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ICASHAP1043

A Theoretical Review on Bio Medical Waste Management (BMWM)

In India

N. Karanthi Rekha¹, Dr. Neelam Sridevi²

¹Assistant Professor, Department of Civil Engineering, SRK Institute of Technology, Vijayawada, Andhra Pradesh, India.

²Assistant Professor in Environmental Sciences, SRK Institute of Technology, Vijayawada, Andhra Pradesh, India.

ABSTRACT

Bio Medical Waste (BMW) involves all the waste produced by hospital institutions, research laboratories. BMW also incorporates waste from minor or scattered sources like the treatment undertaken in healthcare such as home dialysis, insulin injections, etc. BMW comprise of wastes from treating infectious patients who can transmit the contagion either directly or indirectly with the contact with environment. BMW involves all organic wastes and inorganic wastes originated as consequence of patient medication or treatment related to medical research. BMW has sources from nursing homes, polyclinics, blood banks, research institutes, veterinary clinics etc. The two crucial threats from BMW are toxicity and infectivity. World Health Organization (WHO) showed that general 85% of wastes in hospitals are not lethal, and 15% of wastes are contagious waste. In present scenario Bio Medical Waste Management (BMWM) has become a worldwide humanitarian issue. It is a known fact that there are many adverse and harmful effects to the environment including human beings which are caused by the BMW generated during the patient care. This paper describes about Bio Medical Waste Management (BMWM) steps are minimization, segregation, collection, transportation, storage, treatment, disposal of BMW. In this paper, we discussed about BMW treatments like thermal treatments methods like autoclaving process, incineration process and chemical treatment methods, irradiation treatment methods, biological treatment methods, mechanical treatment methods are explained. And also we suggested BMW disposal methods for safe environment.


Keywords: Bio Medical Waste (BMW), Bio Medical Waste Management (BMWM), Bio Medical Waste Treatment, Bio Medical Waste Disposal.



Proceedings of International Conference on Computational Intelligence and Data Engineering pp 259-272 | [Cite as](#)

Optimized Candidate Generation for Frequent Subgraph Mining in a Single Graph

Authors Authors and affiliations

D. Kavitha , D. Haritha, Y. Padma

Conference paper

First Online: 21 December 2020

26 Downloads

Part of the [Lecture Notes on Data Engineering and Communications Technologies](#) book series (LNDECT, volume 56)

Abstract

Mining frequent subgraphs from graph databases is a basic task with broad applications. Frequent subgraph mining is defined as finding all subgraphs that appear more than specified threshold value. It consists of mainly two steps, candidate generation and frequency calculation. In candidate generation step, most of the existing work starts with a frequent edge or vertex to generate frequent candidate patterns. This process is not scalable due to exponential number of candidate patterns generation. In this paper, an optimized algorithm is presented to generate candidate patterns for mining frequent subgraphs from a large single graph. The proposed algorithm starts and extends candidates with frequent subgraphs. The proposed algorithm uses graph invariant properties and symmetries present in a graph to generate candidate subgraphs thus reducing generation of enormous amount of candidate subgraphs. Subgraphs are extended by adding another frequent subgraph determined by the symmetry mapping of subgraph there by reduces the complexities involved in candidate generation and frequency counting. An evaluation study on datasets explores the strengths and

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
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COVID Detection from Chest X-rays with DeepLearning: CheXNet

D.Haritha

Dept. of Computer Science
SRK Institute of Technology
Vijayawada, India
harithadasari@rediffmail.com

M. Krishna Pranathi
Dept. of Computer Science
SRK Institute of Technology
Vijayawada, India
pranathi.meegada@gmail.com

M. Reethika

Dept. of Computer Science
SRK Institute of Technology
Vijayawada, India
reethikanov1@gmail.com

Abstract— The novel corona virus is a rapidly spreading viral infection that has become a pandemic posing severe threats around the world. It is necessary to identify the cases priorly so that we can prevent the spread of this epidemic. But the availability of test kits is low which is main drawback. To overcome this AI is assistive and even used in COVID detection and prediction. A model for COVID prediction from chest X-rays using CheXNet is presented in this paper. This proposed model classifies the binary classes (COVID and normal) with 99.9% accuracy. CheXNet is a CNN model that used ChestXray14 dataset and was trained to detect abnormalities in chest X-rays. Generally, this model was extended to detect all the 14 pathologies in chestXray14 dataset. We used it's pre trained model Densenet121 in our model to detect COVID19 from binary classes.

Keywords— COVID 19, CheXNet, DenseNet121, Pneumonia

I. INTRODUCTION

For the last eight months, we are witnessing pandemic situation throughout the world due to COVID 19, a new corona virus first observed in Wuhan, China in December ,2019 first suspected as pneumonia. Then after initial study, the virus is identified as its genesis I Severe Acute Respiratory Syndrome (SARS) and is termed as SARS-CoV-2. This virus causes respiratory infections like cold at an early stage and can lead to the most severe respiratory attacking diseases like Middle East and Severe Acute Respiratory Syndromes called MERS and SARS. The clinical features of the disease include fever, sore throat, headache, cough, mild respiratory symptoms even leading to pneumonia. The testing techniques that are being currently used for COVID diagnosis are Polymerase Chain Reaction (PCR) and Reverse Transcription PCR popularly known as RT-PCR. As RT-PCR tests take much time for prediction, and also due to limited availability of these test kits, early detection cannot be done which in turn

increases the spread of disease. COVID became a pandemic effecting globally and right now there is no vaccine available to cure this. In this epidemic situation Artificial Intelligence (AI) techniques are becoming vital.

Some of the applications where AI is imported are- AI is employed in cameras to trace infected patients with travel history using face recognition, robots to dis-patch food and medicines, drones to sanitize public places etc. [1]. Nowadays Artificial Intelligence is significantly being used to analyze RNA structure of COVID-19 virus and in research for discovering its drugs and vaccine. A vast research is being carried out in using AI in health care systems widely from disease prediction, patient monitoring, analyzing RNA structures, discovering new drugs and medicines for disease cure and developing vaccines for many diseases. Implementation of machine learning techniques for automatic disease diagnosis and identification is aiding the doctors as a supportive tool and gaining its popularity in the medical field as one of the major application areas of ML. Deep Learning (DL) a sub field of ML is being successfully applied in several issues like carcinoma detection, carcinoma classification, and respiratory disorder detection from chest x-ray pictures. Day by day the covid19 is growing at an exponential rate so, we need to inculcate these AI techniques to increase the testing rate. Recently, many researchers widely used radiology images for COVID-19 detection. The observation from the chest X-ray is a dis-criminating factor; if the chest X-ray is normal; patients can go home and wait for the laboratory test results, but in other case when using RT-PCR test the results are obtained late and the patient will be quarantined until the result arrives. That's where the significance of our work carried out in this paper lies. Thus, CT images and X-rays have vital role in prior detection of this disease which can be used as screening tool. Therefore, simple, precise, and faster AI models are helpful to overcome the problem of delay in disease identification and help patients in early discovery and cure. Deep Learning is used in such disease diagnosis,

Prediction of COVID-19 Cases Using CNN with X-rays

Dr D. Haritha

Dept. of Computer Science
SRK Institute of Technology
Vijayawada, India
harithadasari@rediffmail.com

N. Swaroop

Dept. of Computer Science
SRK Institute of Technology
Vijayawada, India
nagothiswaroop25@gmail.com

M. Mounika

Dept. of Computer Science
SRK Institute of Technology
Vijayawada, India
mounikamunagala1999@gmail.com

Abstract— The Corona Virus Disease popularised as COVID-19 is a highly transmissible viral infection and has severe impact on global health. It impacted the global economy also very badly. If positive cases can be detected early, this pandemic disease spread can be curtailed. Prediction of COVID-19 disease is advantageous to identify patients at a risk of health conditions. Applications of Artificial Intelligence (AI) techniques for COVID prediction from X-rays can be very useful, and can help to overcome the shortage of availability of doctors and physicians in remote places. This paper proposes a transfer learning model using GoogLeNet for COVID-19 prediction from chest X-ray images. For image classification we used GoogleNet which is one of the CNN architecture and is also named as InceptionV1. The positively classified images by our model indicate the presence of COVID-19. The results obtained in COVID prediction using GoogleNet with a training accuracy of 99% and testing accuracy of 98.5% emphasize the use of Transfer Learning models in disease prediction.

Keywords— X-ray images of chest, Prediction, COVID-19, GoogleNet.

1 INTRODUCTION

THE Corona Virus Disease (COVID-19) is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and is highly transmissible. It came into China government's notice in December, 2019 in Wuhan and more than twenty five million people all over the world were affected by it. Coronavirus is challenging all the people and the technology on the entire planet. As of August 2020, there are more than 27 million COVID-19 cases and 873,000 deaths globally [1]. There's no vaccine or immunizing agent found till date, thus the challenge is how best to fight against the Coronavirus to prevent its transmission. People with low immunity, old age, and medical issues especially associated with lungs are more vulnerable to COVID-19 sickness. The symptoms of COVID-19 are cough, cold, high fever and respiration issues. Preventive measures for COVID-19 square

measure to shield oneself by washing hands off, avoid touching mouth, eyes, nose and face, and by maintaining social distance with others.

Since there's no immunizing agent identified till now for COVID-19 and sickness is contagious, the infected people rate is increasing at a faster pace. The tests that square measure the Coronavirus to ascertain the existence of sickness urge to take a look at results, as the variety of symptoms of positive cases has been increasing than the early days of identification of the virus on this planet. As COVID-19 has reached pandemic standing and the number of cases continues to grow at an exponential rate, wide accessibility of diagnostic testing is essential in serving to determine and curtail the spread of this quickly spreading sickness. The most common tests for COVID-19 identification include Chest Tomography imaging like Computed Tomography (CT) scan and X-rays [7]. These can be significantly used in early identification and treating this sickness in addition to RT-PCR (Polymerase chain reaction), isothermal nucleic acid amplification and antigen tests. After a thorough study on CT scan of respiratory organs lungs of patients infected with COVID-19 respiratory disorder, the foremost important respiratory organ is affected and identified after ten to twelve days after getting attacked with the virus. As RT-PCR tests take longer time for prediction, medical practitioners express that quick and early detection from clinical tests of X-rays can help to decide whether the patient is to be kept in observation by isolation until the laboratory test results come. This early prediction from X-rays prevents fast spreading of the disease to others during that gap. The chest X-ray observation is a discriminating factor; if the chest X-ray image is normal, patients can go home and wait for the laboratory test results. That's where the significance of our work carried out in this paper lies. Significant research has been carried out in applying machine Learning for automatic identification of diseases and has recently gained quantity and quality. Deep

Covid Prediction from X-ray Images

D.Haritha

Computer Science and Engineering Department
SRK Institute of Technology
Vijayawada, India
harithadasari@rediffmail.com

Ch.Praneeth

Computer Science and Engineering Department
Koneru Lakshmaiah Education Foundation
Vaddeswaram, India
chpraneeth@hotmail.com

M.Krishna Pranathi

Computer Science and Engineering Department
SRK Institute of Technology
Vijayawada, India
Pranathi.meegada@gmail.com

Abstract— Early detection of COVID 19 is having the significant impact on curtailing the COVID 19 transmission at faster rate and is the need of the hour. An Artificial Intelligence diagnostic using Deep Learning models trained with X ray images of COVID infected and noninfected patients is a new promising method that helps in early prediction and identification of COVID infected persons. This paper 'COVID prediction from X-ray images' acquaints a system to be utilized for automatic identification of corona virus from chest X-ray by machines in less time i.e. less than five minutes. For this we consider dataset of chest x-ray images of pneumonia, COVID 19 disease and normal infected people. We use the concept of Transfer Learning for its advantage of decreasing the training time for a neural network model. Using the VGG model of Transfer Learning we show an accuracy of 99.49% in prediction of the COVID 19 from X ray of the suspected patient.

Keywords—COVID-19; pneumonia; transfer learning; VGG16

I. INTRODUCTION

COVID-19 is the communicable disease caused by most recently discovered corona virus posing serious threats to the general public health and economies of countries. This cause respiratory infections starting from cold to most severe cases like Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). Its outbreak began in Wuhan, China in December 2019. This spread primarily from person to person and till now there is no vaccination or medicine to prevent or cure the disease. The only way to control the spread of the disease is social distancing and self-isolation. To control its spread early identification is important. The symptoms of the disease include fever, sore throat, headache, cough, mild respiratory symptoms even leading to pneumonia. It's now pandemic affecting many countries globally. The number of cases around the world has been increasing exponentially. Daily thousands of people are being confirmed with corona positive and the number of deaths is also growing [1]. One of the ways to spot this is Polymerase Chain Reaction (PCR) test. It locates a particular coronavirus gene sequence and creates

multiple copies that can then be easily spotted. Along with this PCR test we can use reverse transcription PCR test. This is done by collecting samples of nasal secretions. These test kits are available in very less number that is not sufficient to the current scenario. Since reverse transcription polymerase chain reaction (RT-PCR) test kits also are meagre, there exists a requirement to explore alternative means of identifying and prioritizing suspected cases of COVID-19. Other-wise this virus will spread easily thus increasing the positive cases. So, in addition to these medical tests it is good to aid computer technology like Artificial Intelligence, as it can play a vital role. Artificial Intelligence (AI) is used in cameras to track infected patients with travel history using facial recognition so that we can easily identify other people who are in physical contact with corona effected person., robots to deliver food and medicines for patients, drones to disinfect public places etc. [2]. AI has been used extensively to find new molecules on the way to find aid for COVID-19.

Many researchers are using AI to seek out new drugs and medicines for the cure, along with some computer science researchers focusing on detecting the infectious patients through medical image processing like X-rays and CT Scans [3]. Covid effects lineup of respiratory track, shows preliminary symptoms like pneumonia and as doctors frequently use x-rays to test for pneumonia etc., identification of covid using X-ray can play significant role in corona tests. So, to increase the covid testing rate we can use X-ray test as preliminary test and if AI prediction test results in positive then patient can undergo medical test. In this paper we used transfer learning which is a machine learning technique that focuses on reserving knowledge gained while solving one problem and apply that on other. A dataset consisting of chest x-ray images of Covid-19 patients and normal patients is used for transfer learning.

Section II briefs some of the recent works done in Covid prediction using AI and Deep Learning (DL) techniques. Section III presents our methodology used for application of VGG16 model for Covid prediction and discusses the testing results.

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PRINCIPAL
SRK INSTITUTE OF TECHNOLOGY
ENIKEPADU, VIJAYAWADA

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D.Haritha

Computer Science and Engineering Department
SRK Institute of Technology
Vijayawada, India
harithadasari@rediffmail.com

Ch.Praneeth

Computer Science and Engineering Department
Koneru Lakshmaiah Education Foundation
Vaddeswaram, India
chpraneeth@hotmail.com

M.Krishna Pranathi

Computer Science and Engineering Department
SRK Institute of Technology
Vijayawada, India
Pranathi.meegada@gmail.com

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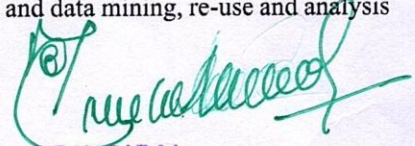
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SRK INSTITUTE OF TECHNOLOGY
ENIKEPADU, VIJAYAWADA

Paper ID: ICCIASH-2020/309

Faculty Rewards Recommendation System

M.Rithvik

Department of CSE
SRK INSTITUTE OF TECHNOLOGY

M.Naresh Babu

Department of CSE
SRK INSTITUTE OF TECHNOLOGY

N.V.Madhu Bindu

Department of CSE
SRK INSTITUTE OF TECHNOLOGY

Abstract:

The prosperity of a Nation lies on a soldier in the war field and the faculty in the classroom. Education is a vital investment for human and economic development and it is a long-run phenomenon. Education system is affected by the customs, culture, traditions and faith and at the same time reflects them. In this regard there is a need to evaluate the outcomes and performance of faculty from time to time. So, there is a need for a system that recommends the evaluation and simultaneously give a reward to the faculty. In this paper, the current faculty reward systems are critically reviewed with suggestions made for further improvements. Although there are encouraging signs, it is our belief there is a need to measure the quality of teaching, research, and service provided by the faculty to enrich their learning abilities in turn benefits the student learning as well so a faculty member must be rewarded accordingly.

This Project sought to establish the effects of reward system towards enhancement of teacher's performance which is finally translated into good pupil performance. This Project deals with the reward system and their effects on the performance of teachers in education system.

Key words: *Recommendation system, machine learning, classification, random forest.*

*Corresponding Author
E-mail Address: rithvikmadugula@gmail.com

Paper ID: ICCIASH-2020/309

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M.Rithvik

Department of CSE
SRK INSTITUTE OF TECHNOLOGY

M.Naresh Babu

Department of CSE
SRK INSTITUTE OF TECHNOLOGY

N.V.Madhu Bindu

Department of CSE
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*Corresponding Author
E-mail Address: rithvikmadugula@gmail.com

Paper ID: ICCIASH-2020/309

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M.Rithvik

Department of CSE
SRK INSTITUTE OF TECHNOLOGY

M.Naresh Babu

Department of CSE
SRK INSTITUTE OF TECHNOLOGY

N.V.Madhu Bindu

Department of CSE
SRK INSTITUTE OF TECHNOLOGY

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*Corresponding Author
E-mail Address: rithvikmadugula@gmail.com

Covid Prediction from Chest X-rays using Transfer Learning

Dr.D.Haritha¹[0000-0001-9866-6289] and M.Krishna
Pranathi²[0000-0002-8711-5243]


¹ SRK Institute of Technology,Vijayawada,India

Abstract. The novel corona virus is a rapidly spreading viral infection that has become a pandemic causing destructive effects on public health and global economy. So, early detection and Covid-19 patient early quarantine is having the significant impact on curtailing it's transmission rate. But it has become a major challenge due to critical shortage of test kits. A new promising method that overcomes this challenge by predicting Covid-19 from patient X-rays using transfer learning, a deep learning technique is proposed in this paper . For this we used a dataset consisting of chest x-rays of Covid-19 infected and normal people. we used VGG, GoogleNet-Inception v1, ResNet, CheXNet models of transfer learning which is a deep learning technique for its benefit of decreasing the training time for a neural network model. Using these we show accuracies of 99.49%, 99% ,98.63%,99.93% respectively in Covid-19 prediction from x-ray of suspected patient.

Keywords: Convolutional Neural Network · Covid-19 · Transfer Learning.

1 Introduction

In December 2019, Covid-19 caused by most recently discovered corona virus was first reported in Wuhan, China as a special case of pneumonia and later named as Covid-19 and the virus as SARS-CoV-2. It infects respiratory system at mild level common cold to most impacting MERS (Middle East Respiratory Syndrome) as well as SARS(Severe Acute Respiratory Syndrome). The clinical features of the disease include fever, sore throat, headache, cough, mild respiratory symptoms even leading to pneumonia. The better accurate test techniques that are being currently used for Covid diagnosis are Polymerase Chain Reaction and Reverse Transcription PCR[1] tests and are laboratory methods that interact with other RNA and DNA to determine volume of specific RNA using fluorescence. This is done by collecting samples of nasal secretions. Due to limited availability of these test kits, early detection can not be done which in turn leads to increase in the spread of disease. Covid became a pandemic affecting globally and right now there is no vaccine available to cure this. In this epidemic situation Artificial Intelligence techniques are becoming vital. Some of the applications in this Covid pandemic scenario that show promising use of AI



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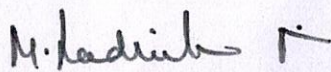
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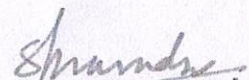
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Dr. S. Sambhu Prasad
Principal


PRINCIPAL
SRK Institute of Technology
ENIKEPADU, VIJAYAWADA-521 108.

A Smart Women protection system using Internet of Things and Open Source Technology

B.S.S.Telesh
Assistant Professor, Dept of ECE
SRK Institute of technology
Vijayawada, India
email Id: teleshbss@gmail.com

T. Peter Paul
Dept of ECE
SRK Institute of Technology
Vijayawada, India
email Id: tammuluripaul@gmail.com

Yarabarla Mohan
Dept of ECE
SRK Institute of Technology
Vijayawada, India
email Id: mohansaiy7722@gmail.com

R Sai Rishitha
Dept of ECE
SRK Institute of Technology
Vijayawada, India
email Id: sairishitha30@gmail.com

CH.Anil Kumar
Dept of ECE
SRK Institute of Technology
Vijayawada, India
email Id:
chava.anilkumar98@gmail.com

B.Purvaja Durga
Dept of CSE
KL University
Guntur, India
email Id: purvajapuri@gmail.com

Abstract— In the contemporary era, Now a days there is a surge in the crimes contra to the women. Women are obverse with molestation, sexual torment and acid assaults in the nonce civilization. There is no Impeccable system that ensures protection for the women. In this paper, a persuasive protection and alert framework for women has been evolved. The refined system assures a safeguard for women in the aspects of tracking, recording and self-defense. The smart women protection system is unified with Internet of things and open source technology to contribute favored ensue. The Raspberry Pi 3 and ESP8266 Wi-Fi device employed with modules aforementioned as fingerprint, GSM, GPS, camera, body sensors and Nerve simulator enhances to accomplishngly safeguard the women. The GSM, GPS, camera, fingerprint module and body sensors ensures the tracking and locating the women. The nerve simulator employs the job of self defense. In the case of troublesome situation, women in the equipped device ensures the fingerprint and then the GPS and GSM equipped with a microphone and speaker, camera and body sensors will be triggered and the location alerts will be directed to the corresponding persons and stats will be updated in the server also with the aid of nerve simulator an array of shocks can be remitted to the attacker. The developed framework insure that it immensely accomplishes its task in protecting a women in all the circumstances.

Keywords— IoT, Women protection system, Wi-Fi device, Server, Open source technology.

I. INTRODUCTION

The human life is repercussion with Internet of things deliberately or unintentionally. Now a day's most of the machines are self-restraint with internet. Uttermost of the women are confined to their homes by reason of barren security [1]. Harassment, molestation and attacks over the women are evenly rising. The crimes contrary to women may be perpetrated either by family members or the person who is unfamiliar. In India, misdemeanour contra to women is boosting with the economic growth. The women in the

utmost cities with ample population still strife in the mien of security.

To safeguard the women the accomplishment of technology is a must. Based on the raised argumentation there is a contend for facilitating security for women. To persuade safety for women in their corresponding work places the Government has taken persistent measures in laws to decline the rate of atrocity [2].

The Internet of things is an environment of physical entities which commutate over the internet. The devices and systems with the ease of internet facilitate transfer of information over a connected network. IoT is familiar to bid connectivity amidst devices and systems and facilitates services so as to influence the performance. The developed women protection system ensures the women in the aspects of tracking, recording and self-defence.

II. LITERATURE ANALYSIS

A women safety device is implemented which facilitates a cautionary alerts to the police by imparting the location when victim has been offended and police can take paramount measures [3]. There is a restraint in this system is some time is needed by the police to reach the victims location.

A low cost device which is adhered to the footwear. The device is automated by tapping the footwear a desired number of four times [4]. The GSM device employed with the microcontroller send the information via SMS to the desired persons. The data of walking and tapping the footwear is examined and determined by the Bays classifier. With the aid of Bays classifier accuracy of data is sustained. The restraint in this system is high data manipulation by the microcontroller is absurd.

A prototype which intends a mechanism to share the location via a GPS and GSM modules. The victim asserts a switch then the device sends a SOS text message and voice messages with the updated locations [5]. The restraint in this

SALA-An Integrated Framework for Speech Recognition Using Lexical Analyzer

B. Sujatha^{#1}, B. Vanajakshi^{#2}, K.N.Nirmala^{#3}

^{#1}Professor, Dept. of CSE, Godavari Institute of
Engineering & Technology (Autonomous),
Rajahmundry, Andhra Pradesh

^{#2}Professor, Dept. of ECE, S.R.K Institute
of Technology, Vijayawada, Andhra Pradesh

^{#3}Assistant Professor, Dept. of CSE, BVC College
of Engineering, Rajahmundry, Andhra Pradesh,

¹bsujatha@giet.ac.in

²vanaja2birudu@gmail.com

³nirmala.bvc@gmail.com

ABSTRACT - First and foremost method of communication between humans is through speech. Speech is the most powerful communication tool if it is used in an appropriate way. These days English has become the most prominent and most used language for interaction between literates. Good communication is possible only if vocabulary of the preferred language is used appropriately. We have found need of a system which analyzes the vocabulary used in the spoken audio which is referred to as speech. This system developed an Integrated Framework for Speech Analysis using Lexical Analyzer (SALA). This system is used in several areas of concern such as in teaching, employment, communication skills, one's dexterity in English vocabulary. The proposed SALA takes input an audio which consists of English speech. This audio is parallelly recorded and also converted into text and is passed through tokenizer and lexical analyzer, then compared with GSL to create a report of the vocabulary levels used by the speaker in the input audio. This system uses the most popular Speech to Text Conversion to analyze the speech which is a peculiar branch of Artificial Intelligence.

Keywords: Speech analysis, Lexical Analyzer, Tokenizer.

I. INTRODUCTION

Speech is the natural and basic style of communication for each person. Communication is a necessary ability to possess in each facet of life for both skilled and private aspects. Crosling and Ward etal [1] discussed speech communication is the persistent and authoritative role of language and communication in society. It is concerned in no matter we have a tendency to do, the higher your communication skills are, the higher others will perceive you. Communication skills are essential for prospering career of an individual. In this competitive world, communication skills are the foremost required quality of an informed person. For every person; reading, writing and listening are the three most important communication skills. We should adapt to reading and writing with our growing age and awareness. With these qualities, it's achievable to develop communication skills and writing skills.

Study carried out by Crosling and Ward in 2002 reveals that companies underline the significance of communication skills in the jobs face and emphasize that University courses which focus on Oral skills are regarded to be the appropriate. However the undergraduate students expect from the teachers to give them the communication skill set. Should have a score beyond the given syllabus

and have a supplement that by several activities and studies. This must be designed such that the student should indulge himself in learning and enhancing his communication skills [2] any sort of formal or informal relationships are built on the footprints of communication. It's a spoken language and if we aren't careful regarding it, it will spoil any reasonably formal or informal relationship, notwithstanding what profession you've got opted; communication is that the most essential part and parcel of your career. Communication skills don't seem to be solely required in day - day life, however conjointly needed in profession, in office and in business. Developing communication skills will facilitate several aspects of your life, from your skilled career, to social gatherings and even to your family life. In today's agitated world, we tend to swear heavily on sharing data, leading to bigger stress being placed on having smart communication skills. Smart verbal and written language skills are essential so as to deliver and perceive data quickly and accurately. Technical students notice the importance of human action in English in each sphere of their life [3]. Having the ability to speak effectively may be a important life ability and may not be over-looked. This is often an application wherever you'll assess your own speech; you'll synthesize your own speech and even compare with others. Communication is the practice by which individuals share their data, views and feelings. Individuals sharing their views could contribute to the operations of groups and therefore the work of people. Communication is a 2-way activity between two or more people. Transfer of information and then knowledge from supply to receiver. It's the method by that the sender/supply reach the receiver/ destination with thoughts, ideas, feelings, facts & values. In communication is claimed to be accomplished once the receiver not solely receives the message however conjointly settle for, interpret and use it within the manner meant by the supply. Communication is the art of transmission data, concepts and attitudes from one person to a different. Communication is that the method of purposeful interaction among individuals. Employers have demanded quite simply qualification. As mentioned by Ezihaslinda et al. (2011) and Crosling and Ward (2002), the flexibility to speak orally in English has become a vital attribute that employers wanted in their potential worker [4].

The differentiation among humans and animals is by the way we transfer ideas through communication. The