



### 3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years

#### Number of papers published in national/ international conference proceedings

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#### 2017-2018

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CSE /

# An Intelligent System for Thyroid Disease Classification and Diagnosis

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**Abstract**— Data mining Techniques play a vital role in healthcare organizations such as for decision making, diagnosing disease and giving better treatment to the patients. Thyroid gland plays a major role in maintaining the metabolism of human body. Data mining in health care industry provides a systematic use of the medical data. Thyroid diseases are most common today. Early changes in the thyroid gland will not affect the proper working of the gland. By the early identification of thyroid disorders, better treatment can be provided in the early stage thus can avoid thyroid replacement therapy and thyroid removal up to an extent. This paper proposes a method for the classification and diagnosis of thyroid disease that a user is suffering from along with disease description and healthy advices. Support Vector Machine is used for classification. To optimize SVM parameters Particle Swarm Optimization is applied. User is provided with a window to enter the details such as the values of TSH, T3, T4 etc. There may be some values missing while the user entering the values. K-Nearest Neighbor algorithm is used for approximating the missing values in the user input.

**Keywords**—data mining; thyroid disease; support vector machine; particle swarm optimization

## I. INTRODUCTION

Data mining is the process of extracting large amount of data to identify and analyze data patterns. Data mining techniques can be used for discovering knowledge from large data base or knowledge base. So these techniques can help for extracting medical data patterns. This may help for analyzing the survivability of diseases. Medical data mining helps healthcare management, treatment effectiveness and patient involvement and relationships. Today thyroid disorders are common and are widespread worldwide. Thyroid has both structural and functional aspects. Thyroid is a butterfly-shaped gland which is located in the front of the neck. The hormone produced by thyroid gland plays a vital role in controlling human body system. The primary hormone produced by thyroid is Thyroxine (T4). A small portion of T4 is released from gland after releasing thyroxine to the blood stream and it is called triiodothyronine. Production of these hormones is controlled by TSH (Thyroid Stimulating Hormone), the hormone produced by pituitary gland. When T3 and T4 are more in the bloodstream, then pituitary gland releases less

TSH and when they are less in the bloodstream, pituitary releases more TSH. Both the increase and decrease in thyroid hormone production may lead to health problems. Thyroid disease can either affects the function of the thyroid gland or can be a tumor. These abnormalities are caused by two reasons: production of too little thyroid hormone or production of too much thyroid hormone. Hyperthyroidism causes sudden weight loss, irregular heartbeats etc. Hypothyroidism causes thinning hair, heart attack etc. Goitre is another thyroid disorder that enlarges the thyroid gland. Early changes in the structural and functional aspects of the thyroid gland will not affect the proper working of the thyroid gland. So there is a frequent misunderstanding or misdiagnosing of the thyroid disorders. Thyroid disease classification by interpreting the values of the hormones is an important classification problem. Thyroid diseases are usually diagnosed by taking the values of TSH, T3, and T4 from the blood. This paper proposes a method for the classification and diagnosis of thyroid disorders using Weighted Support Vector Machine along with Particle Swarm Optimization to optimize SVM parameters.

## II. LITERATURE SURVEY

K. Geetha and Capt. S. Santhosh Baboo in [3] have proposed a method to classify two major type of thyroid disease: Hyperthyroidism and Hypothyroidism. In the pre-processing stage, missing values and not a number constraint are checked and missing values are filled by taking the mean value of the corresponding column. Then child subsets are created from the parent records using differential evolution algorithm. Subset of data is then applied to Kernel Based Bayesian Classification algorithm. Feature selection is performed using wrapper model. Here, the disease is classified into only two classes.

Jameel Ahmed and M. Abdul Rehman Soomrani in [1] have proposed a framework for diagnosing the thyroid disease type. The first phase is data pre-processing in which missing values in the dataset are filled using Medical Data Cleaning (MDC). Second phase is classification. Two SVM classifiers are used here. First one is the multi-SVM used for predicting the thyroid disease type ie, Euthyroid, Hypothyroid, Sub-clinical hypothyroid and Sub-clinical Hyperthyroid.

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# A Novel Approach for Diagnosing Alzheimer's Disease Using SVM

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**Abstract**— Alzheimer's disease (AD) is one of the most intensifying brain disorder that gradually damage memory and thinking skills and later the ability to carry out the normal tasks. It is the most common cause of dementia in older adults. While dementia is more common as people grow older, it is not a normal part of aging. One of the first signs of Alzheimer's disease is memory loss. AD accounts for up to 80% of cases of dementia. The 3 stages of AD is mild, moderate and severe AD. In mild cognitive impairment (MCI), the loss of cognitive skills only slightly affects a person's daily life, moderate stage is the middle stage of AD. While in severe AD, a person is no longer able to function independently and becomes totally reliant on others for care. In this paper, Support Vector Machine (SVM) is used for diagnosing Alzheimer's disease of brain MRI and for classifying it into specific stages. The algorithm was trained and tested using the MRI data from Alzheimer's Disease Neuroimaging Initiative (ADNI). The data used include the MRI scanning of about 70 AD patients and 30 normal controls.

**Keywords**—Alzheimer's Disease (AD); Mild Cognitive Impairment (MCI); Support Vector Machines (SVM); brain MRI; Alzheimer's Disease Neuroimaging Initiative (ADNI).

## I. INTRODUCTION

Alzheimer's disease is an inevitable syndrome on our brain that effect in memory loss, reduced our thinking capability and other physical ability. It seems from the age of 60. Person having down syndrome generally nurture AD at the age of 30 to 50. Every four seconds someone is diagnosed with the Alzheimer's disease (AD). Alzheimer's is one of the most prominent diseases that affect nowadays. It is the most common cause of dementia affecting over 50 million people worldwide and yet finding the correct cure method is something difficult task today. Symptoms usually flourish slowly and get severe over time. Becoming severe, it will affect the daily tasks of a person. Dementia describes a cluster of symptoms that are caused by disorders affecting the brain. There are more than 47 million people worldwide with dementia today and 132 million predicted by 2050 [9]. There are many types of dementia and AD is one of the most common ones. Although several efforts have been made to resolve this type of dementia and develop effective treatments, decisive diagnosis is most difficult. Inquiring an effective way of diagnosing AD, some computer-aided systems have been investigated to diagnose AD. Thus systems based on Machine

Learning (ML) using brain MRI including structural MRI (sMRI) are used. The symptoms of AD will result in the changes in brain structure. AD turn off each and every neuron gradually. From this situation our brain stops functioning. It will turn towards the stage of memory loss, daily activities should be vanished from our memory.

The major parts of brain are limbic system, cerebral cortex, brain stem. The AD effects in these regions of brain. Limbic system impairs person's memory. Cerebral cortex affects the emotional behavior of a person. Damages caused in brain stem will effects the functions of entire body. The structural MRI is used to define the shape of the brain. It defines the Cerebral White Matter, Grey Matter and Cerebrospinal Fluid (CSF) dimensions. Based on functional MRI it defines the functioning of the brain based on the Blood Oxygen Level Dependent (BOLD) signal activation. Data set are collected from Alzheimer's Disease Neuroimaging Initiative (ADNI) [8]. There are several methods used for diagnosing AD.

The proposed methods is about to diagnosing AD using Support Vector Machine (SVM) by taking MRI as input and classify it into AD or normal. SURF point extraction is used for extracting the feature points of the image. Speeded Up Robust Features (SURF) it is a native point extractor used here for extracting the particular points of image. Gray Level Co-Occurrence Matrix (GLCM) is used for feature extraction.

## II. RELATED WORKS

M. Liu, R. Min, Y. Gao, D. Zhang, D. Shen [6] proposed a multitemplate based multiview learning for AD diagnosis. A relationship-induced multitemplate learning (RIML) method is proposed in it. And it contains three main steps, (i) feature extraction, (ii) feature selection, and (iii) ensemble classification. Initially, input brain MRI is used as an input image and it then undergoes multitemplate feature extraction. For each selected multiple templates of the same brain MRI, the tissue density map with grey matter is extracted. The RIML method [6] is applied to reduce the features from original features and thus selected wanted features. The selected features then undergo classification based on Support Vector Machine (SVM) and detect whether the patient is of AD controlled or normal controlled one with an accuracy of 93.06%.

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# *An Artificial Intelligence Approach for Predicting Different Types of Stroke*

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**Abstract:** Stroke is a second leading cause of death and they have been serious, long-term incapacity. Stroke is the sudden demise of cerebrum cells because of a nonattendance of oxygen, caused by blockage of bloodstream or break of a supply route to the mind. According to World Health Organization in the upcoming year's stroke will continue growth death rate. The many works have been carried out for detecting stroke diseases .An artificial intelligence approach for predicting stroke and its types using deep learning. Types are Ischemic stroke, Hemorrhagic Stroke, Transient Ischemic Attack .In our work, dataset collection from the medical institute. The preprocessing method expels copy records, missing information, and conflicting information. Principle component analysis algorithm is computation is used for reducing the estimations and deep learning utilizing predicts whether the patient is encountering stroke illness or not. So as to foresee the stroke illness, it actualizes classification by deep learning. When the patient details are entered, it checks with trained model and forecasting of different types of stroke .It this work mainly focuses better way for predicting stroke and different type of stroke.

**Keywords—** *artificial intelligence, artificial neural network, back propagation algorithm*

## I. INTRODUCTION

Stroke is a third imperative purpose of death and long-term incapacity. Stroke is a mind assault and it transpires at any

time.it happens a coagulation in veins or break of blood compartments. As indicated by world health organization stroke will keep on increasing demise rate in coming years, so earnest condition treatment must be quick as could be expected under the circumstances. Consistently a million individuals overall endure a stroke. Inability incorporates confront deformity, loss of vision, loss of motion, and discourse. Stroke is a significant unsafe ailment which hurts the cerebrum, like heart strike which hurts the heart. It doesn't circle blood and enough oxygen to the brain cells. Everyone overcomes with some stroke peril. The stroke may cause loss of movement, sudden torment in the chest, talk inability, loss of memory and thinking limit, daze like state, or passing. Stroke impacts the person of all ages. It can be balanced through the helpful control and modifiable risk factors are essential. The report says the most surely understood remedial error happens in light of expiry of meds, off kilter medicines, misguided estimations and treatment given to the wrong patient.

Stroke for the most part three composers:

- Ischemic stroke
- Hemorrhagic stroke

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# Design of a Trusted Third Party Key Exchange Protocol for Secure Internet of Things (IoT)

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**Abstract**— IoT incorporates a system of physical objects that are interconnected to exchange and collect data over the internet. The services provided by IoT, though improves the standard of our lives, have major challenges on securing networks and data in transmission because of the innumerable devices and services that are associated with it. Securing data is essential and it must not be seen as an afterthought. This paper proposes a secure Trusted-third-party based key exchange protocol (STKEP) for data communication in Internet of Things (IOT). This work employs an elliptic curve cryptographic method for encryption process. A session key is used to encrypt the data which is transmitted between the communication parties with the help of a trusted third party.

**Keywords**— IoT; key generation; security; trusted-third-party;

## I. INTRODUCTION

Security in IoT is concerned with protecting connected devices and networks in the Internet of things (IoT). Internet of Things consists of collection of objects or entities having unique identifiers that are interconnected to transfer data on the network. Smart home, smart energy grids, smart health, education, and agriculture, or wherever computing devices and sensors used are applications of IoT. The motive is to integrate computer-based systems and the physical world for economic benefit and to improve accuracy and efficiency while reducing human involvement. However, IoT has an enormous threat to security and privacy due to its vulnerable and error prone transmission medium, changing network topology, and untrustworthiness in IoT data. Moreover, the IoT devices may be compromised by attackers to intentionally generate fake data. Therefore, an efficient mechanism is extremely required to secure the devices connected to the internet against hackers and intruders.

The necessary security services [5] required in IoT is as follows:

### A. Confidentiality

The data stored inside an IoT device or that flows between

the source and destination needs to be protected from unauthorized entities. Because they can be easily hacked by an attacker and the secret information can be retrieved. This can be achieved through encryption/decryption.

### B. Data Integrity

Data integrity ensures the consistency of data so that no intruder can change or modify the message.

### C. Authentication

The communicating nodes make sure that they are communicating with the genuine or real individuals and thereby verify the identities of each other.

### D. Availability

The data and services needs to be available all the time whenever required.

### E. Replay Protection

Duplicate or replayed messages needs to be detected. They can be avoided through the use of timestamps, sequence numbers, nonce, etc.

STKEP is a multi-key exchange mechanism which is based on a trusted third party for secure data communication [1]. The third party which is not similar to any certificate issuing authority authenticates the communication entities and the messages transmitted between them. The drawback with the certificate authorities is that they take more time for authentication and requires more bandwidth in order to verify the certificates.

In the public key framework the benefit of asymmetric cryptography is used to load the pairwise key of two nodes over the communication channel. To generate the pairwise secret key and its associated values like initialization vectors, the corresponding nodes have to interchange their public keys and some information [6]. The communicating parties will be authenticated when the public keys are certified by a trusted third party.

Elliptic curve cryptography (ECC) which is data encryption technique is used in the proposed architecture

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# Ensemble Approach for Predicting Genetic Disease through Case-Control Study

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**Abstract**— The origin of many diseases can be revealed by knowing the gene regulation. Genetic disease an abnormality in individual's genome. These abnormalities can be occurred due to mutation in single base in DNA or due to the involvement in the addition or subtraction of entire chromosomes. To measure the expression levels of bulk of genes simultaneously, DNA microarrays are used. Microarray data is set of DNA sequences representing the entire set of genes of an organism, arranged in a grid pattern so that the expression of thousands of genes can be detected at the same time. In this paper we propose an approach for diagnosing genetic disease, to accomplish this goal we need to select the most informative ones that can accurately distinguish one class of genes from another. For that the genes with high significance are iteratively extracted. The goal of this paper is to develop method, which increases the classification accuracy, for identifying significant differentially expressed clusters of genes using Recursive Cluster Elimination (RCE) that is based on an ensemble clustering approach.

**Keywords**- genetic disease; microarray data; clustering; bioinformatics; genomics; machine learning; DNA; support vector machine; recursive cluster elimination; gene selection.

## I. INTRODUCTION

In the past decade, bioinformatics has been a fast-growing research field due to the advent of DNA microarrays technology. Bioinformatics strives to determine what information is biologically significant to decipher how it is precisely used to control the chemical environment within living organisms. In the field of bioinformatics, Genomics deals with the entire set of genetic material within an organism. In human genetics, it is difficult to determine the DNA sequences that cause specific traits in the intact organism [1]. A genetic disease is a genetic problem which is caused by one or more abnormalities in the genome, especially it is a condition that is present by birth. In the human genome probably, there are 19,000-20,000 human protein-coding genes. It would be great if it is possible to study many genes at same time and also to analyze every gene in a single experiment. DNA microarray is one of the rapid growing technologies in the field of genetic research. A DNA microarray is a collection of microscopic DNA spots, which is attached to a solid surface. Scientists use these microarray data to monitor the expression levels of genes simultaneously. Microarray data is usually of very huge in dimensions with a small number of samples. Due to this it very difficult for existing classification algorithms to analyze

this type of microarray data. In addition to that microarray data contain a high level of noise, irrelevant and redundant data. All these account to unreliable and low accuracy analysis results. In order to avoid high computational complexity, needs to select most suitable differentially expressed genes to explain genetic disease. Mainly, there are three approaches have been proposed for gene selection. Filter methods achieve selection of genes which is independent of the classification model. They rely on a criterion that only depends on the data to assess the significance or relevance of each gene for class discrimination. A relevance scoring algorithm rank the genes from which the top-ranking genes are generally selected as the most relevant genes. Many filter methods ignore the correlations between genes since they are univariate and provide gene subsets that may have redundant information. In recent years, filter methods have become increasingly popular as these methods removes non-significant data before classification. One of the most popular filter gene selection methods is that ranking which is applied to cancer classification. Within the ranking, a Signal-to-Noise ratio method for gene selection and a correlation coefficient method were applied. Wrapper approaches perform gene subset selection in interaction with a classifier. The aim is to find a gene subset that accomplish the best prediction performance for a particular learning model. In order to explore the space of gene subsets, a search algorithm is wrapped around the classification model. This is used as a black box to assess the predictive quality of the candidate solution. These methods are computationally intensive, since a classifier is built for each candidate subset. Embedded methods are similar to wrapper methods in the sense that it searches for an optimal subset through specific learning algorithm. But they are characterized by a deeper interaction between and classifier construction and gene selection. The combination of filter and wrapper methods [2] enhances the accuracy and performance of microarray gene expression classification. The remainder of this paper is organized as: Second section provides a brief overview about genetic disease and its types. Recent approaches for the prediction of genetic disease are described in the third section. The proposed system is explained in section 4. Section 5 includes the results that are obtained from the proposed work. Finally, conclusions are provided in the section 6.

  
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# A Novel Method of Object Identification and Tagging Using Speeded-Up Robust Feature

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**Abstract**— The one thing that is gradually increasing in the world is data. They are pieces of information's and knowledge and are measured, collected, reported and analyzed. Data can be visualized using graphs, images or any other analytic tools. The visual complexity of image data is large when compared to the text data. Image data could be transformed into useful information's if people could analyze them properly. Image mining is a special category under the field of data mining where new patterns and relationships are extracted from the pre-existing database. There exist different image mining techniques that are used to identify images that contain potential objects. Embedded details in the image could be extracted using low level features such as color, shape and texture that are invariant to any changes associated with that particular image. This paper aims at introducing a method to identify potential objects from images based on high level feature extraction. Key points are extracted from the images using Speeded-Up Robust Feature (SURF) and objects are identified and tagged. The proposed method aiming at widening the possibilities of object identification and tagging.

**Keywords**— Data, Object identification, Speeded-Up Robust Feature (SURF), Key points

## I. INTRODUCTION

Image mining is a technique that is used to organize the wide amount of image data. It is the process of generating new relationships and patterns from a large previously existing collection of image data. The process of searching and discovering valuable information's and knowledge in large volume of image data deals with Extraction of implicit knowledge, Identifying image data relationships and discovering other patterns that are not explicitly stored in image. The visual content in the image and other challenges such as illumination, noise, clutter, scale and occlusion makes it more complex compared to the text data. There exist several functions driven and information driven image mining techniques and are used to identify image that contain a potential object from massive collection of image data.

Content Based Image Retrieval (CBIR) is the application to the image retrieval problem. CBIR is the technique of searching image in the large database. The search is mainly deals with the content in the images. There exist several low level feature extracting characters such as color, shape, texture, entropy based on which the images are retrieved from a large collection of data. One thing that is gradually increasing in the world is data and it has to be organized properly for further applications. The visual complexity of image data is high when compared to the text data. As images are rich in information's and content, CBIR and image mining techniques based on low level feature extractions such as color, shape, and texture are used to organize them properly [1].

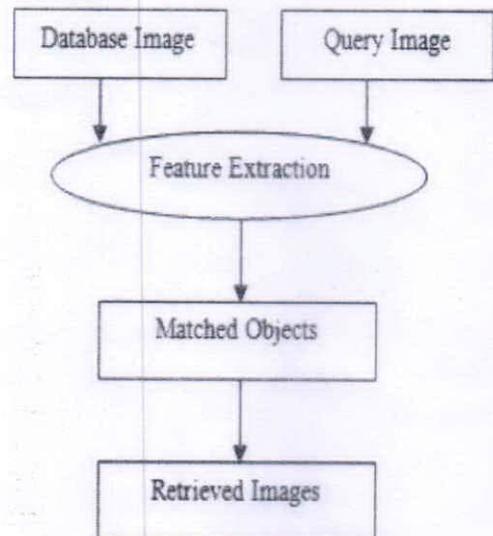


Fig.1.Content Based Image Retrieval Flow

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# Classification of WBC Using Deep Learning for Diagnosing Diseases

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**Abstract**— The blood test plays vital role in recognizing diseases. It gives the details about the general state of a person's wellbeing conditions. Based on data from blood test specialists, they choose the treatment for the patient required. White blood cells (WBC) are an important component of blood system. It is essential for good health and protection against disease. WBC contains fundamentally five parts and relies on its variety of size, count, shape. Based on variation in these features there can occur many diseases. Presently, we have confronted many issues in blood testing. One common issue is that a unique blood was getting an alternate and extraordinary estimation of cell check from the diverse lab technician. Most of the laboratory follows the manual counting technique, which is very tedious and less accurate. The proposed frameworks help to classification of each kind of white blood cells utilizing multi class support vector machine classification and convolutional neural networks (CNN). Identifying the Neutrophils, Lymphocytes, Monocytes, Eosinophil and Basophils variation can be identified using deep learning for diagnosis diseases. Likewise, discover the level of malignant cell in blood and leukocytes for different age domain.

**Keywords**— White blood cells (WBC), Red blood cells(RBC),Support vector Machine (SVM), Deep Learning (DL), convolutional neural networks (CNN).

## I. INTRODUCTION

Blood conveys imperative substance to all parts of the body, it is a transporting liquid. The white blood cell assumes imperative part in invulnerability of the body. The white blood cell is otherwise called leukocytes which are nucleated cell delivered from bone marrow [2]. The major duty of WBC is to fight infection and cancer.

Monocytes, neutrophils, basophils, eosinophil's, lymphocytes are essentially kinds of

leukocytes demonstrated fig1. Each kind of leukocyte has there on properties for ID like count, shape, morphological changes. When a person's counsel with specialist for check-up or illness concern you have, your specialist may approach significant data from your blood test [2]. About 90 percentage of the information in the average medical chart comes from laboratory data. In the event of growths and different dangerous diseases, blood tests give supportive indications about how the body is functioning. To recognizing the infections take more significance of blood testing is justifiably critical. Specialists look at the complete blood count for high or low counts of different blood cells and also for abnormal blood cells [2]. For recognizable proof of illnesses most ordinarily utilized two systems, they are add up to WBC count and check of each kind of WBC, which is known as differential count or diff test. WBC count can be ascertained by utilizing manual technique and laser based cytometer.

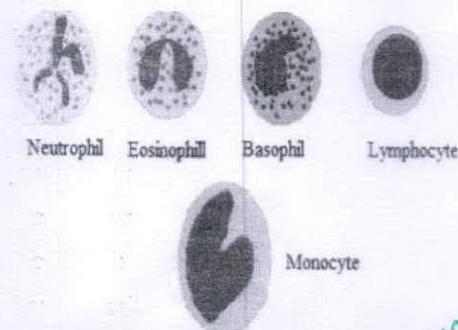


Fig:1 Type of White blood cells

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# An Intelligent System for Early Assessment and Classification of Brain Tumor

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**Abstract**— Data mining is a best technique in many fields and it has wide application in healthcare industry such as identifying healthcare patterns from large medical datasets, decision making, and providing early stage treatment to the patients. We can use data mining techniques to detect disease like brain tumor. Brain tumor is the abnormal growth of brain cell and it is one of the dangerous causes of death among people. Early stage tumor diagnosis is possible by a brain tumor detection system. This paper proposes an intelligent system for the diagnosis and classification of brain tumor disease that a user is suffering from along with disease description and healthy advice. The system works on a medical image dataset using data mining techniques. The proposed system comprises of four phases like pre-processing, segmentation, feature extraction and classification. The system identifies the type of tumor by Support Vector Machine. Here we can use genetic algorithm for optimizing the features and SVM parameter. Overall system works with brain MRI image and the usage of data mining techniques in tumor detection system will provide high detection rate.

**Keywords**— brain mri; brain tumor; data mining; genetic algorithm; support vector machine.

## I. INTRODUCTION

Brain is a complex organ in human body. Brain disorders are most common today. Growth of abnormal cells in brain is known as brain tumor and it can be occurs in various types. Tumor can be occurs in any size at any location in the brain. The growth of abnormal cells in brain causes high pressure inside the skull and it make many dangerous health problems in our body. Benign tumors are non-cancerous tumor. But some tumors can be cancerous (malignant) and it is difficult to diagnose and the chances of survival is least. The cost of treatment of brain tumor is not affordable by most of the patients.

The treatment of brain tumor is based on the size of the tumor, type of the tumor, and the growth stage of tumor. In healthcare industry doctors detect the presence of brain tumor with the help of various medical imaging techniques such as MRI (Magnetic Resonance Imaging) scanning, CT (Computed Tomography) scanning etc. They need to give more attention in addressing severe brain diseases. For better decision making medical industry started using data mining techniques to detect the presence of such sort of diseases. Doctors can use

a brain tumor detection system as a second opinion for the diagnosis and the treatment of brain tumor. This paper proposes an intelligent system for the early stage diagnosis and classification of brain tumor using Optimized Support Vector Machine (SVM) along with Genetic Algorithm (GA) to optimize the features. The system also finds the growth stage of tumor and provides healthy advices to the patients.

## II. LITERATURE SURVEY

Eman Abdel- Maksoud et al. in [4] have proposed a system for early detection of brain tumor with image segmentation technique. The system uses a K-means clustering technique integrated with Fuzzy C means algorithm for brain MRI segmentation. They use two further segmentation such as threshold and level set segmentation to make an accurate brain tumor diagnosis. The system provides improved accuracy in various datasets.

B.V.Kiranmayee et al. in [2] have proposed another method for the diagnosis and classification of brain tumor. They use decision tree approach for the classifying dataset in to normal image and abnormal image. The system consists of both training and testing part. Both parts consist of pre-processing, segmentation and feature extraction. They use ID3 as the decision tree and MATLAB tool for pre-processing and building the decision.

Tamer Hosny et al. in [1] have proposed a hybrid system for detecting the presence of tumor. The system consist of three stages such as feature extraction using discrete wavelet transform, dimensionality reduction using principal component analysis and classification with hybrid classifier includes K-nearest neighbor and feed forward back propagation artificial neural network.

Malathi R et al. in [3] have proposed tumor segmentation method using k-means clustering. System consists of two stages pre-processing and segmentation. Pre-processing includes to gray scale image conversion, noise reduction by median filter and sharpening of image using Gaussian filtering mask. Then clustering is performed on enhanced MRI images for the detection of tumor.

Pallavi Bhosale et al. in [7] proposed a framework for the diagnosis of brain tumor. Frist phase is image pre-processing. Second phase is image segmentation using K-means clustering

# Design and Comparative Analysis of Mobile Computing Software Framework

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**Abstract**— Mobile computing is human - computer cooperation by which a computer is relied upon to be transported amid typical use, which considers transmission of information, voice and video. Mobile computing includes mobile hardware and mobile software. Hardware incorporates mobile gadgets or gadget segments. Mobile software manages the attributes and necessities of mobile applications. These hardware and software parts integrates into operating system. Each cell phones keep running on some sort of Operating System. The Operating System could possibly get refreshes from the producer. Mobile operating systems play out an extensive arrangement of errands which are typically chosen by the seller building up the product. Our undertaking points is to plan an OS which will decrease the symptoms of having unnecessary forms working in the back ground over which clients would for the most part have no control. TOn the off chance that we prevail with our target of building up a completely free advanced android OS, it would help us to figure out which bundles ought to be permitted to be introduced to the cell phone. It would likewise help us to remain furiously autonomous to the extent programming assets related with mobile phones are considered. Thus mobile computing challenges can be solved to a great extend.

**Keywords** -Operating system, Custom ROM, Smart phones, Lineage OS

## I. INTRODUCTION

A mobile computing software is intended to be utilized with a specific kind of computing gadget. Clients are prescribed to check the similarity of the software before settling on the buy choice. They likewise have the choice to download freeware from the Internet or request altered the software to suit particular operational or expert needs. A smartphone

is a mobile phone based on a mobile working system, with further developed processing capability and network than an element phone. Many types of mobile computers have been introduced since the 1990s and one of it is mobile phones. Operating system is characterized as the framework programming that oversees equipment and programming assets and furthermore gives basic administrations to PC programs. It additionally guarantees that diverse projects running in the meantime don't meddle with each other. It is dependable for the administration of memory and for correspondence inside the device. Operating framework might be stretched out to include extra complexity. The decision of OS will compel or empower the usefulness of the end gadget in two key regards; The primary aspect is the fact conceivable with any given OS and secondary that which is available. It go about as a product stage over which other application projects can run. Aside from this, OS likewise gives a predictable interface to applications, paying little respect to the equipment it is stacked on. Correspondence between the OS and the applications are done through an API (Application Program Interface) which enables a software developer to compose an application for one

# Performance Analysis of Various Combination Sorting Algorithms for Large Dataset to fit to a Multi-Core Architecture

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**Abstract**—A data structure is a specific and systematic way of storing and organizing data in a computer so that it can be accessed and revised efficiently. More precisely, a data structure is a collection of data values, the relationships among them, and the functions or operations that can be applied to the data. An algorithm is a finite sequence of steps for solving a problem. All sorting algorithms apply to specific kind of problems. Some sorting algorithms apply to less number of elements, and others for large number of data. Likewise, some sorting algorithm are used for data with duplicate values and some are for floating point numbers. The increasing computation power in modern computers in the form of several cores per processor and more processors, makes it necessary to rethink or to redesign sequential algorithms and data structures. In this paper we introduce 3 new modified algorithms. They are Ins-merge, Quick-merge and Binary Search Tree with duplicate keys (BSTD). The goal of this paper is to develop modified algorithms for sorting on large data and to define an 'n' which can be an absolute value or a function of total number of elements in data set and to make it fit into a multi-core processor to improve the computational performance.

**Keywords**— data structures, sorting, algorithm, multi-core, high computation, insertion sort, quick sort, merge sort, binary search tree, ins-merge sort, quick-merge sort, link-merge sort, time-complexity, space-complexity.

## I. INTRODUCTION (HEADING 1)

Sorting is a common issue in the field of computer science. There are a number of well known sorting techniques or algorithms created for sequential execution on a single processor. Till now many sorting algorithms have been developed with different properties for different architectures. Let  $A = (a_1, a_2, a_3, \dots, a_n)$  be a sequence of  $n$  elements in unsorted manner, sorting transforms  $A$  into a increasing sequence  $A = (a_1, a_2, a_3, \dots, a_n)$ . Sorting can be of two types, internal sorting and external sorting [1].

Sorting algorithms can be classified as comparison-based as well as non-comparison-based. In comparison-based sorting algorithm the unordered data is sorted by comparing the pairs of data continuously and repeatedly, and if the data are out of order then swap them [2]. Non-comparison-based [3] sorting algorithms sort the data by using specific well known properties of the data, such as the binary representation or data distribution. Performance of sorting algorithms are analyzed based on four parameters which are stability, adaptivity, time complexity, space complexity [4]. The complexity of all sorting algorithm mostly measures the running time as a general function of the total number of items to be sorted. Each sorting algorithm 'A' will be made up of the following operations, where  $A_1, A_2, \dots, A_{n-1}, A_n$  contain the items to be sorted and  $B$  is considered to be an auxiliary location.

- 1) Comparisons which test whether  $A_i > A_j$  or test whether  $A_i < B$ .
- 2) Interchanges which switch the contents of  $A_i$  and  $A_j$  or  $A_i$  and  $B$ .
- 3) Assignments which set  $B = A_i$  and then set  $A_j = B$  or  $A_j = A_i$ .

Generally the complexity function measures only the number of comparisons, since the number of other operations is at most a constant factor of the number of other operations. [5] A multi-core computer is defined as a computer having at least one central processing unit (CPU) with several cores. The core is the part of the processor that performs the execution of the instructions. On a single-core processor only one instruction can be processed at a given time while multi-core processors can execute several instructions. This is interesting because it allows computers with only one CPU to be able to run parallel applications. The naming convention for describing how many cores a multi-core processor has, is done by prefixing with a word for the number of cores: dual-core, quad-core, octa-core, etc [6]. Every

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# A STANDALONE GENERATIVE CONVERSATIONAL INTERFACE USING DEEP LEARNING

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**Abstract**— Conversational agents is an intuitive agent that conduct by means of text and audio mode. In the modern era, conversational agents with generative based have fast notoriety in all areas. The development of conversational agents has opened up new space of the client engagement and better approaches for working together as conversational trade. It is a most valuable innovation that supplanting the customary models and making applications and sites inessential. The most fascinating element of the bots is that they gain from the past interactions and become more brilliant over the time. The working of conversational models is in two ways and they are rule based and smart machine based. Rule based models take after predefined rules to do tasks and smart machine-based models are self-learning and utilize machine learning to do work. Today generally all the developed generative conversational interfaces are utilizing deep learning. The principle objective of the proposed framework is to actualize a generative conversational interface by using deep learning. Furthermore, the suggested framework comes about on, the formation of responses based on the dynamic knowledge base and the current input in a closed domain.

**Keywords**—Conversational agents, Chatbots, Generative framework, Closed domain.

## I. INTRODUCTION

Conversational agents are the machine translation software program that lead discussion by means of textual and auditory mode. Chatbots mainly deals with two type of technologies. Initial one is the rule-based work, where the chatbot can utilize predefined rules and heuristics to carry out its activity. Another one is the smart machine-based work, where they

utilize machine learning to do function and can learn with their own. While arranging a framework for chatbot, we need to consider fundamentally two things – the inquiries should come either under open domain or closed domain and the response from the chatbot should come either under retrieval-based framework or generative based framework [5]. In closed domain there will be a predefined arrangement of questions on particular area and the open domain manages the questions that awning all areas. Obviously open domain is better when compared to closed domain with the fact that the client can take the discussion anywhere. Once a question is asked, the chatbot needs to produce responses. In retrieval-based framework, the chatbot contains predefined responses and the generative based framework doesn't have predefined response yet rather produce

Conversation	Open Domain	4	3
	Closed Domain	1	2
		Retrieval-Based Responses	Generative-Based Responses

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# DETECTING INSURANCE CLAIMS FRAUD USING MACHINE LEARNING TECHNIQUES

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**Abstract**— The insurance industries consist of more than thousand companies in worldwide. And collect more than one trillions of dollars premiums in each year. When a person or entity make false insurance claims in order to obtain compensation or benefits to which they are not entitled is known as an insurance fraud. The total cost of an insurance fraud is estimated to be more than forty billions of dollars. So detection of an insurance fraud is a challenging problem for the insurance industry. The traditional approach for fraud detection is based on developing heuristics around fraud indicator. The auto\vehicle insurance fraud is the most prominent type of insurance fraud, which can be done by fake accident claim. In this paper, focusing on detecting the auto\vehicle fraud by using, machine learning technique. Also, the performance will be compared by calculation of confusion matrix. This can help to calculate accuracy, precision, and recall.

**Keywords** –Machine learning (ML), Decision tree(DT), Random forest(RF), Naïve Bayes(NB).

## I. INTRODUCTION

The insurance industry is now embracing the effective fraud management. Some people cheat the companies for getting compensation, but others pay premiums. There are two major classifications for fraud, hard insurance fraud, and soft insurance fraud[1]. Hard insurance fraud is defined as when people intentionally fake an accident. When a person has a valid insurance claim but falsifies part of the claim is known as soft insurance fraud. If a company have good fraud detection and prevention

management system then increased customer satisfaction. According to the increased satisfaction, loss adjustment expenses will be reduced. Now there are many ways for detecting fraud claims. The most used method is analysis the data with its own instruction [1]. So they need complex and time consuming investigations, and it deals with the different domain of knowledge. By using machine learning technique overcome this entire problem.

## II. DESCRIPTION

The basic principle of machine learning is that, study and construction of a system that can learn from data. It is the building block to make computers learn to behave more intelligently. The techniques are divided into main four categories, depending upon how they working. They are supervised, unsupervised, semi-supervised, and reinforcement learning. Where the correct class of training data is known called as supervised learning, otherwise it is an unsupervised learning[2].Both mixes of supervised and unsupervised learning is known as semi-supervised learning. The reinforcement learning is defined as allow the machine or software agent to learn it's behavior based on feedback from the environment.

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# A NOVEL APPROACH FOR miRNA TARGET PREDICTION USING DEEP LEARNING

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**Abstract:** This paper presents a novel approach for miRNA target prediction using deep learning. Deep learning is branch of machine learning and it can apply in various areas not just related to computer science. The mix of machine learning and Bioinformatics is a striking one. This paper talks about another miRNA target prediction through deep learning. miRNAs diminish protein translation by binding to 3' UTR regions of target genes with imperfect complementary pairing. Here examined a deep learning approach for miRNA target prediction.

**Keywords—** miRNA , miRNA prediction, machine learning.

## I. INTRODUCTION

MicroRNA is a small noncoding RNA molecule, which are the 21nt noncoding RNA. It is predominantly found in plants, creatures and some infections that capacities in RNA silencing and post transcriptional control of gene expression. It comprises 21nt noncoding RNAs. The dysregulation drives illnesses and different conditions in an extensive variety of natural procedures. Cancer, heart illnesses, kidney sicknesses are a portion of the infections that are raise on account of the miRNA deregulation. So miRNA target prediction assumes a key part in natural field. miRNA targets speaks to a crucial advance so as to understand the microRNA activity and association toward cell functions. The journey of miRNA target prediction is developing stages. Presently miRNA target forecast has come to in the course of machine learning. Notwithstanding exploratory research and Methods, different machine learning approaches have been produced in the miRNA target prediction. svm, decision tree, naive bayes are a portion of the techniques. New methodologies are utilized for getting greatest flawlessness in this field. The machine learning also embarked miRNA target prediction

algorithms. The investigations are begun before; now target forecasts are traveled through the developing stage. There are few strategies and techniques produced for prediction of target miRNA. Precisely recognizing genuine miRNA focus from a huge number of candidate miRNA target duplexes remains a testing assignment.

## II. RELATED WORK

A portion of the machine learning approaches is presented for enhancing miRNA target prediction. For instance miREE[9] utilizes two classes Abintio technique and machine learning approaches. Abintio utilizes genetic-algorithms for forecast part. It have two modules mainly 1) miRNA module 2) mRNA module. miRNA module comprise duplex particular qualities and mRNA module consists ecological attributes for binding sites. Machine learning part is essentially utilized for the classification. Machine learning approaches comprise the SVM algorithm. The underneath Fig:1 explain the square graph of miREE.

Next strategy is the MiRTif[6]. This miRNA target sifting framework is support vector machine classifier. Here miRNA:target communication match is isolated in to two locale, seed and nonseed. For the data representation k-gram recurrence strategy is utilized. F-Score strategy is utilized for feature selection. After feature selection strategy it evacuates the non-enlightening features. At that point SVM is utilized for the classification. Third one is the NBmiRTar[7]. It utilizes naïve base classifier for foreseeing the miRNA target site. Here NB classifier reprocesses the miRanda yield. The channels are utilized for limit and diminish the forecasts. The dataset contains tentatively approved and falsely produced target locales. The Fig: 2 clarifies the working of NBmiR tool.

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# A NOVEL METHOD FOR BRAIN PROFICIENCY ANALYSIS BASED ON AUDIO TRACKING

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**Abstract**— The human brain has numerous abilities. It is a self-learning system that adapt itself to its environment and circumstances. Cognition has to do with how a person understands the world and acts in it. It is the set of mental abilities that are part of nearly every human action while we are awake. Cognitive abilities are brain based skills we need to carry out any task from the simplest to the most complex. They have more to do with the mechanism of how we learn, remember, problem-solve and pay attention rather than with any actual knowledge. One of the cognitive ability is attention-focusing skills, which are necessary to filter out distractions and prioritize received information to determine how much detail from a given sensory input is converted into memory. In this paper, the search is towards finding the brain ability by calculating concentration level of different aged people with mental stress and for mentally challenged too.

**Keywords**—Concentration level, Brain proficiency, Audio tracking, Mental stress, Mentally challenged.

## I. INTRODUCTION

The brain is the largest and complex organ in the human body. It is made up of more than thousand million nerves that communicate in trillions of connections called synapses. Our brain gives us the best awareness of ourselves and about environment which process a constant stream of sensory data. It controls our muscle movements breathing internal temperature and the functioning of glands. Every creative thought, feeling and planning is developed by our brain only. The brain's neurons records the memory of every event in our day to day life. In fact the human brain is so complicated and it remains an

exciting frontier in the study of zoology, doctors, psychologists and scientist are continuously researching to learn the brain analysis to create our powerful human mind. Our study includes search towards finding the brain ability by calculating concentration level of different aged people with mental stress and for mentally challenged too. Cognitive abilities are the brain based skills we need to carry any task from simpler to complex. By this study we are designing an approach for measuring the cognitive abilities through simple audio tracking method.

## II. DESCRIPTION

When we sit and consider as individuals, it is not the biological level that we end up at. Rather than our introspection takes to a different world, named as cognitions. Cognitive psychology includes attention, memory, intelligent, perception, thinking and so on. These are collectively seems to make the bunch of ideas from our experience of our lives. It represents in the field of cultural and social cognitive neuroscience, indicating the complimentary nature of social as well as biological level of analysis. Research that integrates these two levels can develop more meaningful theories to explain the mechanisms behind the complex behaviour of the mind.

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# ARTIFICIAL NEURAL NETWORK FOR DIAGNOSING AUTISM SPECTRUM DISORDER

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**Abstract—** Autism Spectrum Disorder (ASD) is one of the situations that will face on the early childhood. There are several methods existing in nowadays for diagnosis ASD. Diagnosing ASD using Structural and functional MRI of Brain. Structural and Functional MRI are taken from the ABIDE dataset. In order to turn towards the idea for diagnosing ASD by using Magnetic Resonance Images (MRI), first need to understand the size of the brain and the functionality of the brain. The size is taken from Structural MRI. Structural features are extracted from Cerebral White Matter (CWM) and from Cerebral Gray Matter (CGM). Image processing techniques are used for pre-processing the images and classification is done by using Artificial Neural Network (ANN). Anatomic features are extracted by calculating the area of the brain MRI. Functionality of the brain is measured by taking the slice time improvement and these all are succeeded by using image processing techniques. Linking the both Structural and Functional MRI together and then classify it as Autistic or healthy control using Artificial Neural Network.

**Keywords—** ASD, Structural MRI, Functional MRI, ANN.

## Introduction

Image processing techniques are used for processing an image using several methods. The input is an image and after several processing the output will also an image. Medical image processing is a technique for reliable medical related processing technique for diagnosing various health related issues. Diagnosing is the initial stage for a patient and physical diagnosing is difficult in some cases for that uses image processing techniques. Autism spectrum disorder (ASD) is one of the neuron related condition that effect early childhood. ASD is a brain ailment that is mostly seen in children and that effect the developmental phase of children. ASD is a lifelong condition that the subject has some disability such as Communication ailment, low focusing power, and short temper in nature. ASD is a condition that does not heal completely. Subject that effected by ASD should be properly reduced by giving good training. This condition is identified

by doctor using some observation method. Effected subject should be observed under several engagement methods. Diagnosing Autism Spectrum Disorder (ASD) by taking several methods, some of them are Magnetic Resonance Image (MRI), Engagement detection finding tools, and Eye movement tracking.

Autism Spectrum Disorder is a neuro-developmental disorder that affects the communication behavior of human, reciprocal social interaction and they are not enough to focus on object for a long period time or only focus things for short term or limited focusing power. ASD is diagnosis in early childhood; initially physical behavioral changes will be taken for diagnosis purpose. There structure of head is slightly differing from healthy control. Some of the previous studies says about the structural MRI (sMRI) and functions MRI (fMRI) [1]. This paper aims to consolidate sMRI and fMRI for diagnosing ASD using Artificial Neural Networks (ANN). Structural MRI mainly used for the identifying the shape of the brain. This work uses structural analysis of brain using MRI. Magnetic Resonance Image (MRI) it is the high resolution image of different tissues. Using the Nuclear Magnetic Resonance image (NMR). MRI of head uses a high magnetic field and radio waves and computer system to produce high resolution images. Here uses two types of MRI structural MRI and Functional MRI. Structural MRI consists of the structure of brain here focusing only on the size of the brain. Functional MRI brings out the neural activities in the brain. The sMRI and fMRI images are collected from the ABIDE dataset [2]. There are several studies that concentrate on the brain activation of autistic subject according to BOLD stimulation that is taken from the functional MRI sequence. Blood Activation Level Dependent (BOLD) will change according to the human activities. BOLD preprocessing is held by taking the changes in our fMRI sequence.

Functional MRI studies can be assorted into various task concerns [3]. In an elementary fMRI attempt by taking the subject that doing particular task, such as giving a visual fillip that with eye open and eye closed for 1 minute and examine the differences in brain. The fMRI [5] data is observed for determined the brain areas in which the magnetic resonance signal has a sequence of changes. These areas are taken to be activated by that visual fillip. This activation depends on the

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# A REVAMPED MODEL OF SINGLE PHASE STEP UP FIVE LEVEL INVERTER

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**Abstract**— A novel topology for step-up multi-level inverter which can be used for photovoltaic (PV) systems is proposed in this paper. One of the main advantage of the proposed topology, compared with the conventional five-level inverters, is that can realize the multilevel inversion with high step-up output voltage. As the number of power electronics switches is an important factor, the proposed topology, compared with the conventional five-level inverters, can be realized with less number of power switches and hence the structure is further abridged. As the switches define reliability, circuit size, cost, installation area, and the control complexity is substantially reduced. In this paper, the output voltage has been derived by analyzing the operating principle. We are also paralleling the proposed topology with the prevailing single phase five level topologies.

**Keywords**— Multilevel Inverter, Total Harmonic Distortion, Switch Diode Capacitor Cell, H Bridge.

## I. INTRODUCTION

In this era of immense energy crisis, the conventional energy sources are making more pollution whereas Renewable energy systems are attracting more attention due to its environmental and economic benefits. Being one of the most important parts of the photovoltaic systems, Inverter is a power semiconductor device that converts DC to AC, has also assimilated more attention and upgrading. Different topologies for photovoltaic systems were proposed due to the rapid growth of power electronics technology. Being more advantageous, multilevel inverters received significant interest in these proposed topologies. The multilevel inverters are used for industrial applications as an alternative in high power and medium voltage situations. Multilevel converters can produce a large number of output voltage levels, which results in high voltage capability, lower harmonic contents, lower switching losses, better electromagnetic compatibility, and high power quality. Multilevel converters are also used for several applications such as static reactive power compensation, adjustable speed drives, renewable energy sources, and so on.

The striking features of multilevel inverters are as follows:

1. They can generate output voltage with low distortion and lower  $dv/dt$
2. They draw input current from low distortion
3. They can operate with lower switching frequency

The main drawback of a multilevel inverter is that it requires a large number of semiconductor switches. Driver circuitry is

needed for each active semiconductor switches. And also the small voltage steps are typically formed by the isolated voltage sources or a bank of series capacitance. Cost and complexity is the main disadvantage of such a circuit. And the losses and the installation area will also increase.

When the number of levels in output increases, the number of components will also get increased which describes in [2]-[4]. In [5] for n-levels, it requires  $n+3$  switching devices. In [6] different DC voltage source are used and uses bidirectional switches. But the control circuit for bidirectional switches are difficult to implement. In [7] the maximum level possible is five. In [8] Sub-MLI units are symmetric but cascaded unit is asymmetric and full bridge is required at the output side which consists of unidirectional switches.

In [9] to reduce the number of DC supplies both single and 3-phase systems based on this topology are characterised by high and low frequency systems. In [10] requires bidirectional switches in Sub MLI unit and unidirectional switches in full bridge. Here the single phase full bridge operates at lower voltages. In [11] equal values for all DC sources and so all the voltage levels (odd and even) can be produced with equal steps. It uses both unidirectional and bidirectional switches. Here the Sub MLI unit will not produce zero so as to obtain zero and both polarities full bridge inverter is provided at the output terminal. In [12] requires capacitors since the additional switch is connected between the midpoint of the capacitor and H-bridge. In [13] Minimum level possible is seven. In [14] switches in full bridge must withstand higher voltages. In [15] uses two unidirectional power switches and one DC voltage source to the H-bridge inverter and thus produces 7-level or any higher levels. In [16] a number of voltage sources with switches and a diode are connected across the H-bridge and full bridge inverter is required at the output terminal. This topology reduces the number of components. In [17] voltage sources have equal value and hence it is called symmetric. Thus towards efficiency, price and amount of devices consumed is measured as a prime for high power and high voltage applications [18].

In this paper, we are proposing a multi-level inverter topology which realized by using reduced number of power

# HIGH VOLTAGE GAIN DC-DC CONVERTER FOR DC MICROGRID

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**Abstract**— A group of non-isolated DC-DC high voltage gain converters for Dc micro grid is discussed here. The combination of non-isolated boost interleaved converter helps to obtain high step up gain without operating in a high duty ratio conditions. Through interleaved manner ,a continuous current can be drawn from the given input sources. This converter can reduce the input current ripple and current stress which results in the increase the lifetime of the input source and the decrease in conduction losses . These advantages makes this in appealing for renewable applications such as solar systems, microgrid systems etc. Also they can be used to interface the 400-V DC bus in a microgrid system using the low power voltage sources like batteries, photovoltaic (PV) panels ,fuel cells, etc.,

**Keywords:** Cuk , PV ,Modified Cuk converter, LTSPICE

## I. INTRODUCTION

Nowadays, importance and the use of renewable energy demand is increasing drastically and it is employable globally, the reason behind this is the energy shortage and the present environmental problems. The renewable energy systems such as fuel cells, wind power generation, and photovoltaic (PV) systems needs a dc-dc high voltage gain converters and also want a high voltage output, for this need the use of high voltage gain dc-dc converters demand is increasing dtastically [5]. So the interfacing of a 400-V DC bus in a dc microgrid system voltage sources like fuel cells, photovoltaic (PV) panels, batteries, etc. can be established by using this type of converters[4]. It can also find different of application like the interfacing of uninterruptable power supplies, high-intensity discharge lamps for automobiles etc[3].

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For an actual power converters the continuous variation in the operating frequencies results in a high switching losses, low efficiency etc. In order to calculate the switching losses there some circuit simulation softwares it contains different switching device models .

But the problem is that this methods are time consuming , the information regarding to this is very limited and the result is not accurate[12]. The main problem is that this calculation only provides valid information and not to provide general information on the basis of physical insight. The other problem is that analytical switching losses (on the basis of some assumption) results in less accurate but it is easy task for the designers to calculate it in an easy manner , by using this they can make immediate comparisons on the basis of some of the operating parameter and switching performance[1].

There are some systems which is used to convert the dc- dc, low voltage to high voltage, renewable energy to electrical energy and vice versa. For this type of system requires a high step up conversion and also need high step up gain , which results in the increase in the cost and decrease in the efficiency[12]. By analytically calculating the switching models the designers must have much more knowledge about the switching loss mechanism and also need some physical insight about it.

In centralized inverter topology ,the simplified version of AC module configuration is used. In this ,inverter is connected with a single string of PV modules. For minimizing the losses separate MPPT algorithm is applied to each String of the PV modules[9]. By comparing this with the centralized inverter topology, it creates a reduction in the system reliability and increase in the overall efficiency of the system. The reduction in the system reliability is mainly due to the connection of individual PV modules in the high voltage gain converters[14]. By connecting a multiport high voltage converters and power sources for power sharing, MPPT algorithms etc. For each individual module we can implement this method also at the input port.

By implementing the commonly used step up converters like buck boost converter, flyback converters, boost converters etc because of leakage inductance and losses in the resistance reduce the efficiency and high step up conversion ratio and also the voltage stress quite large for this type of converters [13]. In order to overcome this high voltage step up gain

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# AN INTERLEAVED CONVERTER WITH MAXIMUM POWER POINT TRACKING

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**Abstract**—This paper, discusses a non isolated boost converter with high step up gain with an MPPT controller. The converter is meant to be used as an interface between photovoltaic panels and the utility grid. The solar panel or array without an MPPT results in wasted power and number of solar panel needed to be installed increases. Incorporation of an MPPT controller ensures that a PV module or panel is maintained and operated at the voltage that results to maximum power point at all operating temperature and irradiance. MPPT Results in the reduction of overall installation cost. The MPPT is implemented using modified incremental conductance algorithm. Thus the converter delivers maximum power at all operating points. The simulations are done using MATLAB/SIMULINK software and a 30W laboratory prototype is implemented to validate the results.

**Index Terms**— non isolated, boost, MPPT, PV, voltage multiplier ,modified Incremental conductance.

## I. INTRODUCTION

Renewable sources of energy are valued worldwide because of energy shortage and environmental pollution. Renewable energy systems creates a low voltage output that necessitates the use of a high step-up DC-DC converters. These are broadly applied in various renewable energy applications, like fuel cells, wind energy, and photovoltaic systems. The future energy production will be dominated mostly by the photovoltaic systems.

A major portion of solar radiation incident on the PV module adds to the panel temperature rise , and the overall efficiency of the system, becomes major concern. The operating temperature and the solar radiation largely determines the output current and voltage of the panel respectively. As a result the output parameters varies with the atmospheric conditions. To entirely utilise the incident energy and to enhance the efficiency, the system should operates on its optimal condition under variant environmental elements this necessities the presence of a maximum power point tracking methods along with the system [2].

The main challenge in designing the MPPT controller is the design simplicity and controller implementation. MPPT is used for operating PV array at an optimal point which extracts maximum power regardless of irradiance, temperature and load current variation. [1],[5],[8],[9],[12] proposes different MPPT techniques but their appropriateness largely depends on factors like the end application, dynamics of irradiance, design easiness, speed of convergence , hardware implementation and the cost [4]. The existing MPPT methods ranges from simple voltage relationships to complex multiple sample based analysis, which comprises constant voltage method, short current pulse method, open voltage method, perturb and observe method, incremental conductance method, and temperature method [5]. The Incremental Conductance method exhibits excellent tracking ability , and so is the considerable one among all present MPPT methods.

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# HIGH GAIN SINGLE STAGE INVERTER

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**Abstract** – The two stage conversion system is to supply power from a low input source to the high voltage output load incorporating, a chopper along with an inverter. Single stage transferring systems (SSCSs) are formed by including both inverter and chopper conversion systems. It has many advantages such as minimum losses, reduced size and less reverse recovery problems. Here a single stage inverter is presented with features like high gain, low switching losses, free from adverse effects of drop in inductance and it can produce the output voltage higher or lower than the input dc voltage without any intermediate power conversions or transformers. The theory part and simulation of the system are included in this paper.

**Index Terms**— TSCS, SSCS, buck-boost, inverter

## I. INTRODUCTION

Our Earth contains renewable and non-renewable energy sources. The Earth receives an incredible supply of renewable solar energy. There are several advantages of photovoltaic solar energy such as non polluting, requires less maintenance [1]. However the ratio of price/efficiency is still too high for solar systems [2]. Therefore high performance power electronic converters were introduced as a solution to this problem. The Photovoltaic (PV) output voltage is unregulated dc, which is depending on several factors such as isolation, temperature etc. The unregulated dc has to buck or boost the input voltage and then inverting it. This two stage power conversion system (PCS is obtained by combining the buck boost converter and an inverter). It has some drawbacks like lower efficiency, lower reliability etc.

Mainly the Photovoltaic (PV) inverters are classified as the centralized inverter; string inverter and micro inverter [3]. High and medium power applications centralized and string inverters are

used. By the use of large PV array partial shading and mismatch occurs. To avoid these problems, the micro inverter to operate a single module has been designed [4]. Boost type single stage topologies are there introduced in which voltage step up and inversion can be done [5]. This system makes use of an impedance network and coupling capacitor to connect the inverter to the power supply. The control is very complex and only the zero shoot through state can be controlled.

The different inverter topologies were introduced for the photovoltaic system. The voltage source inverter is a buck converter in which the voltage obtained at the output is less compared to input voltage. Introduction of boost single stage topologies helps to reduce the electromagnetic interference problem to maximum extent [6]. The high gain topology shown in fig 1 is employing sinusoidal pulse width modulation control strategy for the switches. The PV panels with 70-100V DC output are commonly used due to high dc step up gain. [7] - [8]

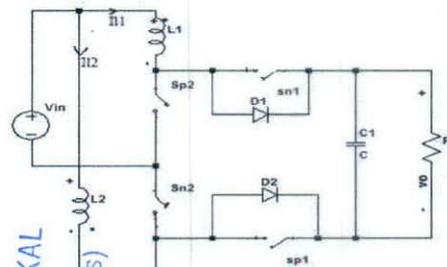


Fig. 1: Single stage buck boost inverter

A topology containing two inductors is introduced in [9], which has less number of switches, minimum operating losses and reduced size. But the gain is very limited. Other single-stage topologies are presented in [10], [11] The main drawbacks of these topologies are they are not suitable for low input voltage applications due to

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# Design of an Integrated Speed Tracking and Toll Management System for Express Highways

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**Abstract**— This paper is about the more sensitive and innovative way of maintaining the traffic speed standards along with impartial toll distribution for every citizen passes through the highway giving prior importance to the human safety, security and egalitarianism. It's a novel replacement for the dull conventional traffic system. In this, the time of passing of a vehicle is recorded at every instant where the scanners are placed to deduce the fair toll amount from their account and to record their speed. Even if, we prefer to use Radio-frequency identification tags on every vehicle that passes the toll gate, on the worst side, the Optical Character Recognition technology is used and applied over the high contrast images being captured by the cameras. The time-and-speed thresholds between the checkpoints are then calculated and have been set up accordingly. The vehicles exceeding the thresholds are noted and are charged with appropriate penalty. This results in an impartial and symmetric way of tracking speed resulting on an effect over the fear-factor of drivers on taking up speed. This work aims to provide the real-time speed monitoring system and fair toll distribution system thus ensuring more reliability and quality to the Indian traffic system.

**Keywords**— Radio-frequency identification; Optical Character Recognition; Speed Monitoring system; Toll Distribution

## I. INTRODUCTION

The road accidents in India is increasing rapidly due to the over speeding of the vehicles and rash driving of the motorists on highways and public roads [1]. The number of accidents has increased with the number of vehicles and motorists on road. Statistics reveal that nearly 382 people lost their lives on Indian roads every day. Nearly one million people are killed and injured in Indian roads by accidents. [1][9]. Speeding is the single factor responsible for the maximum number of deaths on Indian roads [2]. To control, monitor and record the speed of vehicles on highways, the various departments of government has been taking necessary steps. But, the fact is that, it's inefficient and partial. At present, the express highways are having conventional speed cameras which can capture the speed of a vehicle only at that instant. Also, these speed cameras are of high cost and maintenance. The issuing of summons in this system requires manpower and thus, it cannot be claimed as an automated system. Also, the long queues at the toll booths are too frustrating for the person who fights with time and the toll amount distribution at

present is much impartial such that a person who needs to travel a few meters beyond the toll booth also has to pay the whole amount irrespective of the distance he wants to cover by road. The drift for this paper was derived from the aspects mentioned above.

Salem et al suggested a Speed Control Driver module which is connected to the vehicle dash board that will alert the driver to reduce the speed. This technology is an alert system for the drivers to have a better control of their vehicle[3]. ARM processor has been used and Keil C software is used for the simulation[3]. In [4] a vehicle speed estimation method is used through a sequence of images. Noise removal and image enhancement techniques need to be focused for efficient working of this method. N. Diogo in his paper proposed a text detection method to detect the vehicle number from the license plate of passing vehicles[5]. Kanade-Lucas-Tomas (KLT) and the Scale-Invariant Feature Transform (SIFT) algorithms are used to detect these features[5]. In [6] a system was proposed using RFID to give alerts to drivers when it enters speed limit zone. Here speed control areas like schools, hospitals are marked as speed limit zone where the driver is given alerts. This system will work effectively depending on the discretion of the driver to slow down or not. Unfortunately this is found ineffective due to this feature. Gorajanal et.al in his paper investigates the reasons of road accidents happening and suggested that embedded systems mounted on vehicles help to give prompt information regarding accidents which can be used by experts for reconstruction.[7] This idea can be used to develop data that can be used for study of different attacks

Our proposed system aims to develop an effective Highway management system to track the speed of the vehicle and for the toll distribution in a much simpler and economical way. A shift in focus from traditional highways to Intelligent Express Highways is the need of the day in India [10] This system can work 24x7 without any human interventions. We thought to use the original raw RFID reader but when considering the cost, for the prototype, the usage of RFID 1320 module was found more feasible [8][11][12]. This RFID module will fulfill the requirements with its key features as it's more economical, accuracy, high reliability etc[13][14][15]. In this paper, by using the RFID module and RPi as the main components, speed monitoring and toll distribution can be done effectively. RFID stickers fixed on the vehicle and the reader is placed at the roads on poles as checkpoints

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# Intelligent Tool For Malayalam Cursive Handwritten Character Recognition Using Artificial Neural Network And Hidden Markov Model

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**Abstract**— This paper represents an attractive method for the conversion of the image into an editable text as it is written by Optical Character Recognition (OCR). With this offline handwritten character recognition method, it shows the ability of a computer to receive and recognize handwritten input. Computers may find some difficulty in deciphering the exact handwritten characters with different fonts and styles. This paper mainly focuses on the recognition of handwritten Malayalam (a South Indian Language) characters. Thus cursive Malayalam characters can be recognized by Hidden Markov Model (HMM). The classification is done with Artificial Neural Network (ANN). Handwritten character recognition with high accuracy and efficient method to recognize the cursive letters are included in the proposed system.

**Keywords**— Handwritten character recognition (HCR), Optical Character Recognition (OCR), Cursive Malayalam characters, Hidden Markov Model (HMM), Artificial Neural Network (ANN).

## I. INTRODUCTION

Handwritten character recognition (HCR) has been one of the most fascinating and challenging research in the field of image processing and pattern recognition. Many efforts have been made in recognizing both online and offline character recognition automatically. Many approaches have been proposed, most of them focus on the English language. In this work mainly two approaches have been included to identify the offline handwritten characters. They are Artificial Neural Network (ANN) and Hidden Markov Model (HMM). Gradient descent algorithm for ANN and a statistically based recognition method to recognize handwritten cursive characters are used here[1].

OCR has become one of the most successful applications of technology in the field of Image processing, Pattern recognition, and Artificial intelligence[2]. There are a number of different technologies are being used and tested for Malayalam handwritten character recognition. Due to variations of the handwritten characters still, its recognition didn't acquire 100% accuracy. Most character recognition methods follow the steps shown in figure 1. The figure System of recognition (Figure 1) shows that the input scanned image will be given for pre-processing thus to make it noise free,

binarization, smoothing, normalization. Thus the pre-processed image will be given for segmentation and thus it will be segmented into isolated characters by assigning a number of each character using labeling process. This labeling provides information about a number of characters in the image. Thus the segmented output will be given for extraction in which the features will get extracted. In this proposed system the feature extraction is based on character geometry. It extracts different line types that from a particular character[1],[2].

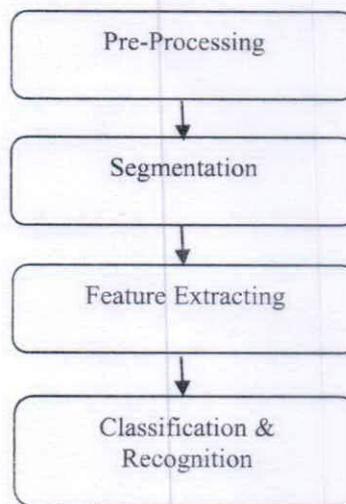


Fig 1 : System Of Recognition

Thus, the extracted features will be given as the input to the final step- Classification and Recognition. Classification is based on Neural network and Recognition is based on HMM.

## II. DETAILS EXPERIMENTAL

### A. Malayalam Characters

The Malayalam language is the mother tongue of the State of Kerala, the southernmost part of India. It contains totally 51 letters which have 13 Vowels and 37 consonants. A set of

*Sunny*

# BRAIN ACCURACY ANALYSIS BASED ON MOTION DETECTION THROUGH GAITING

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**Abstract:** This paper presents a novel approach for brain accuracy analysis based on motion detection through gaiting. For our experiment, one person is walked through a straight line by hiding the eyes and measured rate of deviation from actual path includes starting and ending point. A camera is placed to capture person walking through given path .By using image processing technique the rate of deviation was calculated. This work mainly focuses on brain analysis using some experiment.

**Keywords—** brain analysis, motion detection, gait

## I. INTRODUCTION

Robert Krulwich did an experiment why we can't walk on a straight line without a visible guide point [5]. From that we can understand that walk on a straight line without a visible guide is a difficult task. Inspired from this we are take an experiment and implemented with the background of computer science. This is a good reference for understand our brain capacity or we can analysis our brain from this. In our project we conducted an experiment for this a small straight path of some meters is drawn on the floor. The person whose capacity is to be measured is asked to walk

through the path in his/her normal speed. After reaching the final point he/she is asked to walk back through the same path by hiding the eyes with a piece of cloth. Then measure the rate of deviation from the actual path. This is not simple task but we can understand one thing more intelligent people did this accurately. Based on the brain capacity of the people accurateness is different. This work based on the image processing [15]. Next two sections describe the related work and proposed system. In the related work we take two papers for help this project and in the proposed.

## II. RELATED WORK

For the related of the work we focus on the approaches that present some differential with relation the centred only in verification in object detection and line detection. For those approaches we aim to evidence its possibility front to line detection and object detection here proposed.

The work of [1] describe the how to detect the objects. It is mainly use the object tracking with kalman filter. The typical kalman filter contains the process equation, measurement equation, time update equation and measurement update equation the next section contains the kalman filter for multiple object tracking. In the multiple

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