



## Bearing Capacity of Foundation: Review

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**ABSTRACT** – Bearing capacity is the most important aspect of the geotechnical engineering. The foremost requirement of any structure is safety and stability with achieving economy. So, to design any structure estimation of bearing capacity is compulsory. Several research works have been done in the last few decades for the estimation of ultimate bearing capacity of shallow foundations in cohesionless as well as cohesive soils through experimental studies on model footings and theoretical analyses. The objective of this paper is to present some of the rigorous works carried out so far using the above methods and to bring out the limitations of them.

**Keywords:** bearing, foundation, raft

### 1. INTRODUCTION

All civil engineering structures whether they are buildings, dams, bridges etc. are built on soils. A foundation is required to transmit the load of the structure on a large area of soil. The foundation of the structure should be so designed that the soil below does not fail in shear nor there is the excessive settlement of the structure. The conventional method of foundation design is based on the concept of bearing capacity. Soil when stressed due to loading, tend to deform. The resistance to deformation of the soil depends upon factors like water content, bulk density, angle of internal friction and the manner in which load is applied on the soil. The maximum load per unit area which the soil or rock can carry without yielding or displacement is termed as the bearing capacity of soils. Soil properties like shear strength, density, permeability etc., affect the bearing capacity of soil. Dense sand will have more bearing capacity than loose sand as unit weight of dense sand is more than loose sand. If the bearing capacity of soil at shallow depth is sufficient to safely take the load of the structure, a shallow foundation is provided. Isolated footing, combined footing or strip footing are the option for the shallow foundation. Deep foundations are provided when soil immediately below the structure does not have the adequate bearing capacity. pile, piers or well are the options for deep foundations.

Foundation is the lower most hidden but very important part of any structure whether it is onshore or offshore structure. It is the part which receive huge amount of load from superstructure and distribute it to ground. So, the foundation should be strong enough to sustain the load of superstructure. The performance of a structure mostly depends on the performance of foundation. Since it is a very important part, so it should be designed properly. Design of foundation consists of two different parts: one is the ultimate bearing capacity of soil below foundation and second is the acceptable settlement that a footing can undergo without any adverse effect on superstructure. Ultimate bearing capacity means the load that the soil under the foundation can sustain before shear failure, while, settlement consideration involves estimation of the settlement caused by load from super structure which should not exceed the limiting value for the stability and function of the superstructure. Ultimate bearing capacity problem can be solved with the help of either analytical solution or

load applied to the ground. The bearing capacity of soil is the maximum average contact pressure between the foundation and soil which should not be produced shear failure in the soil. In geotechnical engineering, bearing capacity is the capacity of soil to support the loads applied to the ground. The bearing capacity of soil is the maximum average contact pressure between the foundation and the soil which should not produce shear failure in the soil. Ultimate bearing capacity is the theoretical maximum pressure which can be supported without failure; allowable bearing capacity is the ultimate bearing capacity divided by a factor of safety. Sometimes, on soft soil sites, large settlements may occur under loaded foundations without actual shear failure occurring; in such cases, the allowable bearing capacity is based on the maximum allowable settlement. A foundation is the part of a structure which transmits the weight of the structure to the ground. All structures constructed on land are supported on foundations. A foundation is a connecting link between the structure proper and the ground which supports it. All civil engineering structures whether they are buildings, dams, bridges etc. are built on soils. A foundation is required to transmit the load of the structure on a large area of soil. The foundation of the structure should be so designed that the soil below does not fail in shear nor there is the excessive settlement of the structure. The conventional method of foundation design is based on the concept of bearing capacity.

Soil when stressed due to loading, tend to deform. The resistance to deformation of the soil depends upon factors like water content, bulk density, angle of internal friction and the manner in which load is applied on the soil. The maximum load per unit area which the soil or rock can carry without yielding or displacement is termed as the bearing capacity of soils. Soil properties like shear strength, density, permeability etc., affect the bearing capacity of soil. Dense sand will have more bearing capacity than loose sand as unit weight of dense sand is more than loose sand.

Research on the ultimate bearing capacity problems can be carried out using either analytical solutions or experimental investigations. The former could be studied through theory of plasticity or finite element analysis, while the latter is achieved through conducting prototype, model and full-scale tests. A

# Sentimental Analysis on Social Media by using Deep Learning

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**Abstract**— Detection of depression through messages sent by a user on social media can be a complex task due to the popularity and trends in them. In recent years, messages and social media has ended up being a very close representation of a person's life and his mental state. This is a huge stockpile of data about a person's behavior and can be used for detection of various mental illnesses (depression in our case) using Natural Language Processing and Deep Learning. This project is about constructing a deep learning model using NLP to predict such mental disorders. STM networks are well-suited to classifying, processing and making predictions based on time series data, since there can be lags of unknown duration between important events in a time series.

**Keywords**— depression, social media, mental illness, deep learning, NLP

## INTRODUCTION

Depression as a common mental health disorder has long been denned as a single disease with a set of diagnostic criteria. It often co-occurs with anxiety or other psychological and physical disorders; and has an impact on feelings and behavior of the affected individuals. According to the WHO study, there are 322 million people estimated to suffer from depression, equivalent to 4.4% of the global population. In today's world, communication through social media is emerging as a big deal. They're willing to share their thoughts, stories and their personal feelings, mental states, desires on social network sites , blogging platforms etc.. Receivers use the manuscripts from emails and other types of social media comments to form proper reasoning and to correct the mistakes. When people write digitally on social media, their texts are processed automatically. Natural language processing techniques are used to infer people's mental behavior.

According to WHO, depression is a common worldwide folio that affects an enormous amount of individuals irrespective of their age. There are multiple factors that interfere the depression detection and treatment like lack of professional specialists, social shaming, improper diagnosis and so on. The ever-lasting depression disorder could lead to suicide if the depressed individuals are not supplied with proper consultancy, instant help and can also suffer from anxiety. This work is targeted on the detection of depression and anxiety from tweets. The experiment conducted during this work requires the text data so the chosen data source is Twitter where people tweet about their feelings, hopes, desires, thoughts, stories and mental states.

The goals of our research are: collect the publicly available media messages of healthy and self-diagnosed individuals which contains mixed emotions so evaluate the extracted Twitter data and apply NLTK and deep learning classifiers such as LSTM-RNN to predict depressive and anxiety tweets. We can search for a solution to a performance increase through a proper features selection and their multiple feature combinations. First, we choose the most beneficial linguistic features applied for depression identification to characterize the content of the posts. Second, we analyze the correlation significance, hidden topics and word frequency extracted from the text. We compare the performance results based on three single feature sets and their multiple feature combinations. In our experiment, we use data collected from the Reddit social media platform.

## AIMS AND OBJECTIVE

- Identify the most effective deep neural network architecture among a few of selected architectures that were successfully used in natural language processing tasks.
- The architectures are used to detect users with signs of mental illnesses (depression in our case) given limited unstructured text data extracted from the Twitter social media platform.
- To investigate the effect of depression detection, we propose Deep learning technique as an efficient and scalable method.
- The main contribution of this study lies in exploiting a rich, diverse, and discriminating feature set that contains both tweet text and behavioral trends of different users.
- This study can be extended in the future by considering more DL models that are highly unlikely to over-fit the used data and find a more dependable way to measure the features' impact.

## III. LITERATURE SURVEY

MICHAEL M. TADESSE, HONGFEI LIN, BO XU, AND LIANG YANG: we can significantly improve performance accuracy. The best single feature is bigram with the Support Vector Machine (SVM) classifier to detect depression with 80% accuracy and 0.80 F1 scores. The strength and effectiveness of the combined features (LIWC + LDA + bigram) are most successfully demonstrated with the Multilayer Perceptron (MLP) classifier resulting in the top performance for depression detection reaching 91% accuracy and 0.93 F1 scores [3].

P.V. Rajaraman Asim Nath, Akshaya P.R, Chatur Bhuja G: Messages and social media has ended up being a very close representation of a person's life and his mental state. This is a huge stockpile of data about a person's behaviour and can be used for detection of various mental illnesses (depression in our case) using Natural Language Processing and Deep Learning [1].

Akshi Kumara, AditiSharmab, AnshikaArorac : This mixed anxiety-depressive disorder is a predominantly associated with erratic thought process, restlessness and

sleeplessness. Based on the linguistic cues and user posting patterns, the feature set is defined using a 5-tuple vector <word, timing, frequency, sentiment, contrast>. An anxiety-related lexicon is built to detect the presence of anxiety indicators. Time and frequency of tweet is analyzed for irregularities and opinion polarity analytics is done to find inconsistencies in posting behaviour. The model is trained using three classifiers (multinomial naïve bayes, gradient boosting, and random forest) and majority voting using an ensemble voting classifier is done [2].

Michael M. Tadesse ; Hongfei Lin ; Bo Xu ; Liang Yang: We can significantly improve performance accuracy. The best single feature is bigram with the Support Vector Machine (SVM) classifier to detect depression with 80% accuracy and 0.80 F1 scores. The strength and effectiveness of the combined features (LIWC + LDA + bigram) are most successfully demonstrated with the Multilayer Perceptron (MLP) classifier resulting in the top performance for depression detection reaching 91% accuracy and 0.93 F1 scores. According to our study, better performance improvement can be achieved by proper feature selections and their multiple feature combinations [6].

Hoyun Song, Jinseon You, Jin-Woo Chung Jong C. Park: we propose Feature Attention Network (FAN), inspired by the process of diagnosing depression by an expert who has background knowledge about depression. We evaluate the performance of our model on a large scale general forum (Reddit Self-reported Depression Diagnosis) dataset. Experimental results demonstrate that FAN shows good performance with high interpretability despite a smaller number of posts in training data. We investigate different aspects of posts by depressed users through four feature networks built upon psychological studies, which will help researchers to investigate social media posts to find useful evidence for depressive symptoms [7].

Raza Ul Mustafa, Noman Ashraf,  
Fahad Shabbir, Ahmed Javed Ferzund,  
Basit Shahzad, Alexander Gelbukh: A sample of

their recent tweets collected ranges from (200 to 3200) tweets per person. From their tweets, we selected 100 most frequently used words using Term Frequency-Inverse Document Frequency (TF-IDF). Later, we used the 14 psychological attributes in Linguistic Inquiry and Word Count (LIWC) to classify these words into emotions. Moreover, weights were assigned to each word from happy to unhappy after classification by LIWC and trained machine learning classifiers to classify the users into three classes of depression High, Medium, and Low. According to our study, better features selections and their combination will help to improve performance and accuracy of classifiers [4].

Kali Cornn : a dataset of scraped Reddit comments, this project aims to classify depression in comments. Focusing on the setting of social media, this project explores methods of machine learning and neural network architectures for identifying depression in digitally shared text entries. This project developed machine learning (logistic regression, support vector machines), a BERT-based model, and neural networks with and without word embeddings (CNN) for this classification task [5].

#### IV. DESIGN AND IMPLEMENTATION

##### A. Proposed System

Mental illness detection in social media can be considered a complex task, mainly due to the complicated nature of mental disorders. In recent years, this research area has started to evolve with the continuous increase in popularity of social media platforms that became an integral part of people’s life. This close relationship between social media platforms and their users has made these platforms to reflect the users’ personal life with different limitations. In such an environment, researchers are presented with a wealth of information regarding one’s life. In addition to the level of complexity in identifying mental illnesses through social media platforms, adopting supervised machine learning approaches such as deep neural networks have not been widely accepted due to the difficulties in

obtaining sufficient amounts of annotated training data. Due to these reasons, we try to identify the most effective deep neural network architecture among a few of selected architectures that were successfully used in natural language processing tasks. We present a new model NLTK with LSTM. The chosen architectures are used to detect users with signs of mental illnesses (depression in our case) given limited unstructured text data extracted from the Twitter social media platform.

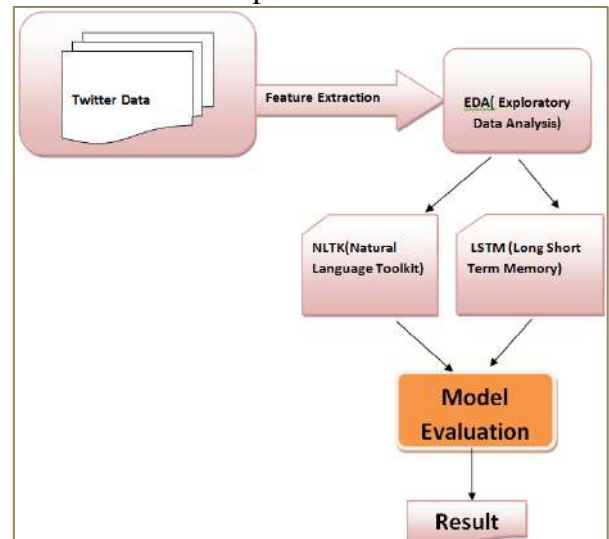


Fig. 1 System flow Diagram



Fig. 2 Data Flow Diagram

Data for the model will be extracted from the Twitter website. Data will be in unstructured format and it will have lots of useless data. So we will first do data cleaning. Once we clean the data we will apply EDA for finding the polarity of the data like positive, neutral, or negative automatically or many complex sentiments like happiness, sadness, anger, joy, etc. Once EDA is done will pass the data to the NLTK model and LSTM model and we will select the model giving the best accuracy.

### Modules

1) *Data selection*: A training set is used to train the machine learning process to understand the potential relationship between the explanatory variables and target variable.

2) *Data Cleaning*: Data cleaning means filtering and modifying your data such that it is easier to explore, understand, and model. Filtering out the parts you don't want or need so that you don't need to look at or process them.

3) *Data imputation*: Machine learning algorithms require numeric input values, and a value to be present for each row and column in a dataset. As such, it is common to identify missing values in a dataset and replace them with a numeric value.

4) *Data Analysis*: A method of data analysis that automates analytical model building. It is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention.

5) *Data visualization*: Data visualization is the representation of data or information in a graph, chart, or other visual format. Machine learning makes it easier to conduct analyses such as predictive analysis, which can then serve as helpful visualizations to present.

6) *Training*: Training data is the data you use to train an algorithm or machine learning model to predict the outcome you design your model to predict.

7) *Testing*: A test dataset is a dataset that is independent of the training dataset, but that

follows the same probability distribution as the training dataset.

8) *Algorithm selection*: Machine learning algorithms are the engines of machine learning, meaning it is the algorithms that turn a data set into a model.

### B. Proposed Methodology

The goal of our analysis is to gather the publically accessible media messages to gauge the extracted Twitter information and apply NLTK and deep learning classifiers like LSTM-RNN to predict depressive and anxiety tweets.

First, we elect the foremost helpful linguistic options applied for depression identification to characterize the content of the posts. Second, we tend to analyze the correlation significance, hidden topics and word frequency extracted from the text.

Sentiment analysis, works because of language process (NLP) to mechanically confirm the emotional tone behind on-line conversations.

There are a unit completely different algorithms we'll implement in our project, betting on what proportion information have to be compelled to analyze, and the way correct it wants our model to be.

1) language Toolkit (NLTK): The language Toolkit may be a suite of libraries and programs for symbolic and applied mathematics language process (NLP) for English written within the Python artificial language. NLTK includes graphical demonstrations and sample information. it's amid a book that explains the underlying ideas behind the language process tasks supported by the toolkit, and a cookery book.

NLTK may be a powerful Python package that gives a group of numerous natural languages algorithms. It is free, open supply, simple to use, giant community, and well documented. NLTK consists of the foremost common algorithms like tokenizing, part-of-speech tagging, stemming, sentiment analysis, topic segmentation, and named entity recognition. NLTK helps the pc to

analysis, pre-process, and perceive the written language.

2) Long Short Term Memory (LSTM): The central role of AN LSTM model is command by a memory cell referred to as a 'cell state' that maintains its state over time. The cell state is that the horizontal line that runs through the highest of the below diagram. It is visualised as a conveyor through that info simply flows, unchanged. info is adscititious to or off from the cell state in LSTM and is regulated by gates. These gates optionally let the data flow in and out of the cell. It contains a point-wise multiplication operation and a sigmoid neural web layer that assist the mechanism.

#### V. CONCLUSION

We have exhibited the capability of using twitter as a tool for measuring and detecting major depression among its users. To give a clear Feature Attention Network:

Interpretable Depression Detection from Social Media understanding of our work, numbers of research challenges were stated. The algorithms are designed to analyze the tweet for emotion detection as well as for detection of suicidal thoughts among people on social media. The mechanism does analysis of the tweets for prediction of depression without checking the validity of tweets. Social media is an open platform where many people refrain from telling their true emotions that might relate to depression they are facing, and so the model analysis here are mostly based on the prediction from posts using various machine learning algorithms. The main requirement of model is to be perfectly able to predict the result as there are a number of implementations that require verification of data before predicting the thoughts or posts of the person as suicidal or non-suicidal, we will developed new model with combination NLTK & LSTM for better Performance result.

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# Security and Privacy Preserving of Data using CP-ABE Scheme

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**Abstract:** Due to the rapid development of new technologies, data security is one of the big challenges in today's world. Particularly, in the healthcare field, a large amount of data is generated every day. To maintain the patient personal records by manually and handling them, is not very sure, and Also avoiding the paper-work in the health care industry is not a good practice. As more records are stored electronically they need security and confidentiality. Different methods were proposed to prevent both internal and external threats in the healthcare industry. In healthcare industries record are extremely sensitive; therefore requires more security and privacy when storing and sharing of those records. The security as well as the privacy of sensitive health records are the major challenges in health care industries. To prevent unauthorized access to the healthcare records the user should be authenticated to get access to the records. To secure the data, cryptography techniques are used. The first is symmetric key encryption techniques which use only one key for both encryption and decryption of the data. Their design simple but can be easily cracked by using brute force attacks. On the other hand, the second is asymmetric key encryption techniques which use a pair of keys, one for encryption, and the other for decryption, whose security is higher as compared to the symmetric key encryption ones but lack in time efficiency. In our proposed system different access control mechanisms are used to provide security and confidentiality on healthcare records.

**Keywords**

## I. INTRODUCTION

Data is continuously exchanged over different networks. It is correct to say that a huge part of the data is private or confidential which demands stronger techniques of encryption. There are two commonly used cryptography techniques for securing the data that is transmitted over the network, these are encryption and decryption. Therefore, there are a lot many encryption-decryption systems to encrypt and decrypt the transmitted information. The first is symmetric key encryption techniques which use only one key for both encryption and decryption of the data. Their design simple but can be easily cracked using brute force attacks. On the other hand, the second is asymmetric key encryption techniques which use a pair of keys, one for encryption, and the other for decryption, whose security is higher as compared to the symmetric key encryption ones but lack in time efficiency.

We want to store the data in cloud computing provide many advantages in today's IT world, which enable flexibility and low-cost usage of computing resource. It provides computing resources dynamically via the internet but has some challenges related to data confidentiality, data privacy, and security that may occur. In health care industries record are extremely sensitive; therefore required more security and privacy when storing and sharing those records. The security, as well as the privacy of the sensitive health records, is the major challenge that prevents in the health care industries. To prevent this from unauthorized Access to the health records the user will have to be authenticated to get access to the record. In this paper, we have developed a new health care system to increase patient trust and information integrity through privacy and security. By using the ECC with CP-ABE are providing more security and privacy of health care records. the implementation is proposed using python as the high-level programming language. python supports built libraries to develop cryptographic implementations. There are many third-party organizations and developer communities that provide cryptographic extensions to develop projects. Minimum time required to access and deliver records. To make the system more secure. Less time spent on non-value-added tasks.

## II. AIM & OBJECTIVE

The purpose is to design a medical application that contains up to date information about the medical industry. That should improve the efficiency of medical record management. Providing the online interface for data owner and data user etc. Increasing the efficiency of medical record management. Minimum time required to access and deliver user records. To make the system more secure. Less time spent on non-value-added tasks. ECC is better than RSA, they provide better security by our proposed system. The CP-ABE are providing more security and privacy of health care records. The main aim of the proposed system to increase patient trust and information integrity through privacy and security.

### III. LITERATURE SURVEY

Yujiao Song, HaoWang, XiaochaoWei, LeiWu: They design an ABE scheme that protects user's privacy during key issuing. In this scheme, they separate the functionality of attribute auditing and key generating to make ensure that the KGC cannot know the user's attributes and so that the attribute auditing center (AAC) cannot obtain the user's secret key and the data will be secure.

Muhammad Yasir Shabir, Asif Iqbal, Zahid Mahmood\_, and AtaUllah Ghafoor: In this paper Storing sensitive data on untrusted servers is a big challenge. For confidentiality, proper access control for sensitive data and encryption techniques are used. However, such access control strategies are not feasible in cloud computing because of their insufficiency of flexibility, scalability, and fine-grained access control.

Rather than that Attribute-Based Encryption (ABE) techniques are used in the cloud. This paper completely surveys all ABE schemes and creates a balancing table for the key criteria in cloud applications.

Kamlesh Gupta; Sanjay Silakari; Ranu Gupta; Suhel A. Khan: They are proposed an image encryption method using elliptic curve cryptography (ECC).

RSA is too slow than ECC because ECC requires a smaller key size. In this technique, every pixel of the original image is transformed into the elliptic curve point  $(X_m, Y_m)$  and those elliptic curve points convert into cipher image pixel. The proposed system gives an equally small block size, high speed, and security.

Saeid Bakhtiari; Subariah Ibrahim; Mazleena Salleh; Majid Bakhtiari: They are proposed image encryption by using ECC and before image compression is proposed system. The results of the proposed system and analysis of applying ECC for image encryption/decryption, encryption performance, and compression performance.

M. Vignesh, Naresh: In Electronic Health Records data stored on the cloud they need security and privacy concerns. Different technic was proposed to prevent both internal and external threats in the healthcare structure. In this paper, different access control mechanisms are used to gives security and confidentiality on Personal Health Records. Electronic Health Record, Cloud data Storage, Access Control mechanism ...etc

Karishma Bhirud, Dipashree Kulkarni, Renuka Pawar, Prachi Patil: Their proposed system used an Elliptic Curve Cryptography algorithm.

The ECC has generated the key using a point on the curve and encryption and decryption techniques happen through the curve. In this paper, the encryption and key generation process takes place rapidly.

Vipul Goyal, Omkant Pandey, Amit Sahai Brent Waters x: In this paper, they develop a new cryptosystem to grain and shared encrypted data that is known as Key-Policy Attribute-Based Encryption (KP-ABE). The ciphertexts are tagged with sets of attributes and the private keys are connected with access structures that control which ciphertext user can decrypt the data. They show the applicability of construction to the sharing control list and broadcast encryption. The construction supports the delegation of private keys which carry a Hierarchical Identity-Based Encryption (HIBE).

### IV. PROPOSED SYSTEM

To avoid the drawback of the existing manual system, we propose the computerized system. This system helps in maintaining the database of the medical organization. This system provides easy access to patient information at any time and can be kept safely for a long period without any damage.

A manual system requires a lot of time and manpower. But, in this system, all work is computerized. So, the accuracy of the data is also maintained. Maintaining backup is very easy also. This system allows authorized members to access the record of the medical industry. date owner will manage the whole system.

The design of the patient healthcare information management system. we propose a novel updated CP-ABE system which can be used for the medical record. we develop medical healthcare application where data owner will be select the file from their system and generate public and private key's by using ECC algorithm, While date owner defines the access policy by using CP-ABE and encrypt a file by using AES (128 bit) algorithm will be stored in personal system Data user will send a request to the data owner for accessing records.

If the requested record is found the key will be exchanged using the Diffie-hellman key exchange algorithm. while checking access policy in the ciphertext of the attribute-based decryption can be done or else due to unauthorized accesses and noncompliance of the access policies decryption will be denied.

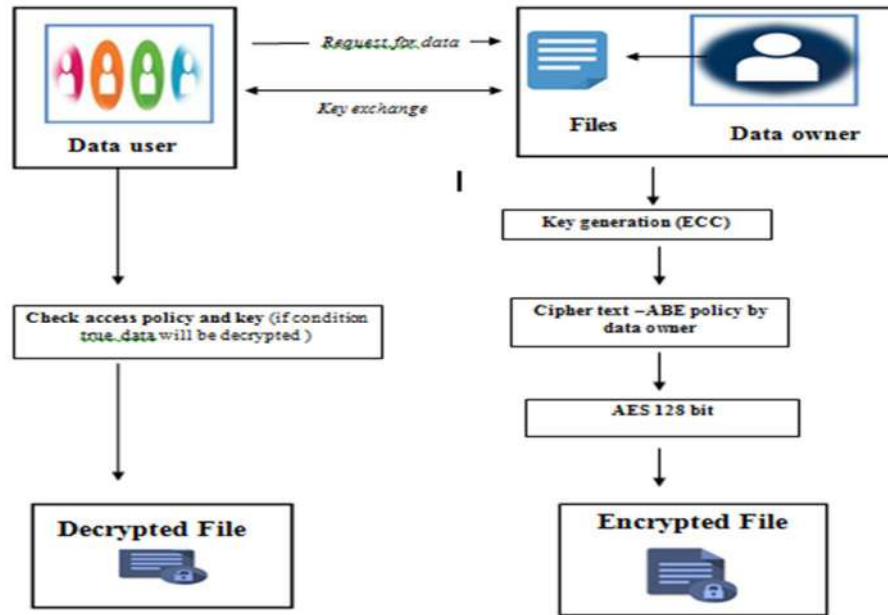


Fig: system flow Diagram

#### A. Modules

- 1) **Data Owner:** The data owner will select the file from their system and will generate public and private keys by using the ECC algorithm, while the data owner defines the access policy by using CP-ABE(ciphertext attributed based encryption) then encrypts the file by using AES (128 bit) algorithm. The encrypted file will be stored on the personal system.
- 2) **Key Generation:** The public and private keys will be generated By using the ECC algorithm. Using the form  $y^2=x^3+ax+b$ .
- 3) **Ciphertext –ABE policy:** The data owner will decide the access policy for authorized users, who will have decryption access for the encrypted files.
- 4) **Encrypted File:** The data owner will encrypt the data file using CP-ABE and AES(128 bit )algorithm.
- 5) **Decrypted File:** Data user request for a file to the data owner. The key will be exchanged using the Diffie –Hellman key exchange algorithm. The data owner will check the key with CP-ABE access policy with keys, if the accesses policy condition is satisfied then decryption will be performed otherwise decryption is not allowed to the data user.
- 6) **Data User:** The data user will send a request to the data owner for accessing records. if the requested record is found the key will be exchanged using the Diffie-hellman key exchange algorithm. while checking access policy in the ciphertext of the attribute-based decryption can be done or else due to unauthorized accesses and noncompliance of the access policies decryption will be denied.

## V. RESEARCH METHODOLOGY

#### A. Elliptic Curve Cryptography

Elliptic-curve cryptography (ECC) is an approach to public-key cryptography based on the algebraic structure of elliptic curves over finite fields. ECC requires smaller keys compared to non-EC cryptography (based on plain Galois fields) to provide equivalent security. Elliptic curves are applicable for key agreement, digital signatures, pseudorandom generators, and other tasks. Indirectly, they can be used for encryption by combining the key agreement with an asymmetric encryption scheme. They are also used in several integer factorization algorithms based on elliptic curves that have applications in cryptography, such as Lenstra elliptic curve factorization.

The use of elliptic curves in public-key cryptography was proposed by Koblitz and Miller independently in 1985 and since then, an enormous amount of work has been done on elliptic curve cryptography.

A general elliptic curve takes the general form as:

$$y^2=x^3+ax+b$$

Where  $x, y$  are keys and  $a, b$  are integer modulo  $p$ , which satisfies

**B. Diffie-Hellman Key Exchange**

Diffie -Hellman key exchange Algorithms is developed by Whitefield Diffie and Martin Hellman in 1976 to overcome the problem of key agreement and exchange. It enables the two parties who want to communicate with each other to agree on a symmetric key, the key can be used for encrypting and decryption, note that Diffie Hellman key exchange algorithm can be used for only key exchange not for encryption and decryption process. The algorithm is based on mathematical principles.

The algorithm is based on Elliptic Curve Cryptography which is a method of doing public-key cryptography based on the algebra structure of elliptic curves over finite fields. The DH also uses the trapdoor function just like many other ways to do public-key cryptography.

A general form as:

$$(g^a \text{ mod } p)^b \text{ mod } p = g^{ab} \text{ mod } p$$

$$(g^b \text{ mod } p)^a \text{ mod } p = g^{ba} \text{ mod } p$$

**C. Attribute-Based Encryption**

It is a public key algorithm based on many encryptions and user attributes that allows the users to encrypt and decrypt the information so that the structured accessed contains the certified sets of attributes and restricts the notice to monotone access structure.

1) Attribute-based encryption is more flexible.

2) The ABE is secure because the encryption data contain the attributed rather than data

a) *Key Policy ABE*: In KP ABE data sender use a collection of attributes to labels cipher. A trusted authority issues the private key of the user from an access structure that specifies the type of ciphertext that can be decrypted. The KP ABE is suitable for organizations with hierarchies that specify which file is accessible by which user.

b) *Cipher-Text Policy ABE*: In CP-ABE Scheme a data sender encrypts the message using a traditional encryption scheme. An access policy is specified in form of access structure over attributes in the cipher-text. The access structure specifies users that are capable of accessing the cipher-text. The users decrypt the cipher-text if only their attributes match the access policy associated with the encrypted data.

- It is more suitable for use in actual Applications within the environments.
- It is capable of specifying the users that can decrypt the encrypted version of the file.

**D. AES Algorithm**

AES is an iterative rather than a Feistel cipher. It is based on ‘substitution–permutation network’. It comprises a series of linked operations, some of which involve replacing inputs by specific outputs (substitutions) and others involve shuffling bits around (permutations). Interestingly, AES performs all its computations on bytes rather than bits. Hence, AES treats the 128 bits of a plaintext block as 16 bytes. These 16 bytes are arranged in four columns and four rows for processing as a matrix. Unlike DES, the number of rounds in AES is variable and depends on the length of the key. AES uses 10 rounds for 128-bit keys, 12 rounds for 192-bit keys, and 14 rounds for 256-bit keys. Each of these rounds uses a different 128-bit round key, which is calculated from the original AES key. The schematic of the AES structure is given in the following illustration

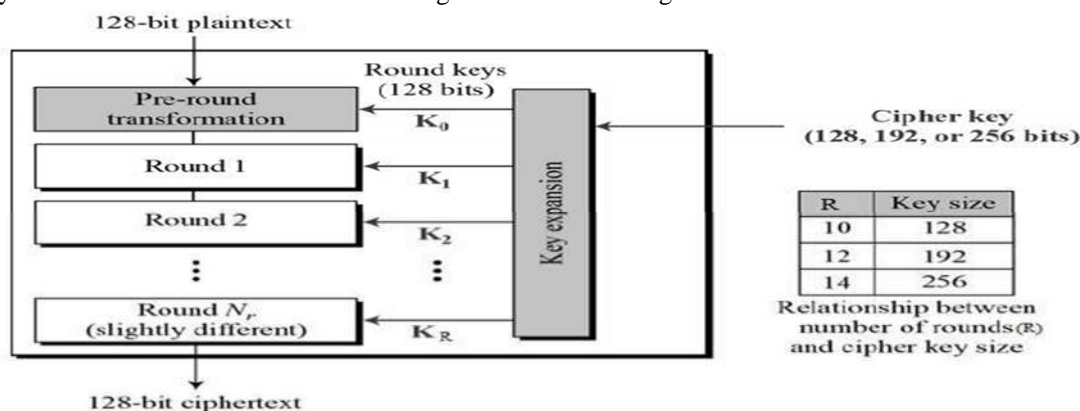


Fig. schematic structure of AES



## VI. CONCLUSION

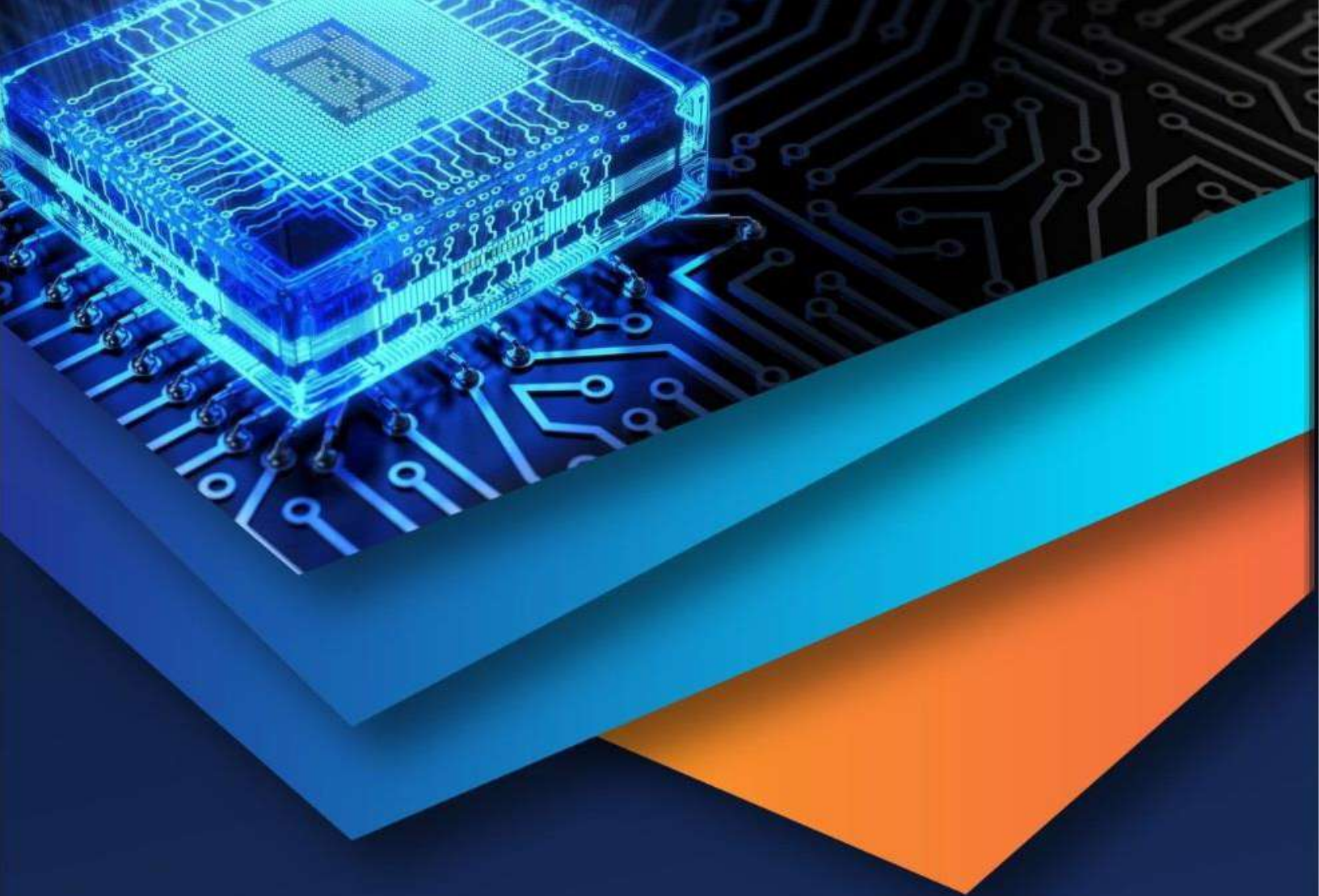
Health Care System lead to a better organization structure since the information management of the patients is well structured & also lead to better as well as efficient utilization of resources. The system has been developed error free and at the same time, it is efficient and less time-consuming.

This system is only for the health care industries. The information is stored in the system can be accessed at any time by using this system & there will be no wastage of resources in health care industries. So this system performs paperless work & manages all data efficiently. It provides easy, accurate, unambiguous & faster data access.

The purpose of developing this software is to generate the desired reports accesses as required. We Conclude that this project adequately manages all the information & provide security to the medical record.

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# STUDY OF LEACH PROTOCOL TO REDUCE NETWORK AREA ENERGY IN WIRELESS SENSOR NETWORK

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**Abstract** - In remote sensor systems, filter convention control is more proficient in terms of channel utilization and energy efficiency. Vitality utilization is overwhelming portion in any wireless sensor systems to be work on. These are numerous low energy utilization steering Conventions outlined and tried to save vitality of a WSN and eventually to extend lifetime of network. This work proposed the utilization of LEACH (Low Energy Adaptive Clustering Hierarchy) calculation to which guarantees a harmony between energy utilization and postponement to determine energy issue in WSNs. Bunch based various levelled directing conventions assume a fundamental function in diminishing the energy utilization of remote sensor organizations (WSNs). To accomplish good execution as far as diminishing the sensor energy utilization, the proposed IEE-LEACH represents the quantities of the ideal CHs and precludes the hubs that are nearer to the base station (BS) to participate in the bunch Arrangement. Moreover, the proposed IEE-LEACH utilizes another limit for choosing CHs among the sensor hubs, and utilizes single jump, multi-bounce, and mixture correspondences to additionally improve the energy productivity of the organizations. The reproduction results exhibit that, contrasted and some current steering conventions, the proposed convention significantly decreases the energy utilization of WSNs

**Key Words:** LEACH Protocol<sup>1</sup>, WSN<sup>2</sup>

## 1. INTRODUCTION

Basic test in far off frameworks is that radio connections are dependent upon transmission control, obscuring, and obstruction, which spoil the data movement execution. This test is exacerbated in far off sensor organizations (WSNs), where genuine imperativeness and resource limitations block the use of various progressed strategies that might be found in other far off systems. The essential, financially savvy arrangement dependent on the methodology of fiery package length control to push ahead the execution in these fluctuating conditions. A trade-off exists between the long for to lessen the header overhead by making pack immense, and the need to diminish bundle screw up rates (PER) inside the rambunctious

Channel by utilizing little package length. Existing methodologies commonly necessitate that a bunch of boundaries to be deliberately tuned with the end goal that it can all the more likely arrange the degree of stream seen by a specific information follow. Nevertheless, any settled

arrangement of boundaries won't adjust to the changing conditions since one boundary set doesn't fit.

An organization of organizations is called an internetwork, or just the web. It is the biggest organization in presence on this planet. The web massively interfaces all WANs and it can have association with LANs and Home organizations. Web utilizes TCP/IP convention suite and utilizes IP as its tending to convention. Present day, Web is broadly executed utilizing IPv4. In light of lack of address spaces, it is slowly relocating from IPv4 to IPv6. (WSN) is a correspondence stage, whatever can affect a couple of Data Correspondence features later on. Preceding now, WSN has been getting real investigation thought due to its different suitability in a couple of fields of human endeavour. WSNs depends upon a couple of minimal nonessential free devices called sensor centres to shape an association. The specific center points in WSN can recognize an atmosphere, measure the distinguished data, or send it to a central unit for planning through a far off association.

The regular interest for WSN keeps growing, going from military use to public, ground, and space use. WSN rose in view of the enhancements in the smaller than usual electromechanical arrangement (MEMS) development and in far off trades. WSNs have starting late become a fascinating field of investigation starting late; a WSN is contained a couple of sensor canters (distant) which partners with structure a sensor field and a sink. The major issues in the WSN are the enormous number of centers used, their low power rating, and their impediment to short division correspondence. These center points participate to accomplish information identifying, following, and transmission, making the far off sensors sensible for the checking of ordinary occasions and characteristic changes surveying traffic advancements, controlling security, and noticing military

These applications require a high trustworthiness of the sensor associations and to improve the immovable nature of sensor associations, progressing examinations have focused in on heterogeneous WSNs.

Experts have commonly accumulated sensor centers into bundles in bearing to achieve the purpose of association flexibility; each social affair has a gathering head (CH) who is picked by the people from a gathering or is pre-allotted by the association creator. Also, any sensor that is more



# **Design and Analysis of MIMO Dual Band Patch Antenna for 5G New Radio Applications in Mobile Terminals**

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**Abstract:** This paper presents a dual-band monopole antenna design with compact size for 5G communication under 6 GHz band frequency. The metallic monopole stub structure is used for miniaturization of antenna. It has a compact size of  $24\text{ mm} \times 14\text{ mm} \times 1.6\text{ mm}^3$ . The suggested antenna has been design on FR4 material with  $\epsilon_r = 4.4$  with 1.6 thickness. The L-shape monopole antenna is modified by adding semi-circular element in radiating structure of monopole to obtain dual-band resonance. The proposed antenna has 5G application in the bands of 2.5 GHz (2.34 GHz-2.62 GHz) and 3.6 GHz (3.20 GHz-5.20 GHz). The bandwidth of antenna getting 280MHz and 2300MHz at 2.5GHz and 3.6GHz respectively. VSWR is less than 1.06 for both the bands. The designed dual band monopole antenna covers 5G bands of 2.3-2.4GHz (n30/n40), 2.4-2.5GHz (n7/n38/n41/n90), and 3.2-5.2GHz (n77/n78/n80). This proposed dual band monopole antenna is suitable for 5G Communications.

**Index Terms - Monopole, Dual-band, Miniaturization, 5G and L shape.**

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## **I. Introduction**

The fifth generation (5G) communication has been widely discussed to provide high data-rate communications in the future. The design and testing of the 5G communication system huge on the understanding of the propagation channels [1], and a large body of channel measurements is thus required. Currently, 5G mobile systems are broadening their spectrum to support a high data rate. In the World Radio Communication Conference (WRC) in 2015, the 5G candidate frequency bands below 6 GHz have been widely discussed, and the following frequency ranges have been suggested: 470–694, 2300–2700, 3300–3800, and 4500–4990 MHz Among them, 2.5 GHz & 3.5 GHz has been widely considered, as it can be accepted for most of countries. Therefore this paper was focused on the propagation channel characterizations at 2.5/3.5 GHz bands. Previously, 2.5/3.5 GHz propagation channel has been studied mainly for the Wireless applications with limited bandwidth & large size [2-4] or the Broadband Fixed Wireless Access [5-6]. Few works has been conducted for the 5G wireless propagation channels.

A compact dual-band antenna is designed for 4.5GHz and 7.8GHz 5G and C-band applications and the antenna satisfied the -10dB impedance bandwidth is 64MHz (4.468GHz-4.532GHz) and 128MHz (7.736GHz-7.864GHz) [7]. Dual-band miniaturized planar inverted F-antenna is designed for WLAN and 5G applications which has been designed to operate in the WLAN (2.4GHz), Bluetooth (2.4GHz), LTE2500 (2.5GHz) and 5G communication (4.5GHz) [8]. Single band elliptical Microstrip patch antenna is designed at 3.5GHz for 5G with impedance bandwidth around 700MHz and size is 48 x 26 mm [9]. Rectangular Patch antenna at 4.5GHz for 5G with impedance bandwidth around 700MHz and size is 50 x 40 mm presented [10]. But all this antenna having low bandwidth and large size so with the improved bandwidth & compactness which has been taken as an objective for this research work.

In this paper, a compact dual-band monopole antenna is proposed. In presented antenna, two frequency bands has been covered 2.5 GHz and 3.5 GHz. A compact dual-band antenna with excellent impedance bandwidth is proposed.

## **II. Antenna Configuration**

The dimensions and geometry of the proposed dual band monopole antenna is shown in Fig. 2. The radiating L-shape element has been printed on top side of FR4 Substrate with  $\epsilon_r=4.4$  and thickness (h) is 1.6mm. Partial ground plane is used to obtain the desired bandwidth and radiation response. Antenna-1 (as shown in Fig.1.a) is optimized to operate at frequency 3.5 GHz. The Antenna-1 structure incorporates L-shaped radiating



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# A Review on Audible Sound Analysis based on State Clustering through Multiple Deep Neural Network Modeling

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**Abstract:-** Statistical parametric speech synthesis (SPSS) combines an acoustic model and a vocoder to render speech given a text. Typically decision tree-clustered context-dependent hidden Markov models (HMMs) are employed as the acoustic model, which represent a relationship between linguistic and acoustic features. Recently, artificial neural network-based acoustic models, such as deep neural networks, mixture density networks, and long short-term memory recurrent neural networks (LSTM-RNNs), showed significant improvements over the HMM-based approach. This project reviews the progress of acoustic modeling in SPSS from the HMM to the LSTM-RNN. Understanding sound is one of the basic tasks that our brain performs. This can be broadly classified into Speech and Non-Speech sounds. We have noise robust speech recognition systems in place but there is still no general purpose acoustic scene classifier which can enable a computer to listen and interpret everyday sounds and take actions based on those like humans do, like moving out of the way when we listen to a horn or hear a dog barking behind us

**Keywords:** SPSS, HMM, LSTM-RNNs

## 1. INTRODUCTION

The goal of text-to-speech (TTS) synthesis is to render a naturally sounding speech waveform given a text to be synthesized. Figure 1 outlines a human speech production process. A text (or concept) is first translated into movements of articulators and organs. Using air-flow from a lung, vocal source excitation signals containing periodic (by vocal cord vibration) and aperiodic (by turbulent noise) components are generated.

By filtering the source signals by time varying vocal tract transfer functions controlled by the articulators, their frequency characteristics are modulated. Finally, the filtered source signals are emitted. The aim of TTS is to mimic this process by computers in some way. Text-to-speech can be viewed as a sequence-to-sequence mapping problem; from a sequence of discrete symbols (text) to a real valued time series (waveform).

Typical TTS systems consist of text analysis and speech synthesis parts. The text analysis part includes a number of natural language processing (NLP) steps, such as word segmentation, text normalization, part-of-speech (POS) tagging, and grapheme-to-phoneme (G2P) conversion. This part performs a mapping from a sequence of discrete symbols to another sequence of discrete symbols (e.g., sequence of characters to sequence of words). The speech synthesis part performs mapping from a sequence of discrete symbols to real-valued time series.

It includes prosody prediction and speech waveform generation. The former and latter parts are often called "front-end" and "back-end" in TTS, respectively. Although both of them are important to achieve high-quality TTS systems, this paper focuses on the latter one. Statistical parametric speech synthesis (SPSS) is one of the major approaches in the back-end part. This approach uses an acoustic model to represent the relationship between linguistic and acoustic features and a vocoder to render a speech waveform given acoustic features. This approach offers various advantages over concatenative speech synthesis, which is another major approach in the text (concept) frequency transfer characteristics magnitude start-end fundamental frequency air flow Sound source voiced: pulse unvoiced: noise speech

Outline of speech production process. back-end part of TTS systems, such as small footprint and flexibility to change its voice characteristics However, the naturalness of the synthesized speech from SPSS is not as good as that of the best samples from concatenative speech synthesizers. Zen et al. reported three major factors that can degrade the naturalness quality of vocoder, accuracy of acoustic model, and effect of over smoothing. This paper addresses the accuracy of acoustic model. Although there have been many attempts to develop a more accurate acoustic model for SPSS, the hidden Markov model (HMM) is the most popular one. Statistical parametric speech synthesis with HMMs is known as HMM-based speech synthesis Inspired from the success in machine learning and automatic speech recognition, 5 different types of artificial neural network based acoustic models were proposed in 2013.

## **A Review: Effective Techniques for Hardware Modelling of Machine Learning Algorithms**

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### **ABSTRACT**

*Machine learning algorithms are complex to model on hardware. This is due to the fact that these algorithms require a lot of complex design systems, which are not easily synthesizable. Therefore, over the years, multiple researchers have developed various state-of-the-art techniques, each of them has certain distinct advantages over the others. In this text, we compare the different techniques for hardware modelling of different machine learning (ML) algorithms, and their hardware-level performance. This text will be useful for any researcher or system designer that needs to first evaluate the optimum techniques for ML design, and then inspired by this, they can further extend it and optimize the system's performance. Our evaluation is based on the 3 primary parameters of hardware design; i.e.; area, energy and delay. Any design technique that can find a balance between these 3 parameters can be termed as optimum. This work also recommends certain improvements for some of the techniques, which can be taken up for further research.*

**Keywords:** *Hardware, model, machine, learning, optimization*

### **INTRODUCTION**

Machine learning has become a forerunner in optimizing algorithms ranging from classification, process mapping, image processing, audio processing, etc. These operations require a series of complex tasks, that must be done with utmost accuracy in order to make the overall system accurate. As an example, the classification process, consists of the following steps Data gathering and pre-processing, wherein the data to be classified is gathered from different sensors and different datasets. The gathered data is pre-processed in order to convert it into a processing friendly format. Examples of pre-processing include, missing value removal, noise removal, etc.

Feature extraction & feature selection, in this step the gathered data is given for better numerical representation via feature

extraction. If the number of features exceed a given size, then feature selection unit is deployed that can optimize the feature vector. Features are extracted using wavelet transform Fourier transform, etc., while features are selected using variance-based methods, aggregation methods, etc.

Classifier design, which basically compares these features between training and testing sets. This comparison yields in the accuracy of the classifier. The aim of any classification algorithm design must be to optimize this accuracy value.

Post-processing operations include prediction, recommendation, etc. based on the application under test.

All these operations require design of multiple kinds of hardware units including but not limited to, ALUs, fuzzy circuits, comparators, shifters, accumulators, etc. A

## 3.2.1 Number of papers published per teacher in the Journals notified on UGC website during the year



### Design and Fabrication of Corn Peeling and Cutter Machine

Akhilesh Samudre, Akshay Thubrikar, Hemant Vaidya, Dr. R.K. Pohane (guidance)

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**Abstract** – There are many maize threshing techniques in India which are used in day to day life. Maize is world's largest resourceful seed crop. The techniques used to separate seed in old days are removing the leaf by hand or by chopping the corn by wooden rod. The main problems with these machines are that they are not affordable to farmers who are having less acreage farms and which they do not require these big threshing machines. Also, in this process the kernels were getting damaged and the rate of production was less. Many farmers in India are not affordable to use these machine system can be established these machine provides simple mechanical design. The existing machine of corn de-seeding in agriculture industry consist of separation of grains only. But for making the past of corn another machine is required which is not affordable for farmers.so in this concept by keeping these things in mind we design the new concept which consist of three operation like seed separation, seed paste and cob crushing in single assembly. In this concept there is no need of any extra attachment. The concept model of machine was made by using AutoCAD software and required calculation were made .After freezing concept, later it was converted into 3D model using CATIA-software.

The fabrication of model was done and test was conducted.

**Keywords** – corn, peeling, cutter, combo.

#### I. INTRODUCTION

1.in India, corn is one of the most important crop and it has a source of large number of industrial products beside its use as human food and animal feed. Corn is also versatile crop, allowing it to grow across a range of agro-ecological zones. Every part of corn can be used to produce a large variety of food and non-food products. India is presently is in need of technology in agriculture field the farmers need to do all the segregation processes manually which is hard task far as far them and also this increase the cost of final products. To overcome this problem of removing its outer sheath and de-husking the cobs this machine which is affordable by farmers has been developed. The machine is basically compromise of separate shelling chamber, collecting tray and motor (2HP). The arrangement of these parts is connected by belt and pulley mechanism.



Fig. 1. Actual fabricated model of corn peeling and cutter machine.

#### II. LITERATURE REVIEW

1. Anant J. Ghadi et al [1]: This paper focuses on various corn de-husking methods. The Aztecs and Mayans made processes to cook or grind the corn which is cultivated it in numerous verities throughout central and southern Mexico. Due to these processes the crop spread to rest of the world. In agriculture industry the existing methods of corn de-husking was done manually with help of hands or by using large machinery for deseeding. So methods are not effective for a developing economy countries where farmers have little money for investment like India.Hence there is need for innovative idea or product that is feasible, safe, cost effective and productive for the India farmers.
2. Anirudha G. Darudkar et al [2]: This paper focuses on lack of corn processing machine like corn Sheller is major problem of corn production. In short this paper describe about design of various components of corn Sheller machine. It involves the process of design different part of this shelling machine by considering forces and ergonomic factor of people. This project is mainly about generating a new concept of corn shell with simple mechanism to bring anywhere and easier to thresh corn. We are trying to make innovative idea in machine which is power

## Mechanical Monster's Application in Era of Agricultural Industry: A Review

Akshay Anjekar<sup>1\*</sup>, Vinay Chandra Jha<sup>2</sup>

### Abstract

*A role of Agriculture is so critical in the Indian economy. Over the last few decades, Indian agriculture has recorded good growth. Implementing done in this area. The multipurpose farming robot is a fundamental new ideas in this field is very important, although a lot of work has been done on agricultural machine for full yield. Weeding, sowing seeds and spraying pesticides is the conventional method in agriculture. In India, bullocks, horses, and buffalo are still used by many farmers for agricultural operations. This would not satisfy the need for agricultural energy needs, in comparison to other countries around the world. To reduce the man power we are employing this prototype and which will fulfil all requirements and problems in real life. India is a country focused on agriculture in which 70% of individuals rely on the results of farming. But if we observe that with population growth the farm is spread among the family and because of this, farmers in India kept only two acres of farm on average. Economically, farmers are still very poor because they are unable to afford tractors and other expensive machinery, so they use conventional farming methods. So, we are designing this machinery that will fulfil all this need and solve the problem of labor.*

**Keywords:** Agriculture, ploughing, water, fertilizer, farmers

### INTRODUCTION

The foundation of India is agriculture. Paddy and Wheat is one of the latest agricultural goals in which there are still not many researchers and producers involved. There are some issues facing this area, such as how to optimize costs, how to improve efficiency and how to reduce costs [1–5]. Two types of farm machinery are used in India, the manual method, and the mechanized type. The use of a hybrid interface between the power source and the work is involved in mechanization. Usually, this hybrid system converts motion, such as rotary to linear, or offers sufficient mechanical benefits such as velocity increase or decrease or leverage [6–12]. Machinery used in farming or other agriculture is agricultural machinery. Driven machinery has replaced many farm jobs carried out by manual labor or working animals such as oxen, horses, and mules in modern times. Many examples of the use of implements, such as the hoe and the plough, are found in the entire history of agriculture. A plough or plow is a farm tool for loosening or turning the soil before sowing seed or planting as shown in Figure 1. But since the Industrial Revolution, the ongoing integration of machines has allowed farming to

become much less labor-intensive. The greatest advantage of automation is that labor is saved. However, resources and materials are also saved, and efficiency, accuracy and precision are increased. The essential stages in the field of agriculture are seed feeding, pesticide sprinkling and crop cutting [13–15]. In agriculture, a sprayer is a piece of equipment that is used to apply herbicides, pesticides, and fertilizers on agricultural crops as shown in Figure 2. The production of multipurpose agricultural machinery would assist Indian farmers in rural areas and small farms. The cost of feeding seeds, sprinkling pesticides, and

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## Green Manufacturing Index Applicability, An Approach to Acquire Industrial Gain.

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**Abstract:** The paper focuses on the requirement of fitness of lean and green concept utilization in an industry. Manufacturing plays the most prominent role in the development of economy of any country. The base of green manufacturing is its preference for sustainability and economical benefits. The main agenda of Green Manufacturing deals with conserving natural wealth for future generation and recycling of material by improvements in production process, it traverse the estimation and involvement of its index .Green constitutes bionomical durability and includes various attributes such as recycling from scrap and waste, pollution of land water and air, usage of energy and prescription. Green Growth is the effective and proper utilization of resources available by nature, reduction of pollution and impact of environment and strong towards bad effects, focusing on global durability and endangered into profitable from efficient, clean and pliant growth. Green assembling is a framework that incorporates item and procedure configuration issues with issues of assembling, arranging and control in such a way as to recognize, measure, test and deal with the progression of natural waste with the objective of diminishing and eventually limiting ecological effect while likewise attempting to expand asset effectiveness. The primary target of this exploration work is meant to examine viability of Green assembling. The strategy has been planned by sub ordering the machining rehearses dependent on their impediments, financial and ecological effects on keep up an economical assembling standard for businesses. The proposed strategy would be pertinent to any assembling procedure in industry. The intension is to minimise the gap of involvement of lean and green approach to contribute crucially as regarding expandable manufacturing.

### 1. Introduction

Now a day's Power of flexibly request are the issues looked by assembling ventures. Significant number of decades numerous industrialists are continually consistently searching for an elective alternative to find some kind of harmony among activity and ecological execution. Additionally, the expansion in worldwide rivalry among the assembling business has driven the makers to extend and hotspot for elective approaches to improve another way to enhance green Manufacturing. For future advancement, it plays significant role. The interest of manufacturing would be expanded in future and



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## Generation of Electric Energy Converted Into Fuel Cell for Operating Grass Cutter Mechanism.

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**Abstract:** The research intends the need for an alternative source of energy based on fuel cell. The purpose of the work is to generate electricity from hydrogen fuel cell using H<sub>2</sub> gas. The stored energy in form of fuel cell can be further used to operate the automatic grass cutter. The hydrogen, oxygen fuel cell formed from electric energy storage can be obtained by combining aluminium and water. H<sub>2</sub> has the highest energy density from all common fuels by weight so that's why it can be one of the promising substitute energy sources. The hydrogen must be incorporated in a small, less heavy system so that unnecessary weight of the device should be avoided. For cutting the grass, manually handled devices are commonly used, efforts required are more. Also, the old grass cutters are getting obsolete and requires replacement by automatic one, where system will work for guidance and obstacle detection using battery as power source. In these days' problems like pollution, power cut problem etc. appearing. To deal with such trouble and the help of technology device can be made, which can do its function without stimulating any harmful exhaust, the project will be operated by generating an energy, which can perform operation by using the renewable source of energy like alternate hydrogen fuel. Hence an attempt has been made by combining aluminium and water into some usable form which can absolutely be an alternative for various power generating fuels.

### 1. Introduction

At the latest, a significant attentiveness can be seen towards fuel cell technology, as it can be one of the most eminent prime mover, also frequency of climate alterations and different environmental impacts, need for an alternative power sources have increased enormously. Less thermal processes, noiseless operating feature, less weight and relatively greater efficiency tends to make Proton exchange membrane fuel cell as a coming energy resource for stationary usage. The need for power is tremendously increasing due to high level technology incorporation. In addition to cut down the dependency on the fossil fuel and discover sources of power which should be environmental friendly, can results in extensive search for energy sources and alternative fuels and substitute findings. For the





## An Arrangement and Performance Analytics of Elements of Vibration Testing Machine for Taper Roller Bearing

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**Abstract:** The paper addresses the need for automation in production line. A detailed evaluation of various components required for converting a manual bearing vibration testing machine to an automatic one is carried out. Function and Description of each component is studied. The components include conveyor belts, laser Doppler vibro meter, pneumatic system, mechanical probe, timing and control sensors, speed control system, data analysis and storage unit. A method of selecting each component for automatic vibration testing machine is offered. Based on the structure of automated machine the initial set of alternate variants is defined and a formal model of automatic vibration testing machine is developed. Design of conveyor belt, linear drives, pneumatic system, isolation pad, PLC and HMI system is discussed below. Analysis of supporting structure of Vibration Testing Machine is done using ANSYS 18.1 and results are shown.

### 1. Introduction

The MVU 150A is capable to measure the bearing described above (except HUB-units) and even more. Additional to the standard axial loading unit, it can be equipped with a radial loading unit. For that also cylindrical roller bearings can be tested. The MVU works with vertical high-precision hydrodynamic testing spindle. The driving unit is mechanically separated from the machine frame for an optimum vibration isolation. The thrust test loads and the radial test loads are applied by using the pneumatic loading unit. The evaluation of the noise and the vibrations and the corresponding classification of the test pieces are also carried out via the measuring electronics. Normally the three standard frequency bands are measured, within these bands the tolerance limits are freely programmable and/or are available after calling the appropriate bearing type. Evaluation criteria according to customers' requirements are possible. Frequency spectrum and detailed analysis of the spectrum is also used to go into depth with the locations and causes of the bearing vibrations. The applicable measurement outcomes are documented and also statistically compressed via a printer. The



# No Suspension, No Differential 4 - WD Vehicle Analytics To Reduce Adverse Environmental Impacts.

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**Abstract**— As we all know that technology has immensely improvised , development is on its highest peak with some specific disadvantages, adversely affecting mainly three elements of nature i.e environmental aspect, social aspect and economical aspect. also, implementation of certain techniques has been made to reduce harmful effects. An attempt has been made for such a design which will definitely reduce the harmful emission, as we all know, Now days another area where the technological improvement is taking its hike is automotive sector .This can be viable by creation of new attributes .The National Karting competition is the one of the mode which give provision for doing innovations for Participants. The Go-kart definition itself indicates that it is suspensionless with no differential. They are usually raced on scaled down tracks, but are sometimes driven as entertainment or as a hobby by non-professionals. This research deals with the Design and Analysis of Chassis for the Go Kart. In this, Car the chassis is most prominent component. It forms the main structure and the main frame of the vehicle on which other parts like Engine, Steering, and Transmission are mounted.

**Keywords**- Kart Design, Chassis, Materials, Model, Catia-V5, Finite Element Method.

## I. INTRODUCTION

A Go kart is a racing vehicle defined and designed with no suspension and no differential in it. The Automobile is a type of open wheel car. Kartings come in all kinds and variety, from motor less models to high-powered machine. Some of super kart are also able to beat racing cars or motorcycles on long circuits. These can be also powered with four stroke engine or batteries, while simple racing karts use a two-stroke engine rarely, sometimes higher powered four-stroke engines are also used. Most of them are designed with only driver seating purpose since it is basically used for contest purpose . Besides traditional aspect, many commercial enterprises offer the vehicle for rent, often called "recreational" or "concession" karts.

Also some recreational models can accommodate passenger too. The tracks can be indoor or outdoor. Karts are rented by sessions usually from 10 to 30 minutes. They use sturdy chassis complete with dedicated bodywork, providing safety of driver. Most of these enterprises use an "Arrive and Drive" format which provides customers with all the safety gear i.e helmets, gloves and driver outfits necessary, and allow them to show up anytime to race at a reasonable price, without the problem of having to own their own equipment and gear.

The power to a go-kart can be given by a four stroke, two stroke engine or by a electric motor 4S engines can be standard air-cooled industrial based engines, sometimes with small modifications, developing from about 5 to 20 hp (4 to 15 kW). Kohler, Robin, and are manufacturers of such engines. They are adequate for

# Detection of an Explosive Material In Landmine, Aqueous And Air Medium Through Sensor Operated Unmanned Guided Vehicle

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**Abstract:** Various explosives and harmful materials are most dangerous for human beings; detection of such materials is growing concern with curiosity as well. This paper identifies the broad array of possible mediums of explosions. As it is very difficult to find explosive material which is hidden, saving the life of an individual or whole from chemical explosion is need for the safety of our nation. The study focuses on detection of explosives which works on landmine, water and air. Searching for an explosive material manually is difficult task for any person; hence an attempt has been made to fulfil the necessity of need to design such equipment which will help researcher and engineers to find the explosive material to save lives. This work intends to design the unmanned vehicle i.e. drone which will work under ground, water and in an air with remote control. The sensors are used to find the hidden explosion in various medium. To detect non-contact type metal object, proximity sensor is used. A clarification of the crucial investigation for each approach is joined by its overall appropriateness to the pertinent the relevant scientific findings.

## 1. Introduction

Terrorism is of the major concern in the world, because of the terrorist one cannot live their life with full of freedom and also in the communal zones or places there is fear to have any explosive in that areas and the bomb squad cannot reach to the explosive on time [2]. Inductive proximity sensors issued to find out metallic objects which are not contacted physically. Active principle is based on a coil and oscillator that generates an electromagnetic field in the nearby areas of the detecting surface. The existence of a metallic thing (actuator) in the functioning area causes a stifling of fluctuation generosity. The increase or tumble of such oscillation is predictable by a threshold circuit which vagaries the output of the sensor. The modules are selected from the variety of brushless motors, battery technologies and cell arrangements, and static area propellers appropriate to use in a four rotor suspended vehicle.

A quad copter is a floating vehicle where four rotors are used for lift, steering, and steadiness. Like other in-flight vehicles, a quad copter can attain upright flight in more steady form. There is no effect



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## Design & Validation of Feeding Mechanism for Porous Raw Material: A Case Study in Chemical Processing Company

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**Abstract.** With the growing revolution in technology, quality is always being considered a major point of concern and developing countries like India where number of small and medium enterprises are working contributing for major part of employment, these quality concern need to be focussed. The present work involves the case study which has been conducted in one of small scale industry dealing with chemical processing, in Nagpur. The objective is to find out the solution for one of the problem discussed by production manager of the company. The problem is related to feeding of raw material into the processing plant which have been done manually and cause of quality issue and serious work hazard. So we have suggested a design of setup of feeding mechanism for pouring the raw material. While designing, first the survey has been conducted where it was found that different types of hoppers are available in market based in different size and shape. The hopper which we supposed to design should fulfil the requirement of the manager and all the technicalities. In order to do so we have studies number of design parameter and formulate the design procedure for each and every aspect right from calculation of mass flow rate, hopper angle, exit rate, wall friction angle, design of bevel gear, different force acting on hopper surface. The design of the hopper and the complete setup for the pouring resin is carried out by considering only porous raw material. So, comprehensive approach for designing the hopper as a solution have been done and proposed to company. Similarly the design is being validated using ANSYS software package.

### 1. Introduction

The case company named, RSA Industries Pvt. Ltd. Is located in, M.I.D.C. Hingna industrial estate, Nagpur-440028, who deals with production of chemicals used in textile industries. The products are water soluble polyester resin, carboxylate polyester resin for powder paint, low molecular weight water soluble polyesters and fatty acid esters and surfactant formulations. The company is having total 70+employees including R&D team, having turnover of 36 crores per annum. As discussed with production manager the company presently facing with the issue of increased work processing time and work hazard for which, as a solution the company want a well-designed hopper for pouring the resin into the processing plant of chemical i.e chemical reactor.

Designing a hopper involve number of decision parameter right from material properties to peat, rock, flour—no matter which material you process, the proposed hopper should move it to the feeder at required flow rate with maintaining the quality of same.



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# Optimization of Operational Method to improve sustainable Energy Efficiency of Auxiliaries in a CFBC coal fired Boiler- Energy Audit of Existing System

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**Abstract**—The research paper provides details of the hot water heating system for power consumption such as feed pump, feed pump motor, control valves etc; also, details related to the test of the existing system power using the 3-element mode method to control the drum level. Includes details about the various energy test equipment used during the power test to measure the various parameters such as flow, head, power speed, temperature and vibration. This study was conducted with the help of 2 boiler and turbine engineers and 3 operators where there is an inch switch. During the study of the parameter various parameters were collected and specifications were collected and the calculation was based on brake strength and pressure separation. In order to calculate it is important that one situation is sometimes created under the circumstances of each task. In cases of full volume, the drum pressure is usually kg/cm<sup>2</sup> above the maximum pressure. This means that when the total smoke load maximum pressure is ninety kg/cm<sup>2</sup>, then the corresponding drum pressure will be 100 kg/cm<sup>2</sup>. Therefore, while competitive calculations always create the assurance that the pressure to feed the feed in an economic rest area or feed supply center is much greater than the high pressure of the boiler drum flexibility for safe operation.

**Keywords**-Energy audit, Boiler Feed pump, Boiler auxiliary, Differential pressure, Drum level control

## I. INTRODUCTION

The variability in the output produced caused the fluctuations of the boiler drum pressure thereby resulting in a variation of the pressure output at the BFP output. The separation pressure across the FRS was kept at the highest point i.e. at a distance of 25-30 kg/cm<sup>2</sup>. In order to properly maintain the drum level only DP 8-10 kg/cm<sup>2</sup> is sufficient, the rest is compensated by melting the control valve and therefore as the DP across the FRS is increased inappropriate power through BFP use. As a result, the pressure in the BFP store had to be adjusted manually with the operation of the scoop. As the constant monitoring made with the

