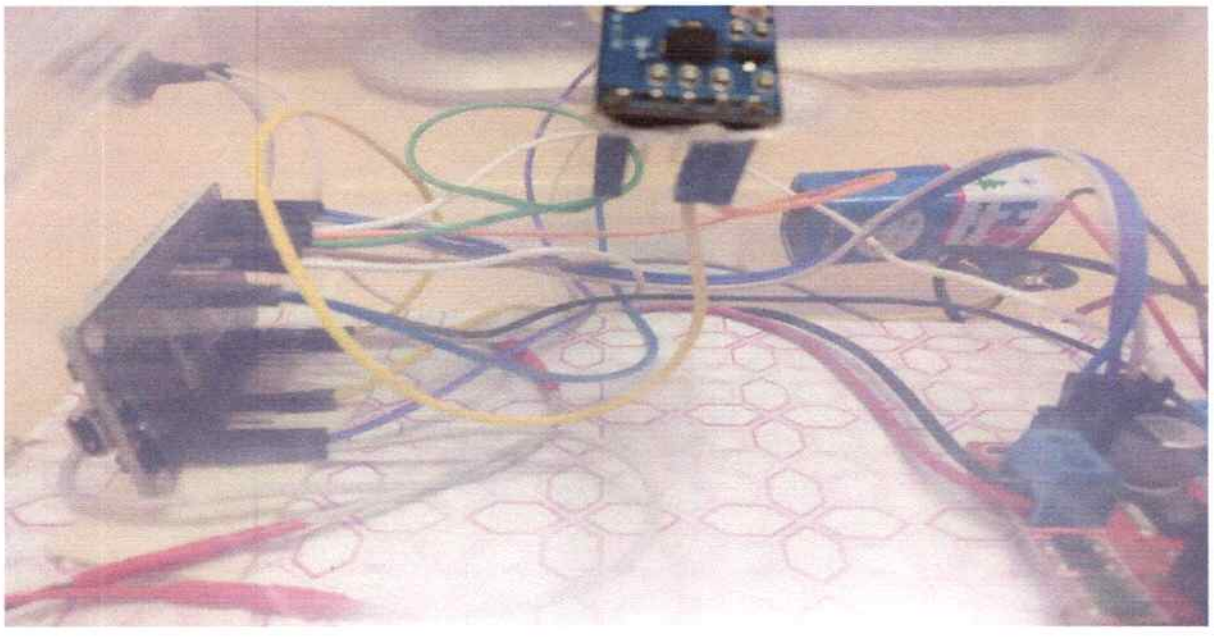
IoT Based Vehicle Accident Alerting System



Transportation has great importance in our daily life and its development has made many of our chores much easy. with an increase in population, there is an increase in the number of accidents that happen every minute In this country a lot of precious lives are being lost in daily basis because of Road accidents .

These road accidents are unpredictable. In most of the cases, there is the unavailability of emergency services which lack in providing the first aid and timely service which can lead to loss of life by some minutes. Hence, there is a need to develop a system that caters to all these problems and can effectively function to overcome the delay time caused by the medical vehicles. The purpose of this paper is to introduce a framework using IoT, which helps in detecting car accidents and notifying them immediately. This can be achieved by integrating smart sensors with a microcontroller within the car that can trigger at the time of an accident.

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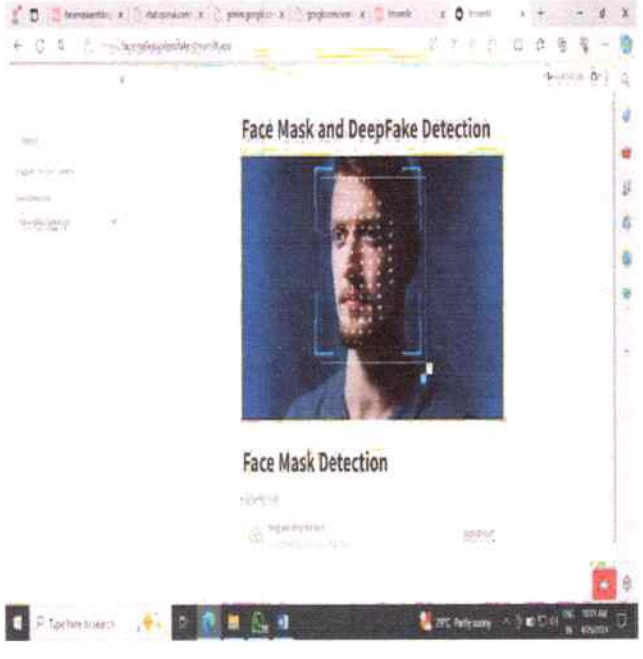
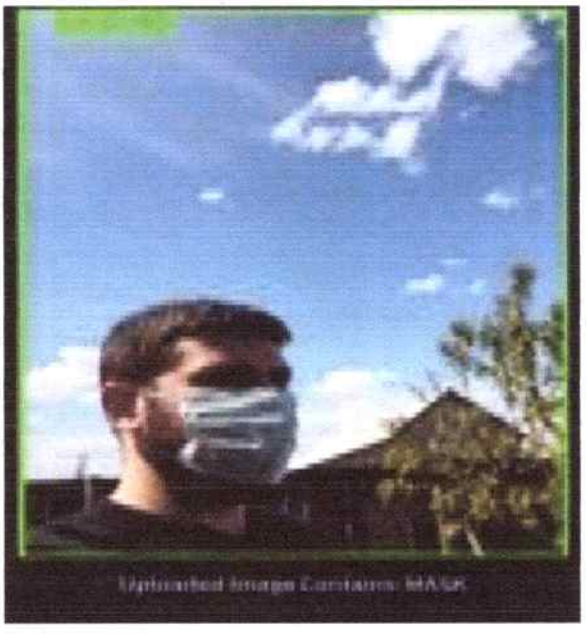
A Deep Dive into Deep fake detection and Face mask Recognition using Deep Learning

With the emergence of the COVID-19 pandemic, wearing a mask has become an important preventive measure to prevent the spread of the disease. Automatic mask recognition plays an important role in enforcing the mask-wearing policy in public places. This article introduces the mask recognition process by focusing on advances in deep learning techniques. We discuss issues related to face mask testing, including differences in mask type, fit, and degree of occlusion. Various deep learning methods such as convolutional neural networks (CNNs) and hybrid models have been investigated to understand their effectiveness in mask detection and classification. We also review the literature and prioritization techniques required for training mask recognition models. We also discuss deployment scenarios that include real-time applications in monitoring and access management. Through this comprehensive review, we aim to learn about the state-of-the-art in face mask analysis and encourage the development of the technology to improve public health during and after the pandemic."





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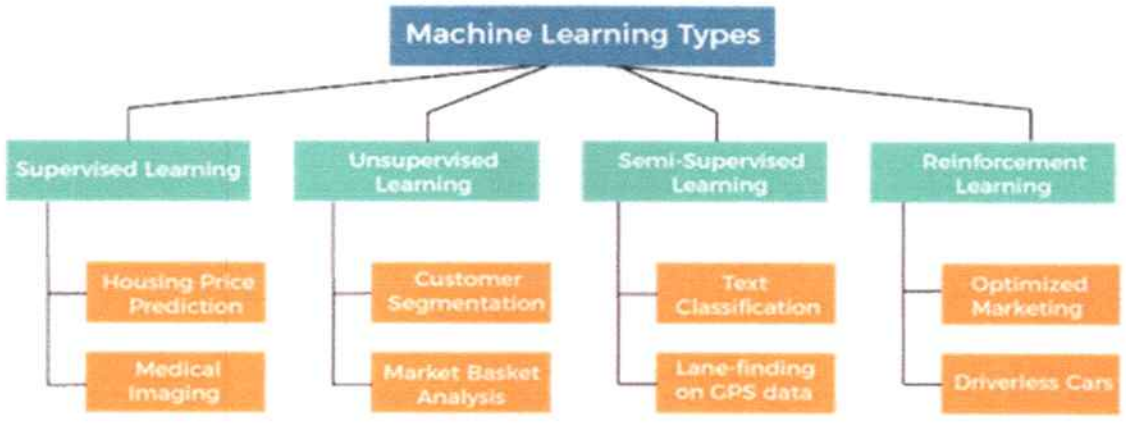
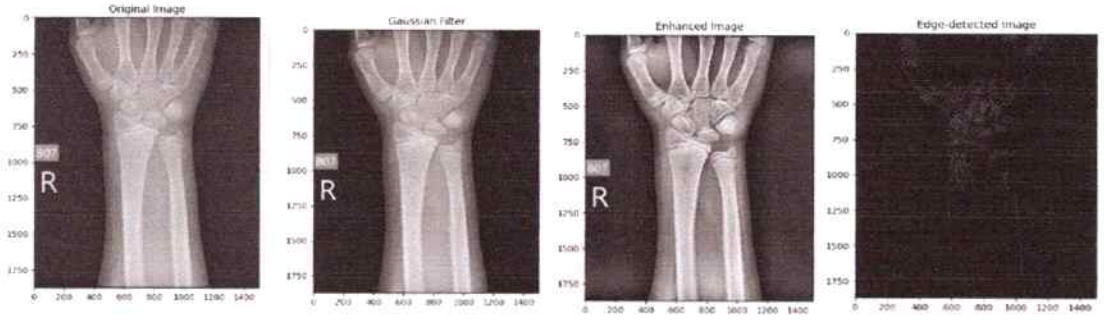
Bone Fracture Detection Using Machine Learning

In today's interconnected world, computers play a pivotal role across diverse domains, revolutionizing aspects such as banking, online commerce, communication, education, research, and healthcare. To enhance medical practices and patient care, innovative technological solutions have emerged. Traditional X-ray scanners often produce indistinct images, posing a risk of misdiagnosis for bone fractures. A comprehensive approach that includes steps like pre-processing the x-ray image, bone edge finding, feature extraction, and machine learning classifiers has been designed to handle this difficulty. The algorithms accuracy evaluations range from 0.62 to 0.94. Remarkably, SVM stands out with the highest accuracy, surpassing most comparable studies. This statistical finding underscores the potential of SVM in fracture detection, reflecting advancements in medical imaging analysis.





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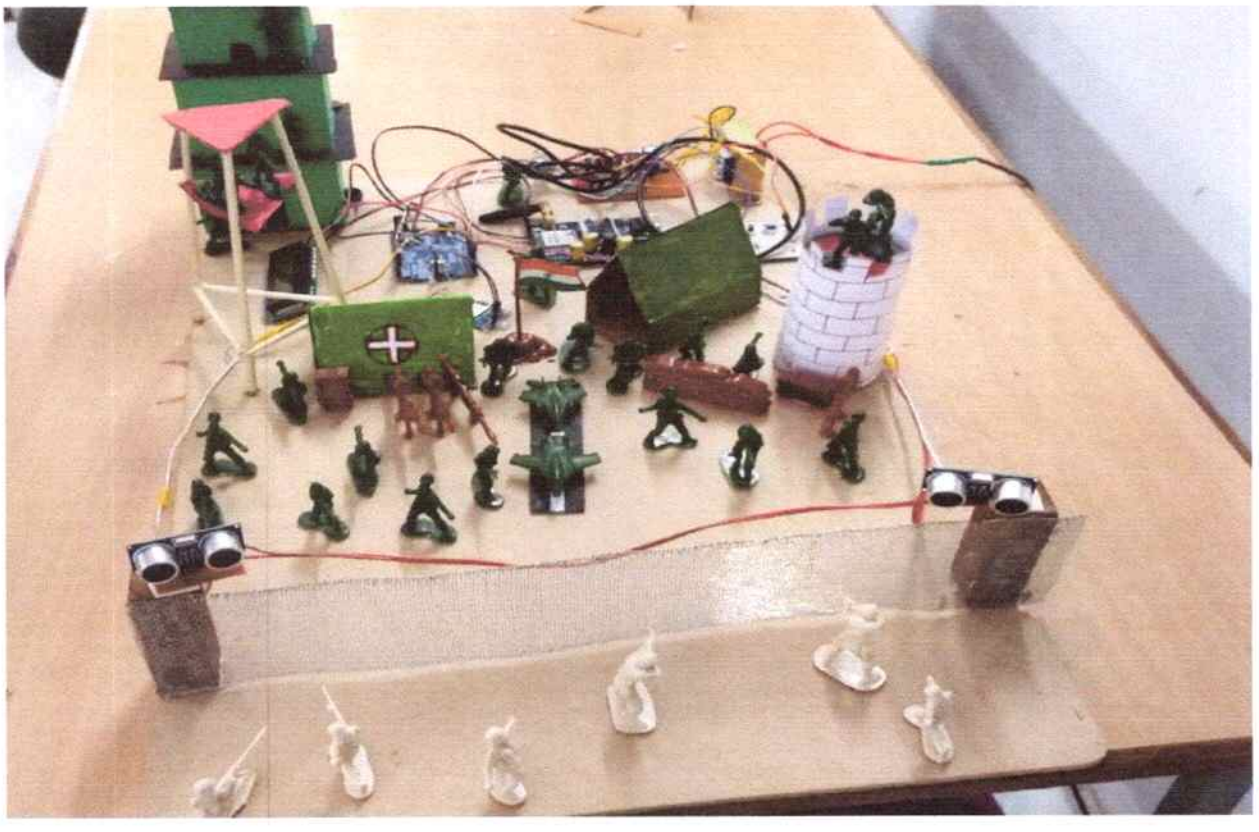
IoT Based Advanced Security System in Military for Identification of Trespassers using Ultrasonic Radar

The primary purpose of our assignment is to offer security to armed force base. The point of convergence is about the PIR sensor, ultrasonic sensor, and unmanned wanderer. The PIR sensors which perceives the general movement of individuals in the unapproved region are set on the limit dividers of the base. After the recognizable proof of the human/object activity, the accompanying stage is to find the zone approached by the individual using the Ultrasonic sensor based radar system which will tell the point of separation of the individual's way to deal with the base and a short time later make a move over them by using the unmanned wanderer which wil follow the individual and give a live criticism through a video and the wanderer will be furnished with a missile launcher to help safeguard the base in extraordinary case. this end eavour explanations behind security is to ensure our home and our family. Security framework shields the individuals is that simply like the occupants of our country, we should empower our military capacity to refresh the advancement used for confirmation of the base and the people in the base. As a rule, one of the primary from our family from thieves and interlopers and keeps us spare. By introducing different security frameworks, we will have an alleviation that we are ensured.



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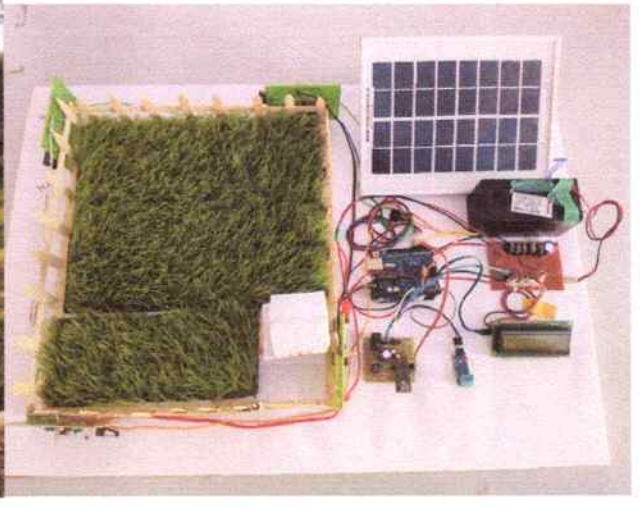
Monitoring the Movements of Wild Animals and Alert System Using IoT for Smart Agriculture Protection

Animal attacks on farmers land are common in nowadays due to the unavailability of any detection system. A proper detection system could help preserve crops. Additionally, farmers crops are destroyed due to frequent interference by animals. Crops and paddy fields cannot always be fenced, so the possibility of crops being eaten away by cows and goats is very much present. This could result in huge wastage of crops produced by the farmers. To make the best use of advanced technology, this system helps keep such animals away from farmlands. Hence, we created a device that might be very helpful for farmers; it boosts production, prevents crop loss, and safeguards the property from intruders. Farm crops are frequently destroyed by neighborhood animals including buffalo, cows, goats, birds, etc. For the farmers, this results in enormous losses. Farmers cannot block entire fields or remain on the field all day to secure them. Hence, we suggest a mechanism for automatically protecting crops from animals. This system is microcontroller-based and uses microcontrollers from the Arduino family. These IR sensors are used by this system to identify approaching wild animals close to the field. The sensor instructs the microcontroller to operate in this situation. The microcontroller now plays an alarm or buzzer to drive away the animals from the field and sends an SMS to the farmer so that he is aware of the issue and may react by being present at the scene in case the animals don't flee after hearing the alarm. This completely protects the crops from animals, preventing loss to the farmer.



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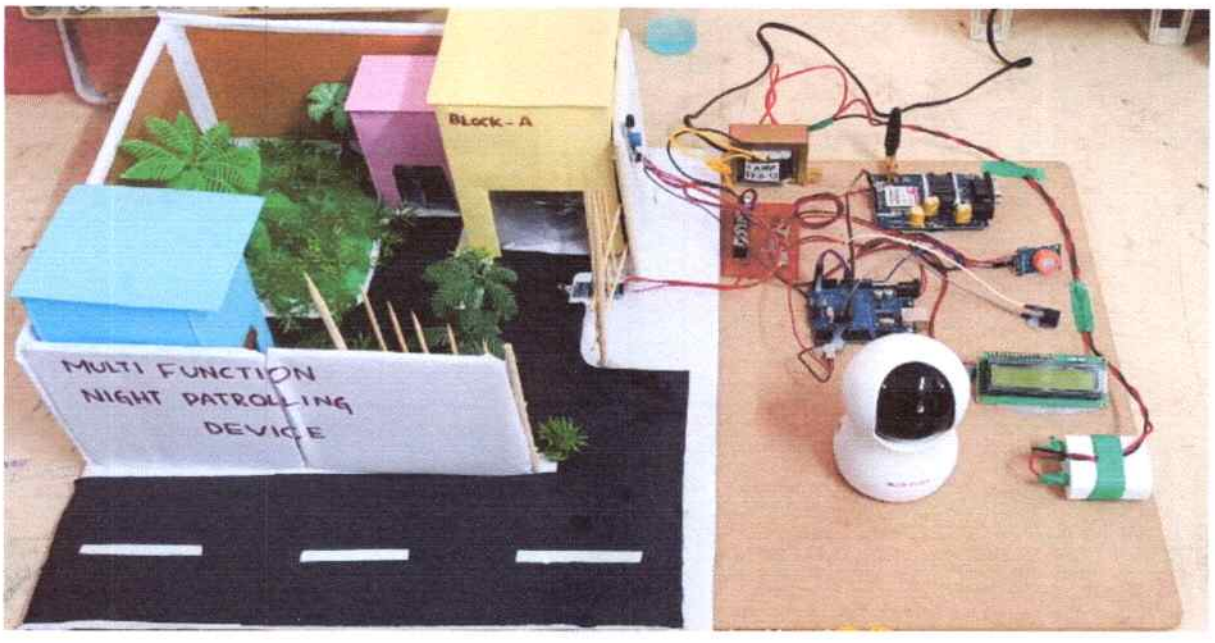
IOT-Based Multi-Function Night Patrolling Device



The project is based on the Night patrolling robot to monitor Extensive behavior and activity using multiple types of surveillance devices. This system can be used in residential areas, houses, apartments, etc.. The primary aim of the project is to design an Arduino-based security system that tracks several parameters and it used to overcome the rough terrains while maintaining stability. This system will be tracking the parameters like fire detection, alcohol detection, Alarm and if any one cross the wall in house or apartment or industry displayed on the LCD. It consists of various components like Arduino, Fire sensor, alcohol sensor, wall safety sensor, power supply, and so on. The security system will monitor the environment with the help of a sensor where if there is a slight deviation in the sensor value, then it will produce an alarm and alert the official according to the situation. The microcontroller receives the inputs from the sensors and delivers the output on LCD, Alarms when anything happened like fire accidents, we can store the data in IOT ESP8201 and we can upload the output data which is displayed LCD about the working of night Patrolling device in the website.

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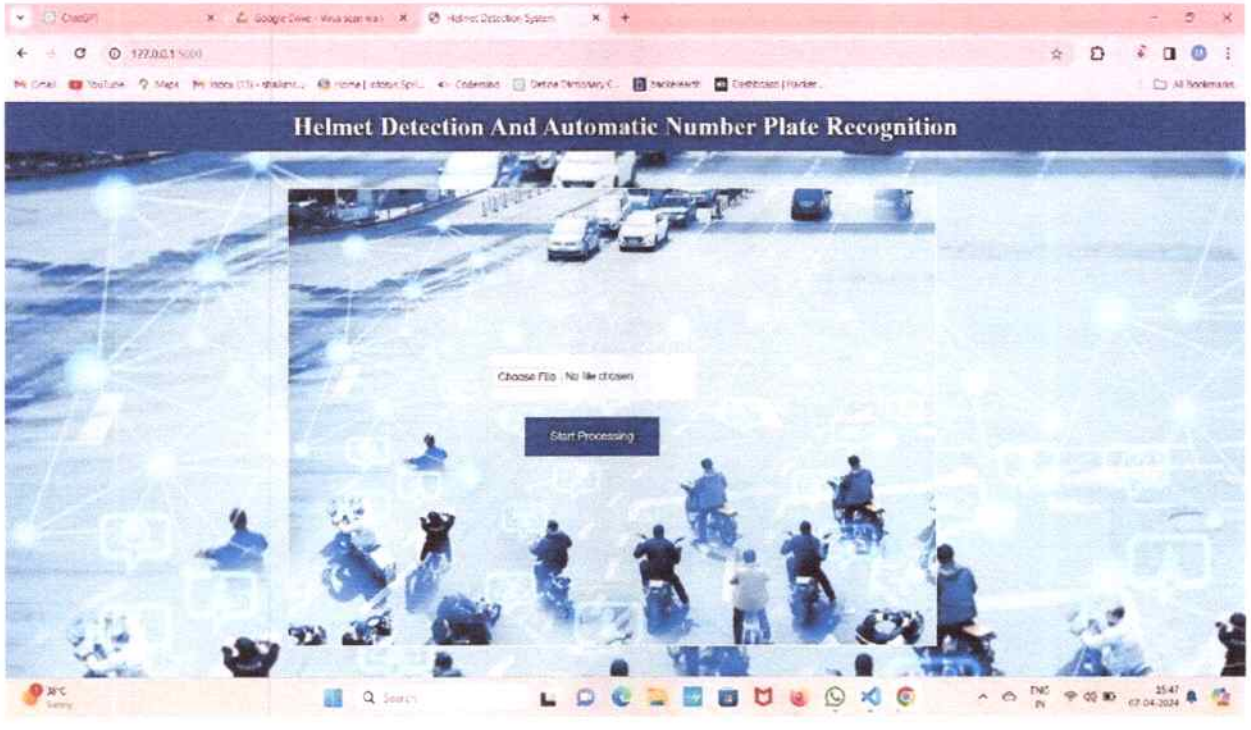
Machine Learning-Based Helmet Detection and Automatic License Plate Recognition



The majority of cyclist today have likely heard repeatedly that wearing a helmet while bicycling is the greatest method to protect your head and that doing so is incredibly dangerous. A crash while riding a motorcycle while not wearing a helmet is far more likely to result in death or head injury than if the motorcyclist's head was adequately protected. By patrolling road intersections or looking at CCTV footage, traffic enforcers fine persons who are seen riding a motorcycle without a helmet. This approach proposes an automated method for locating and obtaining motorcycle number plates from unhelmet riders captured on CCTV footage. The system categorizes non- motorcyclists and motorcyclists first using YOLO. Finally, the OCR algorithm can decipher the motorcycle's number plate for the rider who was not wearing a helmet. And at the last, a notification is sent to the specific user about the violation at the traffic junction. Using advanced algorithms like CNN, YOLO, and OCR, we made helmet detection more accurate. This means we're better at spotting helmets, which helps keep people safer.

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An Experimental Study on Self-Healing Concrete and Its Strength

In the present study, an attempt is made to arrest the cracks in concrete using bacteria called bacillus Subtilis and calcium lactate. The percentages of bacteria selected for the study are 0, 3%, 5% and 7% by weight of cement. In addition, calcium lactate was used at 5%, 10% and 15% replacement of cement by weight respectively. Additionally, 10% of calcium lactate was used for 3%, 5% and 7% of bacillus subtilis bacteria for checking purpose. Bacteria produce calcium carbonate crystals which block the micro cracks and pores in the concrete after reacting with calcium lactate. Bacterial selection depends upon the alkaline environment, where bacteria must survive. This bacterial concrete improves the compressive strength of concrete which was found by experimental study. Bacillus subtilis was adopted for this study. Compressive strength was analyzed in this study.

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MATERIAL SCIENCE AND TECHNOLOGY

IMPROVING SHOPPING MALL REVENUE BY REAL-TIME CUSTOMIZED DIGITAL COUPON ISSUANCE

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ABSTRACT

With the development of big data and deep learning technology, big data and deep learning technology have also been applied to the marketing field, which was a part of business administration. Customer churn management is one of the most important areas of marketing. In this paper, we proposed a method to prevent customer churn and increase purchase conversion rate by issuing customized discount coupons to customers with high churn rate based on big data in real time. After segmenting customer segments with two-dimensional segment analysis, a real-time churn rate estimation model based on clickstream data was generated for each segment. After that, we issued customized coupons to our customers. Finally, we tested the conversion rate and sales growth. A two dimensional cluster analysis-based churn rate estimation combined with a recommendation system was found to be significantly more useful than the respective simple models. Using this proposed model, it is possible to increase sales by automatically estimating the customer's churn probability and shopping propensity without the burden of marketing costs in the online shopping mall.

INDEX TERMS Customer churn prediction, Deep learning, Digital marketing, Ecommerce, Recommendation System.

I. INTRODUCTION:

With the development of big data and deep learning technology, big data and deep learning technology have also been applied to the marketing field, which was a part of management. Also, growth in internet adoption has made digital coupons a popular promotional tool [1]. Customized digital coupon issuance is a very important topic in online commerce. This is because maintaining existing customers is a more important business issue than acquiring new customers [2]. Also, retaining existing customers is much more economically advantageous than acquiring new customers [3]. In fact, the acquisition cost of new customers is known to be five to six times higher than the maintenance cost of existing customers [4]. Companies that have effectively managed customer churn by improving customer retention are known to have a positive effect not only on the company's profitability but also on improving brand image by improving customer satisfaction [5].

Customized coupon issuance research has traditionally been active in highly competitive and urgent sectors such as telecommunications, finance,distribution, and game industries, and has focused mainly on developing predictive models usingmachine learning and artificial intelligence technology [6]. Also, recently, AI-based marketing using big data analysis and deep learning is emerging.

Such AI-driven targeting can save huge amounts of marketing costs and raise online sales provided that the targeting model succeeds in estimating customer responsiveness accurately [7].

In particular, in the case of online shopping malls, the average purchase conversion rate is around 2%. Online shopping malls have the advantage of being easily accessed through the PC web or mobile web, but on the contrary, this advantage can be a disadvantage that it is easy to see and leave quickly. Therefore, even the slightest reduction of customer churn rate can lead to high conversions, which can lead to huge profits.

Unlike offline shopping malls, online shopping malls are easy to collect data. All online behavioral characteristics of customers can be collected in real time in the shopping mall's own DB. Therefore, it is possible to have a wealth of customer history data and to use it to understand customer tendencies. In conclusion, if you use rich customer historical data to infer behaviors and tastes, you can increase customer conversion rates without special promotions.

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A TWO-FOLD MACHINE LEARNING APPROACH TO PREVENT AND DETECT IOT BOTNET ATTACKS

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ABSTRACT

The botnet attack is a multi-stage and the most prevalent cyber-attack in the Internet of Things (IoT) environment thatinitiates with scanning activity and ends at the distributed denial of service (DDoS) attack. The existing studies mostly focuson detecting botnet attacks after the IoT devices get compromised, and start performing the DDoS attack. Similarly, theperformance of most of the existing machine learning based botnet detection models is limited to a specific dataset on whichthey are trained. As a consequence, these solutions do not perform well on other datasets due to the diversity of attack patterns.

Therefore, in this work, we first produce a generic scanning and DDoS attack dataset by generating 33 types of scan and 60types of DDoS attacks. In addition, we partially integrated the scan and DDoS attack samples from three publicly-availabledatasets for maximum attack coverage to better train the machine learning algorithms. Afterwards, we propose a two-foldmachine learning approach to prevent and detect IoT botnet attacks. In the first fold, we trained a state-of-the-art deep learningmodel, i.e., ResNet-18 to detect the scanning activity in the premature attack stage to prevent IoT botnet attacks. While, in thesecond fold, we trained another ResNet-18 model for DDoS attack identification to detect IoT botnet attacks. Overall, theproposed two-fold approach manifests 98.89% accuracy, 99.01% precision, 98.74% recall, and 98.87% f1-score to prevent anddetect IoT botnet attacks. To demonstrate the effectiveness of the proposed two-fold approach, we trained three other ResNet18 models over three different datasets for detecting scan and DDoS attacks and compared their performance with theproposed two-fold approach. The experimental results prove that the proposed two-fold approach can efficiently prevent anddetect botnet attacks as compared to other trained models.

Keyword: Machine Learning, Botnet Detection, Decision tree, AutoEncoder Algorithm, DNN, Comparison graph,Comparison Table..

I. INTRODUCTION:

The purpose of this document is to define and describe the requirements of the project and to spell out the system"s functionality and its constraints. Internet of Things (IOT) devices are

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A Novel Harmonic-Based Phase-Shifted Control via MSIQB Converter of Inductively Coupled Power Transfer

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Abstract— **A crucial concern for inductively linked power transfer systems is the high efficiency of output power regulation, particularly across a wide load range. In addition to the additional controller with the high gain dc-dc converter Multilevel Switched Inductor Quadratic Boost Converter (MSIQB), a novel harmonic-based phase-shifted control approach is also proposed in this study. With this technique, the transferred power is regulated by using the harmonic component of the resonant inverter output voltage rather than its fundamental component. The inverter's phase-shifted angle can be changed to adjust output power, and the system's gain is increased by using a Multilevel Switched Inductor Quadratic Boost Converter (MSIQB) on the source side. To improve its capacity to raise voltage, the MSIQB combines switching inductors with voltage multiplier cells. In comparison to a conventional boost converter, the MSIQB offers seven times more voltage gain at a duty ratio of 0.5 and reduces voltage stress across the switch. The MSIQB is also made to regulate the output dc link voltage with only one active switch by using a straightforward PID controller-based control strategy. This method differs from standard ways in that the switching frequency is substantially lower than the resonant frequency, which results in significantly decreased switching losses. The dead-time effect, switching method, and operation concept have all been discussed. The results of the experiments show that the proposed power control strategy can significantly increase performance under light load conditions.**

NOMENCLATURE

L_p	Total inductance of primary winding
L_s	Total inductance of secondary Winding
M	Mutual inductance
C_p	Resonant capacitor on primary side
C_s	Resonant capacitor on secondary side
R_p	Total resistance of primary winding
R_s	Total resistance of secondary winding
R_L	Load resistance
R_e	Equivalent resistance of load
Z_{pk}	Self-impedance of kth order harmonic component on primary side
Z_{sk}	Self-impedance of kth order harmonic component on secondary side
Z_r	Reflected impedance of the secondary circuit seen by the primary side
S_1 - S_4	Switching components
D_1- D_4	Freewheeling diodes
D_5- D_8	Diodes
C_f	Filter capacitance
V_{dc}	Voltage of dc input source
V_{inv}	Inverter output voltage
V_{pk}	Root mean square value of the kth-order harmonic component
V_{Rek}	Voltage of equivalent resistance of the k_{th}-order harmonic component
I_p	Inverter output current
I_{pk}	Inverter output current of the kth-order harmonic component
I_{sk}	Secondary winding current of the kth-order harmonic component
f_r	Resonant frequency
f_s	Switching frequency
ω_s	Switching angular frequency
ω_r	Resonant angular frequency
$\propto$	Phase shifted angle
t_d	Delay time of inverter
P_{out}	Output power on load
η	Transfer efficiency

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AIR QUALITY PREDICTION USING MACHINE LEARNING

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Abstract-

Air pollution is the largest environment and public health challenge in the world today. It can be described as one of the most dangerous threats that the humanity ever faced. It causes damage to animals, crops, forests etc. Air is getting polluted because of release of Toxic gases by industries, vehicle emissions and concentration of harmful gases and particulate matter in the atmosphere. Air quality has a significant impact on human health. The ability to predict air quality enables the government to take necessary steps to shield the most vulnerable, from being exposed to the air with hazardous quality. Traditional approaches to this task have very limited success because of a lack of access of such methods to sufficient meteorology data By integrating advanced technologies like Machine Learning, it has the potential to revolutionize environmental monitoring and contribute significantly to safeguard public health.

Keywords- Random Forest Algorithm, SO2 (Sulphur Dioxide), NO2 (Nitrogen Dioxide), RSPM (Respirable Suspended Particulate Matter), SPM (Suspended Particulate Matter).

INTRODUCTION

Air quality stands as a crucial aspect of public health and environmental well-being, yet it faces significant challenges due to industrial emissions and urbanization. These challenges often lead to harmful levels of pollutants in the air, posing risks to human health and the ecosystem. The Air Quality Index (AQI) is a national system used to measure and report air quality. [1].

To address these challenges, we have developed an innovative system for air quality monitoring and prediction. Key attributes such as sulphur dioxide (SO2) concentration, nitrogen dioxide (NO2) concentration, and particulate matter levels (RSPM, SPM, PM2.5) are analysed to provide accurate forecasts of air pollution levels [2]. By offering advance predictions, our system enables authorities and individuals to take proactive measures, mitigating the adverse effects of air pollution and safeguarding public health [3].

In addition to pollution prediction, our system integrates modules for environmental monitoring and pollutant analysis. The environmental monitoring module tracks air quality trends over time, facilitating informed decision-making for policy formulation and urban planning [3]. Furthermore, the pollutant analysis module identifies sources of pollution and evaluates their impact on air quality, aiding in the development of targeted interventions for pollution control.

The system serves as a valuable tool for environmental agencies, providing them with essential information and insights to enhance air quality management and protect public health. By integrating advanced technologies like Machine Learning, this system has the potential to revolutionize air quality management and significantly contribute to environmental sustainability.

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INTEGRATING MACHINE LEARNING ALGORITHMS WITHQUANTUM ANNEALING SOLVERS FOR ONLINE FRAUD DETECTION

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D. Kruparao Student, Dept. of CSE, Narasaraopeta Engineering College (Autonomous), Narasaraopet kruparao190@gmail.com

Abstract –
The challenge of detecting fraudulent transactions inreal time, proposing a novel framework utilizing quantum machine learning (QML) with Support Vector Machine (SVM) enhanced by quantum annealing solvers. Evaluating performance against traditional machine learning methods on bank loan dataset the results highlight the superiority of the quantum-enhanced SVM in both speed and accuracy for the bank loan data, while yielding comparable accuracy to other methods for credit card transactions. Feature selection significantly improves detection speed on dataset, albeit with marginal accuracy gains. This paper is proposed after careful study of algorithms like classification and regression, the algorithms that are useful for prediction model to get the best accurate value. With the quantum Annealing solvers, we are going to predict the fraudulent are non-fraudulent.

Keywords:
Cradit Card, Criminal Transactions, QuantumAnnealing, Anomaly Detection, Quantum Algorithms.

I INTRODUCTION

Fraudulent transactions cost businesses asignificant amount of money each year. In the US, businesses lose an average of $4 billion annually due to fraudulent transactions, while insurance companies in the UK facelosses of around £1.6 billion [1] from fraudulent transactionclaims. These losses not only include expenses for refunds, shipping, and other management costs but also result [2] in missed sales opportunities from trustworthy customers and damage to the company's reputation. The introduction of thepaper Credit card fraud detection using machine learning [3]presented at the 4th International Conference on Intelligent.

Computing and Control Systems (ICICCS) in MayEffective detection systems can help reduce these losses by identifying fraudulent transactions early. However, preventing and detecting fraud is challenging for several reasons. Firstly, the widespread use of mobile technologies has led to a substantial increase in online transactions, witha 110% rise in e-commerce transactions in the US alone in early 2020 compared to the previous year [4]. This surge in online activity has also led to an increase in web attacks targeting e-commerce retailers and associated fraudulent activities. Secondly, although there is a need for real-time or near real-time fraud detection [5] for online transactions, many existing systems are not fully effective as they only detect fraud after it has occurred.

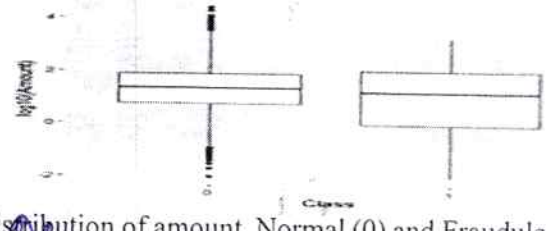

Fig 1: Distribution of amount, Normal (0) and Fraudulent (1)

BEST PRACTICE - II

1. Title of the Practice:
Ekalavya Programme (Encouraging students for self- learning)

2. Objectives of the Practice:
NEC believes in giving its students every opportunity to advance beyond the traditional curriculum, enhancing their learning experiences and expanding their career options. The graduate will have certain skills and competencies upon completion. The objective behind this practice is to provide an additional learning opportunity to all the students within the four-year graduation programme. Students also get remote access to simulation-based labs in a variety of science and engineering areas. Through remote experimentation, they will be able to acquire fundamental and sophisticated concepts. As a result, the institution strives to live up to its ultimate aim of "Promoting Collaborative and Self-Learning."

3. The Context:
After completing the degree, all engineering students expect to secure a dream career. However, curriculum alone may not be sufficient to achieve the desired outcome. In this context, the university has taken steps to give extra certification or training courses, as well as to prepare students to be industry-ready and equipped with the necessary engineering skills. For the implementation of skill upgrading and certification programmes, NEC has entered into agreements with organisations, enterprises, and academic institutions sponsored by the federal and state governments. The university has a partnership with certain related programmes that are open to students from all disciplines. As a result, students have the option to increase their awareness and pursue multidisciplinary programmes. Students can save time because many of the programmes are available online. The students can save time as many of the programmes are fast-paced. In the case of online programmes, students can pursue the courses at their own pace.

4. The Practice:
The institute encourages online learning. NEC has NPTEL local Chapter in association with IITM – Chennai. The institution had a tie up with Microsoft. This initiative has given an opportunity to both students and faculty to pursue many Microsoft online courses. Also, the institution has AP CM Skill Excellence center sponsored by APSSDC. Spoken tutorials offered by IIT Bombay are arranged for students. Dassault systems 3D experience lab is set up to enhance the modelling and analysis skills of students on advanced software. Students are motivated to do online certification courses offered by Sololearn, Udemy, AWS, Great learning. Institute has an MoU with ICT academy through which students are given basic training and allowed to practice on their own and further exposed to National and International level competitions on cutting edge technologies.

5. Evidence of Success:
The institute's efforts to promote additional certification courses and internships have yielded significant results. During the academic year 2023-24, NPTEL courses enriched the knowledge of over 1,274 students and faculty members. Additionally, more than 3100

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students successfully completed edX certifications and 3918+ students improve their knowledge by completing other MOOCs courses like Microsoft-AI Challenge, Cisco, Infosys Spring Board, MongoDB, AICTE Parakh, Primavera, Microsoft-Azure, SkillDZire, Hacker RanK, 360Digi, CodeSoft etc.

The completion of these courses undoubtedly provide students with a competitive edge, particularly in the technical rounds of job interviews. Moreover, the knowledge and skills gained from these courses can be directly applied to enhance performance in domain-specific areas at work. The institute's commitment in providing cutting-edge technology training aligns with the government's initiative to empower youth with the skills necessary to advance their careers and expand their professional horizons.

6. Problems Encountered and Resources Required:

1. Additional certification programmes may intimidate students. The completion of these online courses is required of all students. The additional course work may be tough for students to handle.
2. The academic calendar is usually set in stone. The examination timetable is rescheduled in the event of unforeseen circumstances. The NPTEL programme timetable may conflict with examination schedules in certain instances.
3. Students can pursue additional online courses from the comfort of their own homes. Some students, however, may not have access to the internet or sufficient bandwidth to complete the courses at home.

Resources Required

As a motivational gesture, students who received a gold certificate may be paid for their examination fee. Computer labs may be kept open beyond college hours to help students with internet Band problems they are having at home. Because the institute is autonomous, conflicts between end-of-semester exams and the NPTEL final test may be handled by postponing end-of-semester exams for the students' convenience..

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22471A0504
CSE A

ID: F74E258490B4

HackerRank

Certificate

22471A0504

This is to certify that

Biraka Velangini Rani

has successfully cleared the assessment for the skill

Python (Basic)

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16 May, 2023
Date

Harishankaran K
CTO, HackerRank

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Issued Date: 15-02-2024

CIN No- U85500HR2023PTC115118

CERTIFICATE
OF INTERNSHIP

UNIFIED MENTOR
YOUR SKILL, SUCCESS & JOURNEY

Bonam Venkata Siva Reddy

For successfully completing one month internship as Data Analyst Intern at Unified Mentor Pvt Ltd. Dated from 15-01-2024 to 15-02-2024
During the internship we found him/her consistent & hard-working. We wish them all the best for their future endeavors.

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Aatas Grover
Director

Sanket Patil
Awarded By

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Verify at:

AN ISO 9001:2015 Certified Company

C.ID: d454bd8

CodSoft

CERTIFICATE

OF COMPLETION
PROUDLY PRESENTED TO

MEDA NAVA DURGA

has successfully completed 4 weeks of a virtual internship program in
Python Programming
with wonderful remarks at **CODSOFT** from **10/03/2024 to 10/04/2024.**

We were truly amazed by his/her showcased skills and invaluable contributions to the tasks and projects throughout the internship.

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contact@codsoft.in www.codsoft.in Date: 13/04/2024

Networking Academy

Certificate of Course Completion

Nava Durga Meda

has successfully achieved student level credential for completing the Introduction to Cybersecurity course.

The student was able to proficiently:

- Explain the basics of being safe online, including what cybersecurity is and its potential impact.
- Explain the most common cyber threats, attacks, and vulnerabilities.
- Explain how to protect oneself while online.
- Explain how organizations can protect their operations against these attacks.
- Access a variety of information and resources to explore the different career options in cybersecurity.

Scan to Verify

January 10, 2024

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Laura Quintana

Laura Quintana
Vice President and General Manager
Cisco Networking Academy

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The certificate is awarded to

Akkala Srivalli

for successfully completing

Python Foundation Certification

on September 4, 2023

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Thirumala Arohi
Senior Vice President and Head
Education, Training and Assessment (ETA)
Infosys Limited

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Issued on: Monday, September 4, 2023
To verify, scan the QR code at https://verify.onwingspan.com

Microsoft

MADDI CHIDANANDA DEDEEPYA

has successfully passed all requirements for

Build a natural language processing solution with Azure AI Language

Credential ID: CEC4F90B749294EF

Earned on: February 1, 2024

✓ Online Verifiable

Satya Narayana Nadella

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Student Learning Assessment

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION, NEW DELHI

Student Learning Assessment

KURAPATI DIVYA (SLAS1473099)

2nd Year

COMPUTER SCIENCE AND ENGINEERING

NARASARAOPETA ENGINEERING COLLEGE (1-2146711)

Date : 10-01-2024

Type : Self-Assessment

Overall Rating

★★★★☆

★★★★★ Excellent | ★★★★☆ Very Good | ★★★☆☆ Good

Object-Oriented Programming ★★★★☆

- You can be an innovative engineer artist who can improvise and confront new situations.
- You can be an asset to any engineering industry.

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Company Identification Number (CIN Number) : U72900AP2019PTC111909
PAN Number : AAICC1770E, TAN Number : HYDC10078F
ISO Certificate Number : 031122019107
MSME Registration Certificate No : UDYAM-AP-06-0035821
Supraja Technologies Trademark Application ID No for Class 41 : 4146139
Supraja Technologies Trademark Application ID No for Class 42 : 4146144

SUPRAJA TECHNOLOGIES

We are honored to present this certificate to

Anusha Pallikonda

Presented this on 16th December, 2023

BEST STUDENT OF THE HACKATHON

PRINCIPAL
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SUPRAJA TECHNOLOGIES PVT. LTD. CHSMRLSS VIJAYAWADA APPROVED

This Certificate was awarded by :

Santosh Chaluvadi

Founder & CEO, Supraja Technologies
(a unit of CHSMRLSS Technologies Pvt. Ltd.)

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Ministry of MSME, Govt. of India

CERTIFIED ISO 9001:2015 COMPANY

Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)

This certificate is awarded to

KOLLIPARA RAMYA SRI ABHITHA

for successfully completing the course

Introduction to Internet of Things

with a consolidated score of **76** %

Online Assignments	25/25	Proctored Exam	51/75

Total number of candidates certified in this course:**32882**

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Jan-Apr 2024

(12 week course)

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Prof. Haimanti Banerji
Coordinator, NPTEL
IIT Kharagpur

Indian Institute of Technology Kharagpur

swayam

Roll No: NPTEL24CS35S663400819

To verify the certificate

No. of credits recommended: 3 or 4

Proof of Completion

Congratulations to

Soma Sekhar

For successfully completing

MongoDB Atlas Upgrades & Maintenance

On 05-10-2024

Sahir Azam
CPO
MongoDB, Inc

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MongoDB.

MDBkjhb9jvlxx

NPTEL

swayam

CERTIFICATE

OF APPRECIATION

is awarded to

TOP PERFORMING MENTOR

MODADUGU SAI YASWANTH

NARASARAOPETA ENGINEERING COLLEGE

GUNTUR, ANDHRA PRADESH

in recognition of his/her role as mentor for the NPTEL Online Certification course

INTRODUCTION TO INTERNET OF THINGS

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JAN - APR 2024

Mentees Enrolled	Mentees Present	Score (in %)	Certified (Score in %)				
		<40	40-59	60-74	75-89	>=90	Toppers
53	12	1	1	9	1	0	0

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PROF. ANDREW THANGARAJ
NPTEL Coordinator
IIT Madras

Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)

This certificate is awarded to

MUNDRU KRISHNAPRASAD

for successfully completing the course

Introduction to Internet of Things

with a consolidated score of **78** %

Online Assignments	25/25	Proctored Exam	52.5/75

Total number of candidates certified in this course:**32882**

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Jan-Apr 2024

(12 week course)

Prof. Haimanti Banerji
Coordinator, NPTEL
IIT Kharagpur

Indian Institute of Technology Kharagpur

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FREE ONLINE EDUCATION swayam शिक्षित भारत, उन्नत भारत

Roll No: NPTEL24CS35S663400407 To verify the certificate No. of credits recommended: 3 or 4

Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)

This certificate is awarded to

NANDIGAM SURENDRABABU

for successfully completing the course

Introduction to Internet of Things

with a consolidated score of **79** %

Online Assignments	25/25	Proctored Exam	54/75

Total number of candidates certified in this course:**32882**

Jan-Apr 2024

(12 week course)

Prof. Haimanti Banerji
Coordinator, NPTEL
IIT Kharagpur

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Indian Institute of Technology Kharagpur

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Roll No: NPTEL24CS35S563400886 To verify the certificate No. of credits recommended: 3 or 4