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# E Z I N E

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VOLUME 10 | ISSUE 2 | SEPTEMBER 2019

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## DID YOU KNOW?

**Machine learning, reorganized as a separate field, started to flourish in the 1990s.**

# GRADUATE ATTRIBUTES

1

**ENGINEERING KNOWLEDGE:** Apply Knowledge of Mathematics, Science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

2

**PROBLEM ANALYSIS:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3

**DESIGN / DEVELOPMENT OF SOLUTIONS:** Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

4

**CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS:** Using research based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

5

**MODERN TOOL USAGE:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

**THE ENGINEER AND SOCIETY:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice

6

7

**ENVIRONMENT AND SUSTAINABILITY:** Understand the impact of professional engineering solutions in societal and environmental context and demonstrate knowledge of and need for sustainable development.

**ETHICS:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

8

9

**INDIVIDUAL AND TEAM WORK:** Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10 **COMMUNICATION:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

**LIFE-LONG LEARNING:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. 11

12 **PROJECT MANAGEMENT & FINANCE:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments

# PROGRAM SPECIFIC OUTCOMES

**PSO-1** To develop the culture of augmenting existing technologies to create scalable IT solutions.

**PSO-2** To combine various technologies like IoT,Cloud and Analytics to provide integrated solutions to real time problems of government or industries.

**PSO-3** To master in moulding any problem into a web or internet based solutions.

# INDEX

EXPERT TALK

PARENT'S FEATURE

OUR ACHIEVERS

EZINE COMMITTEE

CODE OF ETHICS

# DEPARTMENT OF INFORMATION TECHNOLOGY

## ABOUT THE DEPARTMENT

**The department of Information and Technology,started its journey in the year 2002 and is commited to deliver the program with rigor and with active industry participation. The Department has 120 seats as lateral entry at 2nd year for engineering diploma students. The department believes in student centric approach.**

**Its dedicated team of faculty members inculcate relevant knowledge, skills and attitude in students to become successful professionals. The U.G. programmes is accredited by NBA, New Delhi for three years w.e.f. 16.09.2011. UG programme has been re-accredited for 3 years by NBA w.e.f. 1st July 2016. Also the programme affiliated with UOM since AY 2015-16 onwards.**

## VISION

"The department of IT will strive to be at the top position among the renowned providers of IT education"

## MISSION

The IT department is committed to enrich students by rigorously implementing quality education with a focus to make them industry ready, while imbibing in them professional ethics and social values to become responsible citizens.

# FOREWORD

# From the Dean's Office

Dear Readers,

"Engineers are one of the most integral tools in the development of a society as a whole. Thus, we, here at TCET, dedicate ourselves to providing the students with all the knowledge and resources and help them build with the required abilities so that they may become extraordinary engineers and also, diligent citizens of our country.

This time as the 2nd issue of 10th Edition of the Ezine is being put forth, I would like to acknowledge the contribution that the students, faculties, alumni and parents have made towards making the Student's Magazine possible. Like its previous editions, Ezine X serves as a platform for students to research, hone and share their technical knowledge and skills and also showcase their achievements in not only academia, but a wide spectrum of fields. Furthermore, the magazine also showcases the activities conducted by both department and institute to ensure a versatile development among students. Ezine strives to serve as a beacon of inspiration to students to enable them to aim and achieve higher, it is not just about academics. We, at TCET believe that learning is a life-long process - and this is exactly the principle that we, through Ezine, want to inculcate amongst our students. Thus, Ezine is our little contribution towards the betterment of society."

Dr. Kamal Shah
Dean, R&D cell

# A Message from the HOD

Dear Readers,

Leading the IT Department gives me immense amount of pride and pleasure. In over 1.5 decades since our journey began in 2001,we have grown our expertise and competence in the field of IT curriculum and research. The Department comprises of strong programs to offer in IT including B.E, M.E and Ph.D. programs.

The department is working hard towards achieving its goal of providing quality and innovative education with high standards to achieve academic excellence. The primary focus of our curriculum is to hone student's technical knowledge and problem-solving skills to an utmost level, and impart technical know-how about new-coming technologies. Many platforms including ABL,TBL are offered providing a wide spectrum of options for students in order to help them choose and pursue their interests. Our department maintains active research domains for carrying out collaborative and interdisciplinary research. The faculty members also dedicatedly contribute in solving technological challenges of the society with active participation from all stakeholders. "Nothing can be achieved without genuine effort". The department consists of experienced faculties all of which are dedicated towards teaching, research and making a difference in the lives of students. In a nutshell, the faculties in our department are striving hard towards shaping up the students not only to make them globally competitive technocrats, but also the good Samaritans of our country. I hereby congratulate the whole team of faculty members and students for their hard work, dedication and efforts.

Best Wishes!!

Dr. Rajesh Bhansode
HOD,IT

# A Word from Faculty In-charge

*"A reader lives a thousand lives before he dies . . . The man who never reads lives only one."*

*-George R.R. Martin*

Dear readers,

E-zine provides a platform to the students and faculty members to showcase their knowledge by publishing their technical articles. E-zine is a medium to present knowledge within an individual to the world.

This semester, students have almost completed their project work and hence the knowledge gained from completing the projects and gaining the hands-on experience has led to vast experience of carrying out a project. Most of the articles in this edition of E-zine are based on the research work carried out by students during the entire year.

On behalf of the editorial team I thank the management of Thakur College of Engineering and Technology for providing such a wonderful platform for the students and faculty members.

Also many congratulations to the editorial team for putting efforts into the creation of E-zine.

Mr. Aaditya Desai
Faculy In-charge

# PREFACE

**Dear Readers,**

It is the innate tendency of a human beings to expand their horizons. Everyone wants to be a bit more of what they are today. There are various paths to it. Some travel, some watch movies, some may do it through means of knowledge. This magazine is the culmination of our longing to broaden our horizon through the power of knowledge.

I would also like to take this opportunity to thank Mr. Jigar Halani and Mr. Vikas Jalan for giving us their precious time and knowledge for our interview.

All the authors have done a commendable jobs - Students, Faculties, Alumnis and Parents, who contributed to the magazine, without them Ezine shall not exist.

I also thank the Faculty-in-charge Mr. Aditya Desai and our HoD, Dr. Rajesh Bansode who were always optimistic and believed that this team could handle this task.

I would also like to extend my gratitude towards the teaching and Non-teaching staff who were always very helpful to us during any problems.

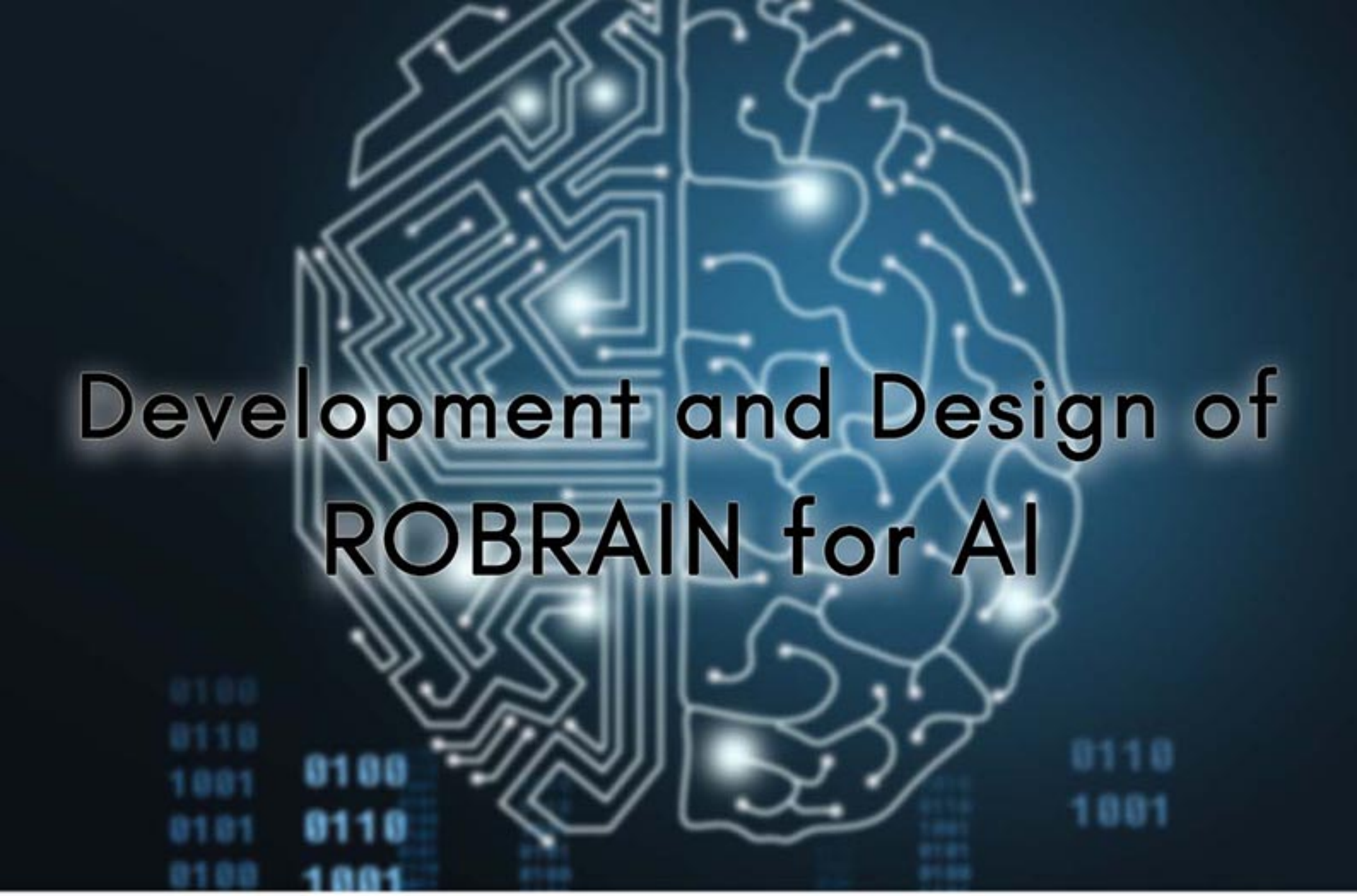
Lastly, my gratitude towards my team who patiently listened to my requests and delivered the needful, whenever needed.

Sincerely,

Divyam Choudhary,
EDITOR-IN-CHIEF

# STUDENTS'

# TREATISE




The current technical world is growing more towards Artificial Intelligence and Machine Learning based solutions for real life problems, but wait! What about the data that we are generating for attaining Machine Learning? There is no limit to that data, hence there is no limit of space for such data.

In this era of Artificial Intelligence, demand arises for most efficient, secure and never ending solution for storing and retrieving data faster than anything. Yes you heard it right, a never ending solution; can you think of any such technology?

Well, you are very close, it is our brain, yes a human brain is capable of storing data with no limit and retrieving the same faster than machines can do. But in order to use the concept of human brain lively in Artificial Intelligence we need to understand the concept of memory. Memory is the one of the most complex processes of the brain. Structures and processes involved in the storage and retrieval of information are necessary for you to exist in the world. But how does it work? Let's find out.

Human memory is most complex version of memory on Earth. So, let us explore it in depth, just because if you are able to implement a human brain-like structure in robotics then this would be biggest revolution in the field of Artificial Intelligence, isn't it? As per the research of Karl Lashley and Wilder Penfield in 1950's and 1960's, long term memories are stored entirely in brain as a or in group of neurons that are destined to fire together in the same pattern that created original experience or effect.

Now at the cellular level, data is stored as functional and structural changes at the synapse, the junction that connect neurons in brain. In our brain, the hippocampus is an area where the concept of storing long term memory works. The brain is able to store information by strengthening and weakening of the Synapse.

As of now one of the biggest problems while building robots is to provide them with the feelings same as humans. This can be overcome by using the idea of robrain. By applying the concept as explained above we can develop a custom brain, closely similar to human brains and rather make use of them in field of Artificial Intelligence. The problem related to data management will be eliminated to great extent and the efficiency of robots will be enhanced greatly with this new and effective idea of robrain.

Vishal Maurya
FE IT B
GAs: 1,2,3,4,6,10,11


"ML never makes the "perfect" guess, because ML deals in domains where there is no such thing. The goal is to make guesses that are good enough to be useful"

In the last few years, the concept of Machine Learning was a dream, but now these technologies are evolved from being a niche to becoming a mainstream. It is the scientific study of algorithms and statistical model. Machine Learning tasks are classified as:

- Supervised learning tasks
- Semi-supervised learning
- Active Learning
- Reinforcement learning
- Robot learning
- Meta learning
- Unsupervised learning

## HISTORY

The term Machine Learning is coined by an American pioneer in 1959 at IBM. Earlier, some researchers wanted machines to learn from data. They attempted the problem in various symbolic methods , where probabilistic reasoning was especially employed in automated medical diagnosis. It is reorganized as a separate field around 1990s.Later on it shifted focus away from the symbolic approaches it had inherited from AI. It was the reason behind increasing availability of digitized information.

## APPLICATIONS

- Agriculture
- Anatomy
- Machine translation
- Marketing
- Robot locomotion
- Search engines
- Speech recognition
- DNA sequence
- Time series forecasting

## REAL LIFE EXAMPLES

- In 2006, Netflix held the first "Netflix Prize" competition to find a program which will predict user preference and improve accuracy.
- In 2010, The Wall Street journal wrote about the use of Machine Learning in to predict the financial crisis.
- In 2012, Vinod Khosla , co-founder of Sun-Microsystems, predicted that 80% of medical doctors' jobs would be lost in the next two decades to automated machine learning medical diagnostic software.
- In 2014, the report issued that machine learning is used in the field of art history to study fine arts.

## LIMITATIONS

Sometimes Machine Learning lags to give expected results lack of access to suitable data, privacy problems, lack of resources and evaluation problem. For Example: In 2018, a self-driving car from Uber failed to detect a pedestrian, who was killed in the following collision.

## CLASSIFICATION PROBLEMS IN MACHINE LEARNING(SUPERVISED)

Regression Machine Learning systems: Systems where the value being predicted falls somewhere on a continuous spectrum.

Binary Classification machine learning systems: Systems where prediction is done on two bases : Yes or No.

## IMPORTANT TRENDS

1. Provide smart visualisations and insights.
2. Finding/Binding/Extracting better features for dataset.
3. Building more powerful predictive models.
4. Bridging the gap between black box and productionisation.
5. Facilitating productionisation.

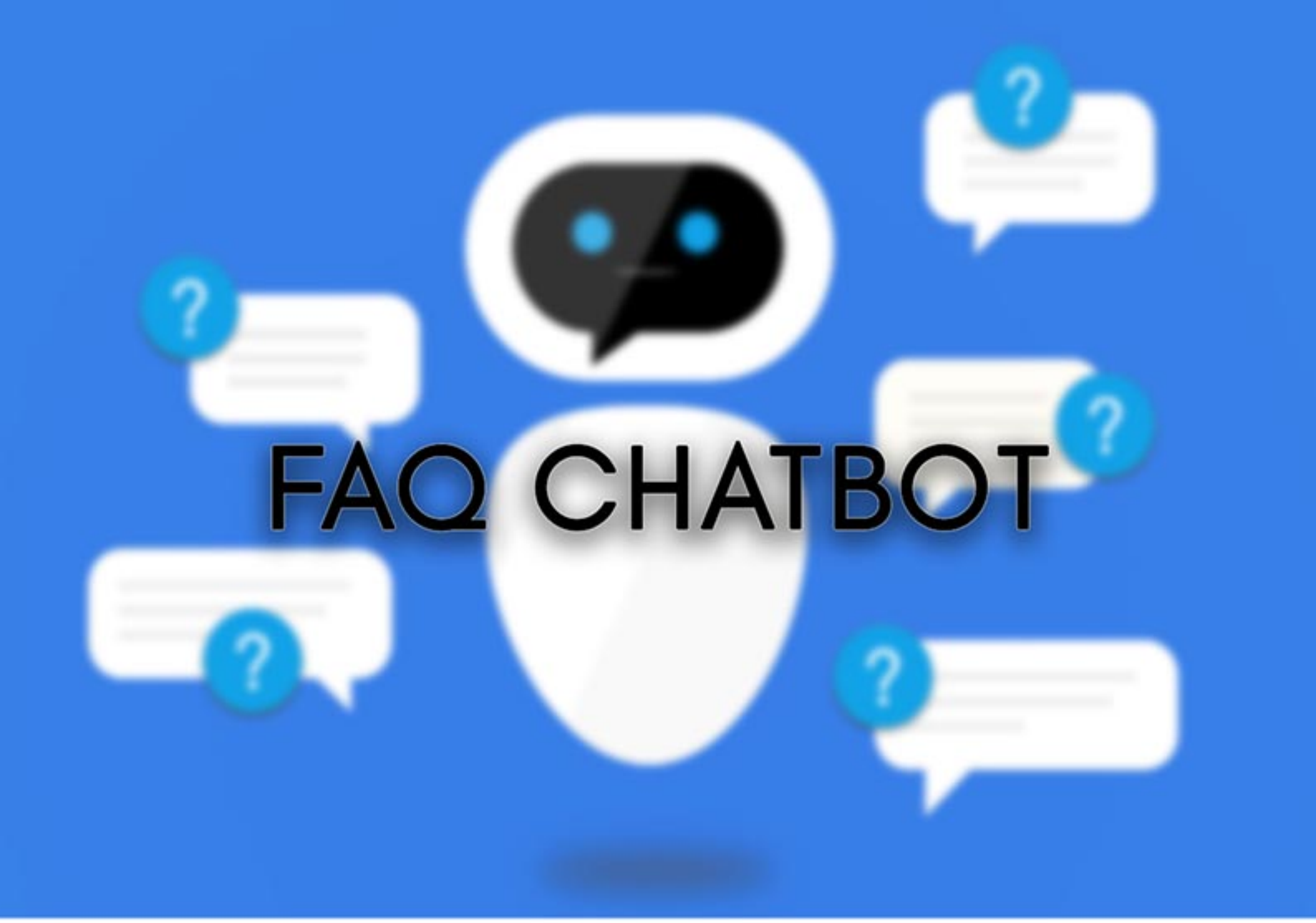
## SOFTWARES

- CNTK ELKI
- Deeplearning Keras
- Mallet Mlpack Neural lab Orange ROOT
- Weks / MOA Yooreeka
- R

*"A computer program is said to learn from experience E with respect to some task T and some performance measure P, if its performance on T, as measured by P, improves with experience E."*

– TOM MITCHELL , CARNEGIE MELLON UNIVERSITY

Vikas Tiwari
FE IT B
GAs:1,3,6,8,10,11




First, it is necessary to study the importance of these chatbots and why do we need them, but before stepping into these things let's find out how the term 'chatbot' came into existence.

## HISTORY

Alan Turning was the first person who laid the foundations for the 'chatbot' revolution. We may think that the term 'chatbot' has been introduced recently but it has a longer history then we may expect. The first chatbot was invented at a MIT AI laboratory in 1966; the name of that Chatbot was ELIZA. It was built to stimulate human conversation by matching user prompts to scripted responses. In the coming years more chatbots came into existence and chatbot technology started gaining momentum. Now as we know many big companies like Google, Apple, etc. have launched their respective chatbots. For example, Apple has Siri, Amazon has Alexa, Microsoft has Cortana, etc.

## Let us now discuss – why do we need a chatbot?

So, what do we do when we need any information? Simple: "We Ask, and Google Tells". But sometimes this doesn't work i.e. for a single search there can be multiple results and to get the required result (the result we may need), we would have to search for information available in bits and pieces and then try to filter and assemble relevant parts together. Sounds time consuming, doesn't it?

The solution to this is a 'chatbot'. Chatbot can provide such information in a natural and conversational way. We simply have to tell the Chatbot our problem and it can provide us a solution in a more user friendly way. Chatbot not only makes the searching process interesting but it also saves a lot of time and is comparatively more accurate then search engines that is the major advantage of a Chatbot.

Previously it was very difficult to build a Chatbot with a proper framework using AI and Machine Learning because of the technological and human limitations as we did not have proper knowledge about the things that can be achieved through AI and Machine Learning. But now everything has changed and there are chatbots which can perform a large amount of our tasks in a more efficient manner.

For Example - 'ALEXA' which is a chatbot developed by Amazon can perform a lot of our tasks like reading news, ordering dinner, etc. (Yes, it is true we just have to name the restaurant and the dish and food will be delivered at your doorstep. That's how simple it is!) We can also connect our smart devices with it converting ALEXA into a home automation system! It has a lot of different functions that can be interestingly explored.

## Future of Chatbots:

1. Advancements in AI development in chatbot:

There will be significant advances in AI development due to a large amount of conversations a Chabot will perform with the user. Although there are very limited ways of validating the answers, we will see a large number of advances in AI that can improve the conversational capabilities of the chatbot.

2. The Voice Experience:

Recently the Voice Interface has had huge advancements due to the work of the Big maestros like Amazon and Google. According to the statistics, Amazon has sold over 100 million Alexa devices whereas Google is trying to make its 'Google Assistant' available on Android devices.

3. Chatbot influence on Customer Care services:

Chatbot will gather customer insight so they can improve all stages of the marketing funnel. Chatbot will store the information about the type of questions asked by the customer. It will answer the question with the help of previously stored data by reading a large amount of information in a small amount of time, and then it will predict the user's action. It will continue the conversation if needed or resolve the query at the best possible speed.

4. Cost of Chatbots will decrease:

Companies will give access for the development of chatbots according to the customer preferences, which will be simple by the use of an app. The user will need less or no programming to develop a chatbot. Due to such advancements, the competition arises, which will in turn lower the prices/cost of the chatbots. Companies need to do so to remain on the top.

In the longer term, as technology continues to evolve, more AI and speech-based bots will enter the market. Bots will also be able to do more, such as process payments, diagnose illnesses, manage your finances and ultimately understand how you feel. Chatbots are entering everywhere and there are sure to be even more milestones on the way.

Roshan Kewat
SE IT A

Shubham Maheshwari
SE IT A

Nevil Kaspale
SE IT A

GAs:1,3,4,5,6,8,10,11


In day to day life we receive many suggestions from various apps like what to buy or where to go for holidays or which movie to watch etc. This is nothing but an implementation of recommendation system. The recommendation engine filters data using various algorithms and recommends the most relevant items for users.

Steps to build recommendation system:

1. Data collection: As recommendation system is an application of machine learning, data plays an important role. Data can be collected in many ways such as:
   1. Through feedback forms
   2. User activity
   3. Search history, likes etc.
2. Data storage: The amount of data indicates how good the recommendations of the model can be. More the data, more accurate the recommendation is going to be. Data collected must be stored for use in algorithms and making recommendation systems. We can use SQL database, NoSQL database or simple files.
3. Data cleaning: Data collected may not always be in the required format so we may need to use data cleaning techniques to bring data as per an appropriate format.
4. Apply to Algorithm:
   1. Content based filtering

   In this Algorithm, user is given recommendation from his/her own activity and not by any other users activity. For example, user A watches action movies then he will be shown recommendation of action movies only. It is likely to be highly relevant to a user's interests. It is comparatively easier to build than collaborative filtering.

   2. Collaborative filtering

   In this Algorithm, user is given recommendation referring to activities of similar users. E.g. user A and user B both like playing cricket and user B likes to buy electronics, then system will recommend user A to buy electronics . Standard algorithm is Nearest neighborhood. Collaborative filtering systems work by people in a system, and it is expected that people to be better at evaluating information than a computed function.

   3.Hybrid

   Hybrid filtering technique is a combination of multiple recommendation techniques. Both Collaborative filtering and Content based filtering have their own benefits and demerits

therefore if we combine both of them together then the benefit of both can be used to overcome the demerits of others. Accuracy is more in Hybrid than above 2 methods.

## 5. Where is Recommendation System used?

Everywhere where you see related suggestions

1.Amazon: Amazon uses Recommendation system to recommend their users what to buy based on their past activity.

2.Netflix: Netflix suggests you which movie/show you must watch next based on your recent and past history.

3.Youtube: YouTube suggests you next video to watch on basis of your history, likes and types of video you have watched previously. Recommendation systems are a powerful new technology for extracting additional value for a business from its user databases. Recommendation systems benefit users by enabling them to find items they like. Hence, useful for both users and business.

*"We are leaving the age of information and entering the age of recommendation."*

Amey Tendulkar
TE IT
GAs: 1,2,3,4,5,6,7,8,10,11,12


*A technology that is synonymous with Big Data, Hadoop is in high demand.*

Imagine, if you ever wanted to store a file having a size larger than your PC's storage capacity. There is no way you could do that, right? What if we told you that you could store files bigger than what can be stored on one particular node or server? With the advent of concept like Big Data and platform like Hadoop, it is possible to store very, very large files and many, many files.

The world, as we know today, is turning digital and with this digitization the amount of data being created and stored is exploding. This data, either structured or unstructured, can be garnered from various sources like social media, data from internet-enabled devices, machine data etc. Almost 5 Quintillion Bytes of data is generated daily. Hadoop is an open source software based on Big Data technology, written in Java, that enables processing of a very large amount of data by distributing these sets of data across different cluster of servers. It is designed to scale up from a single machine to thousands of machines, and each of these machines offer local computation and storage.

## Economics of Hadoop:

Big Data comes at a Big Cost. Hadoop is not only Big Data platform in the industry, but it has created a buzz all around in a short span of time.

For Hadoop, the most important rational motive within the market is simple: Before Hadoop, data storage was expensive. Hadoop lets you store any amount of data, structured or unstructured, simply by adding more servers to a Hadoop cluster. These servers are x86 based machines which come at relatively low cost and add more processing power and more storage to the overall cluster. This makes data storage with Hadoop far less costly than its competitors.

## Future of Hadoop:

It is probably not the right time to comment on the future of Hadoop. The opportunities and the possibilities with Hadoop are endless, but there are still certain points that need to be addressed on a priority basis. For many years currently, much of the hype surrounding big data has been connected with Hadoop. This can be overcome by making Hadoop easier to use and lowering the barriers to adoption and thus more companies may be willing to take

the risk. Moving Hadoop to the cloud can be one good way to solve this particular problem. Hadoop vendors ought to additionally check up on de-segregating huge different information technologies that may complement Hadoop as the simplest way to diversify their offerings. As a technology, Hadoop has a lot to offer and there's a lot of potential for continued growth well into the future.

Amish Punmiya
TE IT
GAs: 1,2,3,4,5,6,7,8,10,11,12

# EMPOWERING MUSICIANS THROUGH BLOCKCHAIN TECHNOLOGY

A blockchain is an expanding list of records, called as blocks, which are linked together using cryptography. Every block contains a cryptographic hash of the preceding block, a timestamp, and transaction data. A blockchain holds no transaction costs. The blockchain is a straightforward yet creative way of passing data from A to B in a completely automated and safe way. A transaction is initiated through a party by creating a block. This block is verified by up to millions of computers distributed around the net. This verified block is then added to a chain thereby creating a unique record with a unique history. This model is used by bitcoin for financial transactions.

## INTEGRATING BLOCKCHAIN WITH MUSIC:

In today's world, the major issues faced by the music industry include clarity of ownership, royalty distributions and transparency. The music industry has been struggling with finding innovative ways to monetize digital music files that have turned into non-scarce digital goods. Data accuracy is crucial to ensuring that owners and music creators get paid for their work. In addition to this, complex system of royalty collections and the outdated copyright databases make it a lot more tedious to get music from legitimate sources. With decentralized applications being built on a blockchain, we use a different protocol, one that uses tokens to incentivize and monetize participation.

The Benefits of Decentralizing the Music Industry:

1. Redistribution of power
2. Improved creativity and motivation for owners, artists and music composers
3. Enables accelerated processing speeds
4. Improved and secure data storage

## APPLICATION DOMAINS IN THE MUSIC INDUSTRY:

Revenue Sharing - Blockchain technology is capable of providing a means for artists to share revenue via a smart contract.

Media Ecosystems - Content platforms similar to GoFundme or YouTube can benefit from decentralization. No central repository distributing content creators will be present. The artists and their fans will be able to exchange digital currency for distribution of audio and funding new projects.

Piracy Prevention - Blockchain technology works to improve traceability across different supply-chains, and this could apply to music distribution. Albums or tracks can be digital assets represented on the blockchain with a virtual watermark indicating copyrighted media. If that digital asset is illegally redistributed or not paid for, it can be traced with ease.

Decentralized Music Streaming Platforms - The blockchain will stop music streaming platforms like Spotify and Apple from hoarding music and providing access on a subscription basis, thereby pressuring both fans and artists into compulsory usage. Cooperatively owned streaming platforms will emphasize on paying artists more and making sure fans pay less using tokenization systems and blockchain governance.

CONCLUSION:

Blockchain applications in the music industry have the ability to revolutionize from production to distribution. More diversity and creativity can be brought to music worldwide through the decentralized model. Fans will no longer be paying money to third-parties or be tempted to pirate on file sharing sites to relish their favourite composers and artists. They will have more access to music and lesser hurdles concealing the artist-fan relationship. As more industries become decentralized, power will redistribute to creators bringing audiophiles and fans more accessible, better content and artists direct profit from their intellectual property and hard work.

**Shweta Sharma**
**TE IT**
**GAs: 1,2,3,4,5,6,7,8,10,11,12**


The human brain can, at times, become a really inspiring source of certain ideas that can take things to the next level. One of the most essential functionality of the same is its ability of stimulation. The ability which takes responses from various parts of the body and gives them an idea of what to do next in context of a certain circumstance. One such way of guiding a state to another progressive state so as to continue with the normal routine of the body is an idea that has been inherited from our brain – the Human Intelligence, and made into a more controllable form known today as the Artificial Intelligence.

Artificial Intelligence stepped into the real world for the first time through a conference held at Dartmouth College, New Hampshire, United States in 1956. This was when and where AI settled itself as a field and as a medium for scientists to work projects that follow this simple assertion, given at the conference itself: "Every aspect of learning or any other feature of intelligence can be so precisely described that a machine can be made to simulate it". The intention of any Artificially Intelligent machine was to translate the human thinking or "description" of any particular entity or a task into a corresponding machine language that simply doesn't shuffle through all 0s and 1s but effectively understand the methodology of why or how it is computing those symbols. The history of AI has had its own set of accomplishments and set of downfalls, both in terms of research and monetary matters. Profusely, AI set some very high standards on an international level. The researchers were gradually recognized across the world and they were even funded by some of the countries across the sea!

Artificial Intelligence is a term that, despite consisting of only two regular words, serves as an entrance to a completely new division of emerging technology. Artificial Intelligence or AI as more popularly acknowledged by the masses, has been enabling us to take a step further with various inventions pertaining to development of such machines that not only have the ability to work but also think by themselves and produce the expected results, reducing human requisite. The more we dig deep into the world of AI, the more possibilities come out of the burrow of ideas. The possibilities are endless.

Aditya Nambiar
TE IT A
GAs:1,3,6,8,11


The Smart Bag using IoT provides a solution to numerous things which include right from giving an alert about the items if left outside the luggage to allowing it to track its location just in case goes missing. The concept of smart luggage was implemented to give the passengers a relief from worrying about their luggage but to worry about their journey. It inculcates various features.

The Smart Bag project mainly focuses on safety and the proper reach for their passengers.These help in them keeping their belongings safe and within a desired range of area. It is a concept that is a requirement of the hour for people who are on a tour or on a long run journey.

Introducing this concept will help the passengers keep a track of their baggage within a range which they specify and if the range exceeds the limit provided it would lead to an alert to the owner. This would help in its safety.

The survey for the project was conducted through a Google form where it people were asked to fill some multiple choice questions along with some suggestions if any. These questions covered various topics starting from the number of times people travel from one place to another to their usage of baggage, the threats and risks involved in carrying huge luggage and the rating or the thought about the concept of smart bags and its features.

This smart bag consists of an in-built circuit which provides mobile battery to an individual at a cheapest cost possible. Battery will be charged and can be utilized to charge electronics devices when required whether it is smart phones or laptop or any other device. Additional features have been added to facilitate students to not to forget carrying textbooks as per college/school time tables. RFID has been used to make sure all books are present in the bag. If there is any missing book from the time table, the student will be notified.

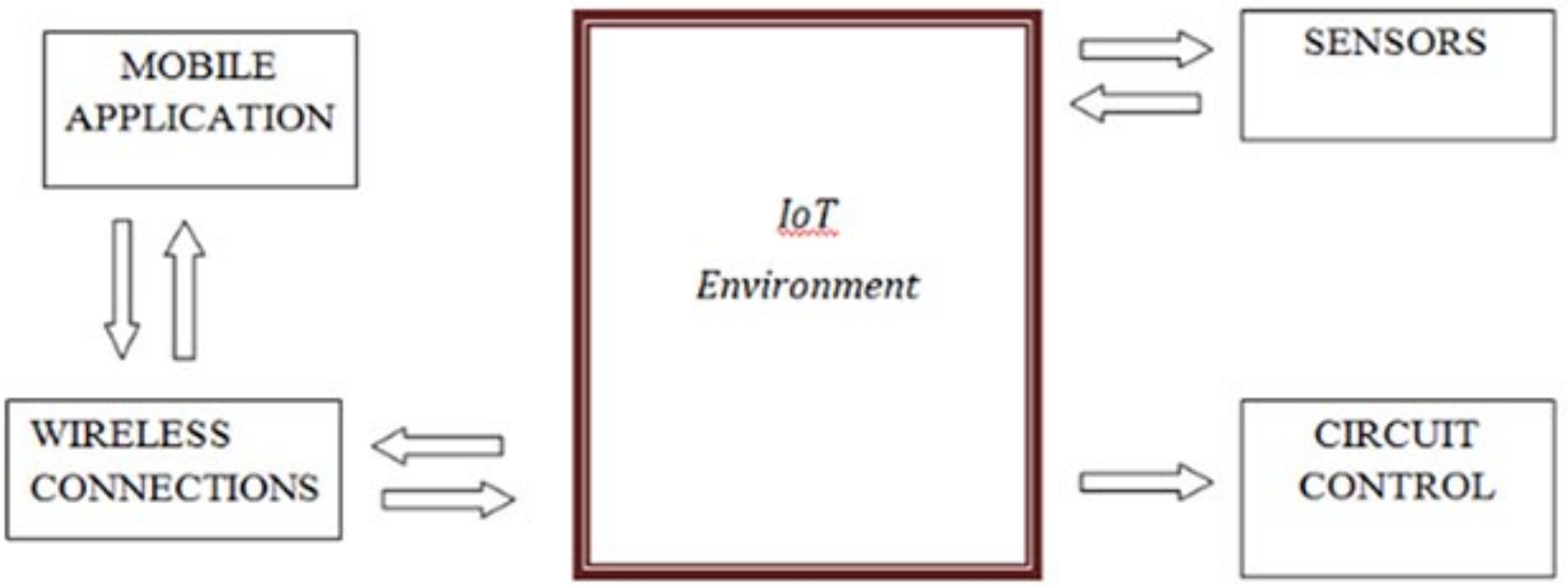



*Fig1: Block diagram*

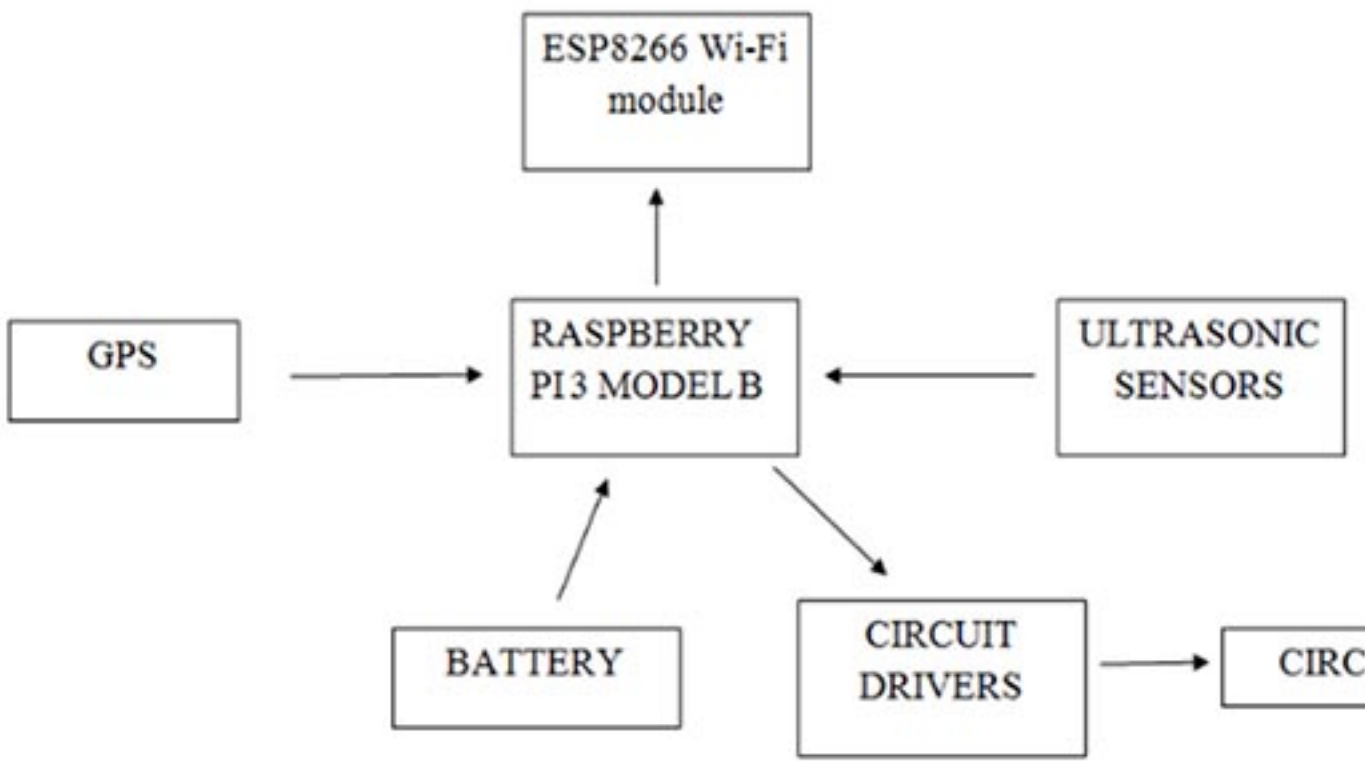



*Fig2: Flow Diagram*

In future, we are planning to include some interesting features like automatic object avoidance, staircase climbing and some extra woman safety features. These extra features make the bag more powerful and user friendly.

This project idea shows the implementation of tracking the bags which are either lost or stolen using IoT. Certain procedures and techniques have been made and proposed in order to achieve the same. Experimentation has been done and maps have been created in order to track the location of the bags which are misplaced and lost. Experiment results further concludes that the bags can be easily tracked based upon the hardware installed in them and then by tracking that hardware and tracking the route, directions and location of the bag can be determined with the help of a map.

Sneha Jaiswal
BE IT A

Akshara Lagwankar
BE IT A

Payal Borchate
BE IT A

GAs:1,2,3,5,6,7,8,12


The project aims at building a face detection system to see the intensity of drowsiness in drivers though system which can be embedded into vehicle system for detection of drowsiness while driving. In the past the number of road accidents has increased by road-side vehicle drivers. The primary reasons were found to be mainly because of inability to see and inattentiveness. With past studies and researches it has been of major concern to develop a system which could help drivers while driving. A lot of papers have been published with real time model having drowsiness face detection embedded in them. Amongst them are BMW with Driving Assistant plus. Ford with Active city stop etc.

## Background

According to the research conducted, this system of vehicle safety helps to reduce and prevent road-side accidents by alerting drivers from getting drowsiness. This project effectively involves studying the drivers' patterns viz. his physical and behavioral patterns which effectively get driver from becoming drowsy. Some of the existing system use steering pattern monitoring, vehicle position in lane monitoring, driver eye/face monitoring etc. The systems available Audi with rest recommendation system, BMW with active driving assistant with attention which analyses the driving pattern which employ graphic symbols. Bosch which takes steering sensor, front mounted lane assists camera vehicle speed turning signal stalk and may other systems available in the list. Ford using driver alert, Honda available with Driver attention monitor Hyundai with its latest Driver Alert system i30. The model is expected to be implemented in OpenCV python and open-source but as an alternative and ease of language and availability of resource other languages are also used as an alternative. It rings an alarm when drivers are found sleeping. This is determined with the help of Famous Jones Viola algorithm also known as HAAR. Through this the images of eye on its location from face is extracted and with the ratio of blinking proportional to time in terms of delay. The overall aim of the project is to improve efficiency in building the system and reducing the number of road-accidents.

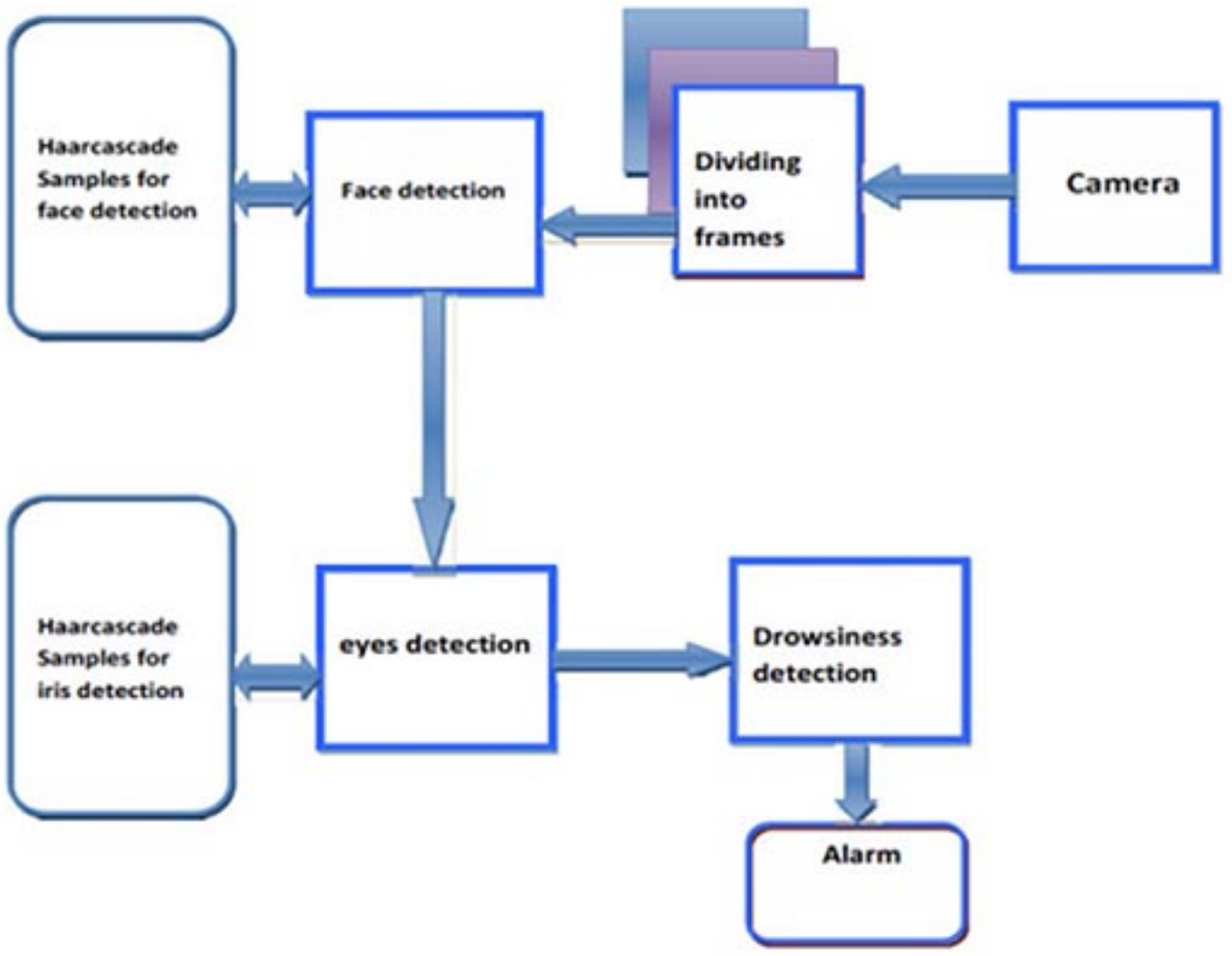



*Figure: Proposed System Architechture*

## Implementation of the model:

### Video Acquisition

OpenCV provides extensive support for acquiring and processing live videos. As mentioned earlier, OpenCV does not specify any minimum requirement on the camera, however OpenCV by default expects a particular resolution of the video that is being recorded, if the resolutions do not match, then an error is thrown. This error can be countered by overriding the default value.

### Dividing into frames

Once the video has been acquired, the next step is to divide it into a series of frames/images. This was initially done as a 2 step process. The first step is to grab a frame from the camera or a video file, in our case since the video is not stored, the frame is grabbed from the camera and once this is achieved, the next step is to retrieve the grabbed frame. While retrieving, the image/frame is first decompressed and then retrieved.

### Face detection

Once the frames are successfully extracted the next step is to detect the face in each of these frames. This is achieved by making use of the Haarcascade file for face detection. The Haarcascade file contains a number of features of the face, such as height, width and thresholds of face colors. It is constructed using a number of positive and negative samples. After loading the cascade file apply edge detection function to detect all possible types of frames. The output of this module is a frame with face detected in it.

### Eye detection

After detecting the face, the next step is to detect the eyes, this can be achieved by making use of the same technique used for face detection. However, to reduce the amount of processing, we mark the region of interest before trying to detect eyes.

### Drowsiness detection

Once the eyes are detected, the next step is to determine if the eyes are in closed or open state. This is achieved by extracting the pixel values from the eye region. After extracting, we check if these pixel values are white, if they are white then it infers that the eyes are in the open state, if the pixel values are not white then it infers that the eyes are in the closed state. If drowsiness is detected, a text message is displayed along with triggering an audio alarm.

The system was tested in different conditions and it was found that the system does not function effectively if driver is found to be wearing any kind of spectacles or if light is falling directly on the camera.

## Conclusion:

The aim of this project is to implement a system which could detect level of drowsiness in the person driving the vehicle. The techniques used for implementation are image processing, vehicular based and the one implemented is image processing based consisting of 5 modules namely video acquisition, dividing into frames, face detection, eye detection, and drowsiness detection . Each of these components can be implemented independently thus providing a way to structure them based on the requirements.

The amount of time taken for processing is considerably low and the results obtained are also efficient and accurate.

## Future implementation of the project:

From future perspective the project can be made implemented directly as standalone application or it can be integrated into an app installed into a smart phone application which can be used later. The automobile driver can start the application after placing where the camera is focused on the driver.

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GAs:1.2.3.5.6.8.10.11

# SMART WASTE MANAGEMENT IN CITIES USING IOT

Today, in the 21st century where the human population is growing at a faster pace every second and with people prioritizing their luxuries in life, they are overlooking the amount of damage they are doing to the environment. The human race is itself creating hazardous situations for their upcoming generations. The resources are being depleted day by day and hence there is a great hike in prices.

As of yet, there are no proper sources to measure the amount of garbage that is generated on day to day basis. Parameters such as sensor garbage bins can be allotted to areas for controlling the waste management and through this people in low lying areas can be educated regarding throwing of garbage on roads. If the BMC provides sufficient garbage bins in overly populated areas, it can help to break the unhygienic habits of the uneducated people.

The major motive behind this system was to provide the localities with sensor garbage bins to improve the condition of the garbage in the cities. The results reported were that these garbage bins showed the amount of garbage filled in the bins, if the bins needed to be emptied. The major aspect was that it sent a SMS every time the bins were full and this helped the garbage collectors to know when they had to collect it thus saving time energy and resources. The results that were observed were not similar to the results in the literature survey table. The idea of sending an SMS was what was proposed, but miscommunication was observed at certain levels and approaching people was difficult, but this system will definitely have good results in future.

As the health issues are arising due to growth in pollution due to the population, where people do not think about proper waste management or throw garbage even if the bin is overflowing, we need a solution for it. Factors such as increase in price of fuels impact the wages of the workers. This project will help the authorities to reduce the use of fuels by letting the authorities know about the level of bin via an SMS. So that workers can collect the garbage of that particular bin which is overflowing. This in turn will result in decrease in fuel utilization and lower the factors resulting in health issues.

Our project is based on Internet of things so objectives are:

- Monitoring the waste management.
- Providing a smart technology for waste system.
- Avoiding human intervention.
- Reducing human time and effort

Waste management -though a new area for Information Technology especially in its field of Internet of Things or IoT- is one of the most crucial domains of public service. The purpose of this project is to use a smarter way to manage waste through the advancements in technology. Our product will provide less human interaction with more use of technology to detect the level of garbage and notify it to the authorities. This will decrease fuel utilization and roads will be clear of dirt and foul smell.

This system will be able to detect the level of the garbage and will send the information with location to the authorities for management and handling of the garbage. From waste bins equipped with fill-sensors, to data based management and logistics platforms, the industry is shifting into a cleaner and more efficient part of modern life. The project intends to correctly monitor the level of the garbage or the waste inside the smart dustbin and will provide the information related to the percentage of the smart waste dustbin filled with the help of sensors.

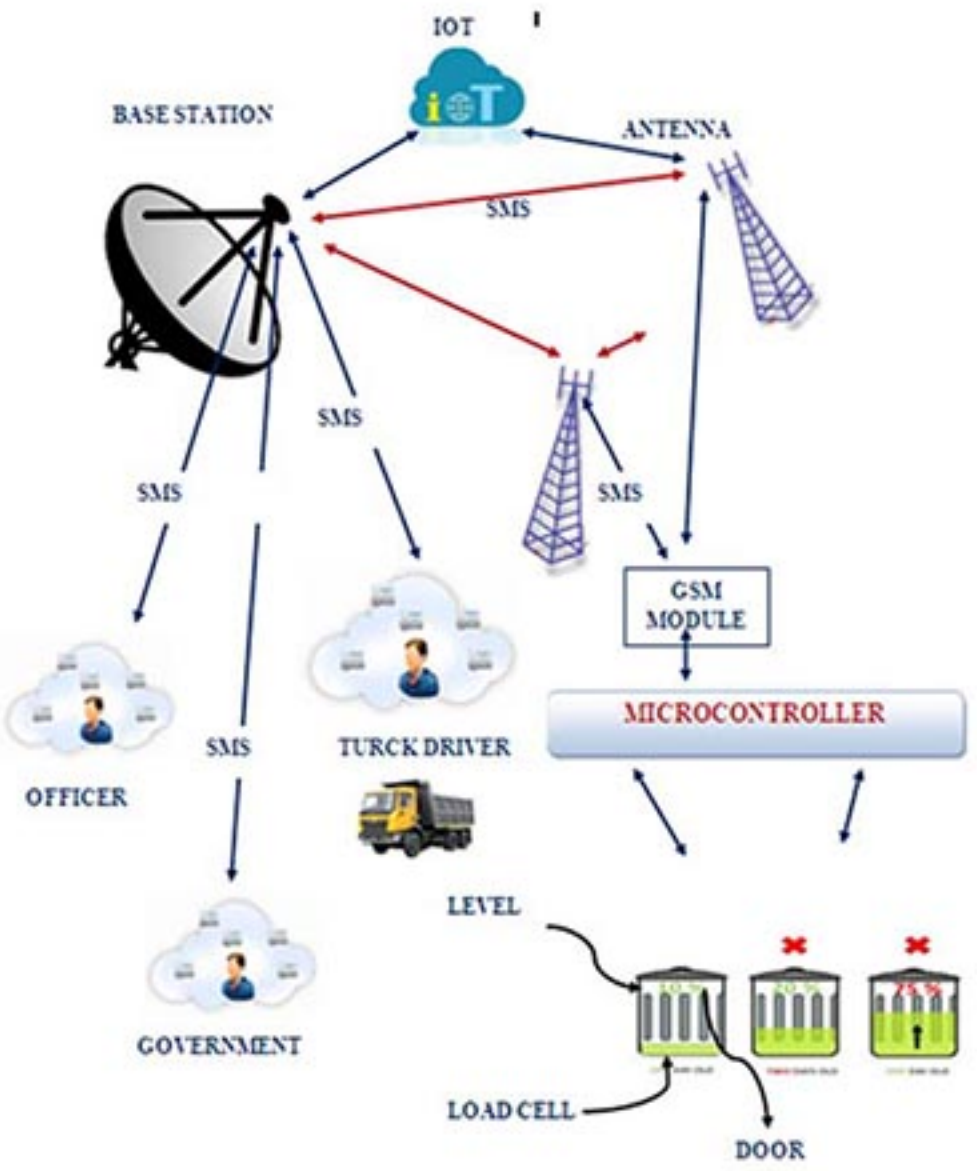


*Figure: Use Case Diagram*

In order to make the cities greener, safer and more efficient, IoT can play an important role. Improvement in safety and quality of life can be achieved by connecting devices, vehicles and infrastructure all around in a city. Best technological solutions can be achieved in smart cities by making different stakeholders to work together. System integrators, network operators and technology providers have a role to play in working with governments to enable smart solutions.


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GAs:1,3,4,5,6,8,11


Diabetes is one of the deadliest and chronic diseases which results in a rapid increase in blood sugar. Many complications occur if diabetes remains undiagnosed and untreated. The tedious identifying process results in a patient paying a visit to a diagnostic center and consulting a doctor. But the rise in Machine Learning approaches solves this critical problem. The motive of this study is to design a model which can prognosticate the likelihood of diabetes in patients with maximum accuracy [3]. Therefore, three machine learning classification algorithms viz. Decision Tree, Support Vector Machine (SVM) and Naïve-Bayes Classifier are used in this experiment to detect diabetes as early as possible. The experiments are performed on Pima Indians Diabetes Database (PIDD) which is sourced from UCI Machine Learning repository. The central parameter of success is the accuracy with which the machine learning algorithm predicts the diseases for which it is solely trained. It is expected to be above 96% - 98% to make a real difference, as medical diagnosis has very rigorous standards. The secondary parameters are the response and loading time of each modules. A high value of module latency can make any user impatient. Besides these two, the other parameter is the number of features that work without any bugs.

Healthcare is a new venture for Artificial intelligence. The Machine Learning domain, remains one of the most crucial domains of public service, one which has been devoted a lot of funding and research [1]. With healthcare, we are possibly looking at the most cardinal and relevant applications of the advanced abilities of Artificial Intelligence as well as Machine Learning. With Big Data rapidly evolving in biomedical and healthcare sectors and communities, an accurate analysis of medical data will benefit in an early disease detection, patient care, and community services [2]. However, the analysis accuracy is reduced if the quality of medical data is incomplete.

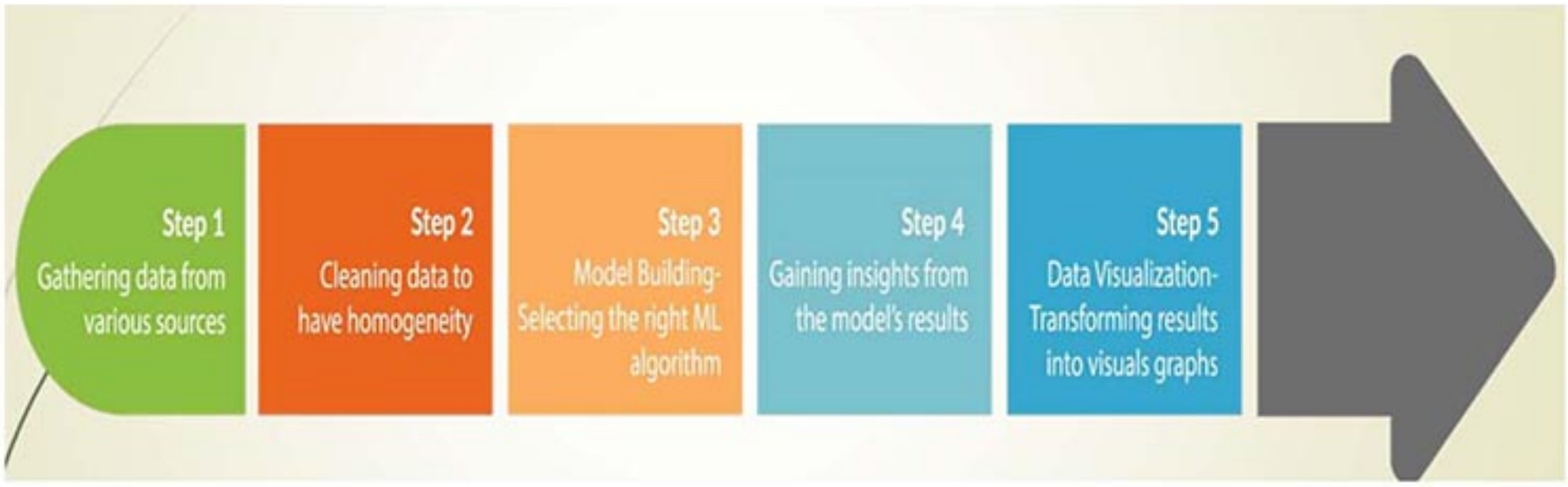


*Figure 1: Working*


*Figure 2: Classification*

The model and the algorithms used are structured and developed using Python as the main programming language and makes uses of its libraries like SciKit, NumPy, Flask and Rasa for NLP.

The developments of the project in the future are aimed at a more careful consideration of the disease. These can make a prediction of the disease by looking at a medical history of a number of patients. Therefore, the team intends to build a web framework to create a rich user interface.

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Farming is a prime occupation in India. In spite of this, the people involved in farming today belong to the lower class and are in deep poverty. The advanced techniques and the automated machines which are taking the world to new heights have been lagging when it comes to Farming. Either the lack of awareness of the advanced facilities or its unavailability leads to the poverty in Farming.

The marketing facility would allow the farmers and customers to view different crops, prices, bills created and related information in their accounts. The main objective of our project is to eliminate the middle agents, thus, reducing the pricing of the crops and inflation. This will help the farmers to get the rightful price for their products and also would be beneficial for the customers. This website will also post various schemes and compensations will be provided to the farmers by the government and will help the farmers to gain maximum profit in the system. The website will also provide an SMS facility which will provide alert messages to both farmers and customers. This facility would suggest help the farmers to take necessary measures to counter the risks through the alert message.

r there is no E-Commerce based farming website available where farmers can directly interact with retailers and whole sellers. Currently, there is no facility available where the farmers can know the crop rates at different markets. It is rightly said that a farmer is the backbone of the country, so there is a need to provide them with all the facilities in order to ease their burden and make them financially strong. Our website is designed as a tool to support the farmers and make them aware of the current scenario of the market. Our website has a multi-lingual feature which is the most attracting element to be found by the users .The website has an algorithm which will automatically generate alerts for the crops available in a particular season. It also provides the facility to generate a user-defined alert, if required.

The primary objective of this project is to assist the farmers with the E-Commerce strategies, thus bridging the gap between the farmers and the sales market so that the farmers can sell their goods face to face to the retailers and earn some fair amount of profit through it. Many farmers might be afraid or may find it difficult to use the website as a medium to sell their goods for which they have given their sweat and soul. Some of them may also think that such type of system is not required as the system would be unknown to them and they might have trust issues, but through various surveys carried out in depth, it has been discovered that as the technology is evolving in different fields, there is also a need of evolving the existing traditional system of selling the crops to bring the farming field back on track.

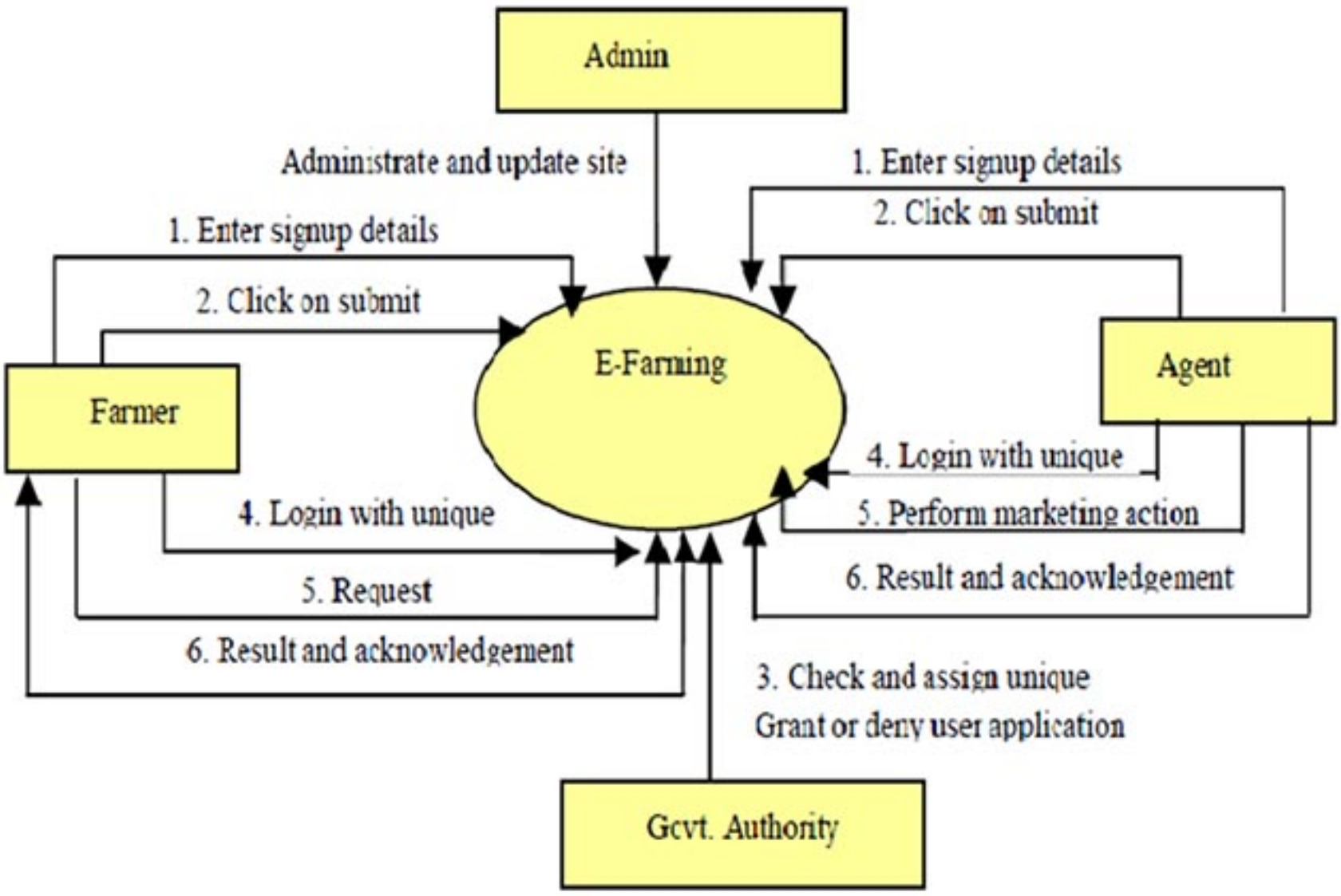


*Figure: Data Flow Diagram*

This E-Farming website will be very helpful to the farmers, it can help provide

- User-friendly interface site for marketing purposes.
- Easy access to descent and up to date market information.
- Reducing the chances of corruption, inflation, inconvenience and difficulties in viewing the market.
- Information of alert messages on cell phones by just sending specified keyword via SMS.
- Easy and free access of website and apply to the schemes and compensation provided by government of India.
- Agriculture education through Internet and or any other E-learning resources.

This website can further be converted into an application (Android, Windows and IOS) for mobile as well as desktop users. Promotion of our website and app through social media may increase traffic on the website appreciably. Artificial Intelligence can be used to provide various solutions for the current system and to answer farmer grievances. The website can also be connected with the latest technologies such as algorithms for detecting user's choice, automatic suggestion for crops based on user's interest, and various profile managing options.

Hence, this project will be helpful for the farmers as it will provide more information about the market, various crops and their price, various alerts regarding the weather conditions and crops. It will also act as a unique interface for the government schemes and compensations. This website will also help the farmers to always be in touch of the new techniques and trends in e-farming. But to some extent, a new user (farmer) will feel a bit hesitant about its use. The overall performance of this website would be faster and convenient than others.


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# GROUP MESSAGING SOLUTION

In every organization, in order to work collaboratively, we need people who can come up together and communicate so that they can express their ideas and share the best thoughts and have a good teamwork experience. In organizations, employees working on same project may be residing in different places of the world. To communicate, they need channels which can hold their confidential messages and also protect them from any kind of networking security threats.

Currently, we have a number of messaging applications like Slack, Gmail, and WhatsApp etc. Prominently, organizations use Gmail for emailing or their own mail sending services for communication. But for mail reception we have a condition that mail receptor should know who has sent him mail. But there can be a condition in which someone might be spoofing, pretending to be someone he/she actually isn't. For organizations which segregate authorities as senior and junior and communicate amongst each other, this kind of a platform could be vulnerable. In current systems, hackers can even attach or inject viruses and other malwares into or via emails. If you want to send messages, you have to manually add the desired recipients.

The project implements an application which would provide a way for communication amongst teams and its senior members without any hesitation and by implementing this project, members will also be able to put forward their views and points easily in front of the whole group and its senior authorities. Also, this project will make communication a lot more effective which will in turn benefit the team in their work. Also, threat agents won't be able to send malicious files as this will be only message based and hence more secure. It will also have a news feed section where latest news about the company will be shown which will keep everyone informed about the current scenarios and everyone will be on the same page.

The project also aims to identify any kind of confidential message sent using this messenger so that the confidentiality remains intact and admin can manage and see which user is using the confidential words also by implementing this, spam and rumor detection can also be implemented.

Communication is the first step in every life cycle. Communication holds the key to any fantastic project because through communication, working teams gather information and requirements of the project. If this step is allotted a required time and is done sincerely, the

project development team will be able to understand exactly what the client wants and then they can start planning for the project and complete it efficiently without facing any client dissatisfaction. For some organizations, messages are very confidential because they may be passing tender messages that should not be leaked.

The main aim of our project is to successfully enable organization plan conversations with people based on roles.

The reader of this paper will be able to understand what the objectives of the project are. He will be able to compare the current system and the project and existing applications. He will get an overview of the project; know the importance of the project, its background and the perspective of the stakeholders and customers.

This project application helps to function efficiently by providing a platform for an organization to communicate amongst each other by eliminating the all distractions created by other platforms like Gmail, Facebook, etc. such as advertisements, other distractions such as friends' email during work and will also prevent from sending malicious files. This project also helps to identify any spam, rumor or confidential message by detecting it in its sending state. This project has a news feed section which will keep the employees informed about the latest trends of the organization.

The proposed system will have all the features we have now thought about such as spam and confidential message detection, no advertisements, affordable, a dedicated news feed section, read aloud messages etc. Hence, this project is meant to construct an application which will ease communication amongst people and also avoids distractions caused due to advertisements and other spam emails with an additional feature to detect confidential or spam or rumor messages in the organization amongst themselves. Also it will have a news feed section which will be operated by the organization itself.

We successfully achieved to eliminate the disadvantages of other messaging systems such as advertisements, distraction because of friends or other spam messages and fake rumors.

We managed to eliminate the subscription system and instead of paying in a repetitive manner, a client can own this with only one time pay and can customize it according to his/her needs which is not provided in other systems.

Thus, by this we conclude that the proposed system (Group Messaging Solution) transparency will be there in a hierarchy, not only in an industry but also other organizations where hierarchy is available. This system helps the group members to have a better communication amongst themselves so that everyone can keep their idea and eliminate the research and communication gap.

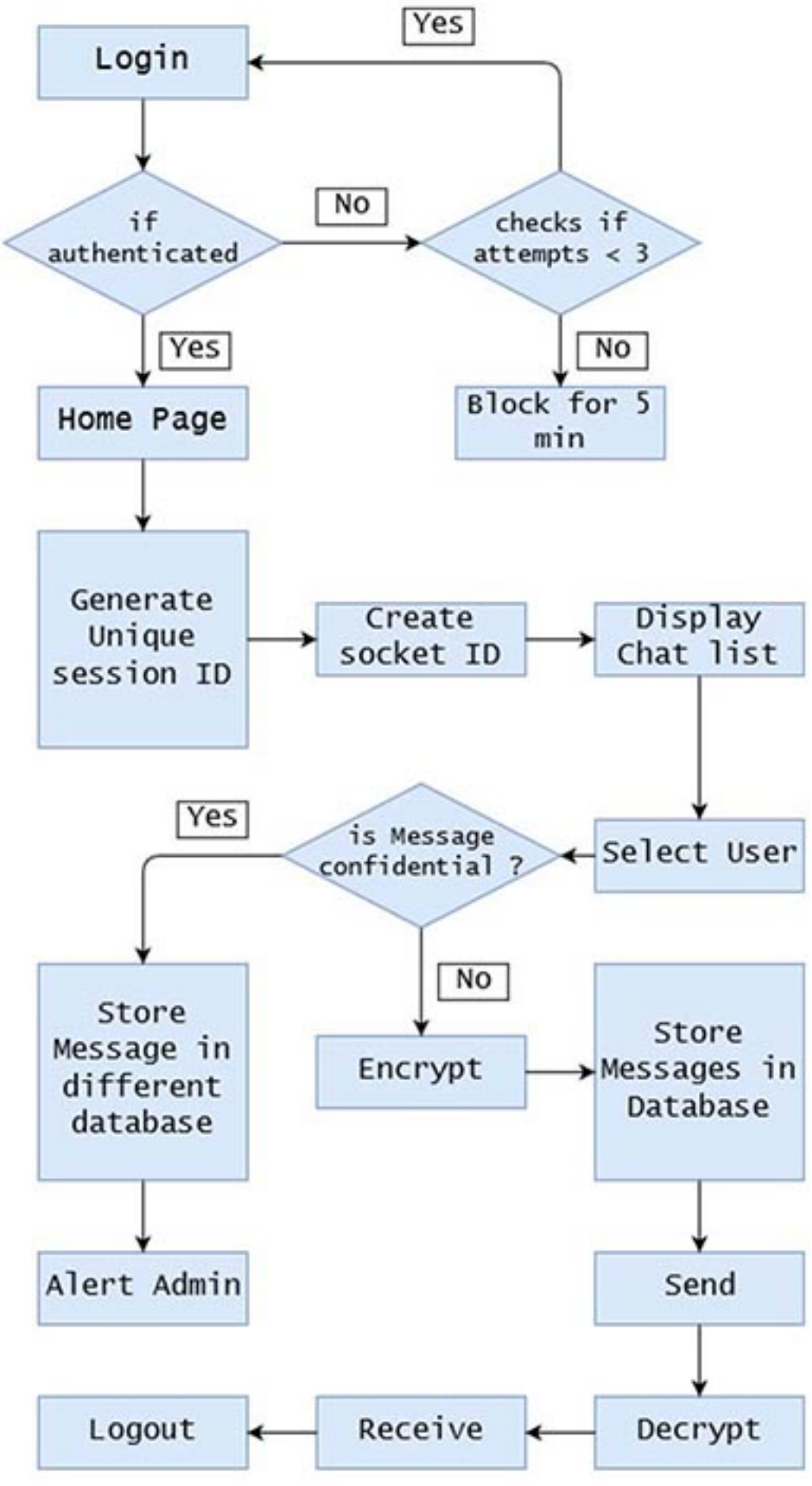


*Figure: Use Case Diagram*

We first went for a literature survey in which we understood several research gaps. There are several systems used for messaging but they have their flaws. We conducted surveys in order to understand the advantages and disadvantages of those applications that the users face. Advantages and disadvantages were analyzed and a feasibility study was carried out to understand what we can do to get a better application.

So we tried and created an application that is customizable completely as per the user's needs. The user can anytime think of changes which suit him/her and change the system. The User Interface helps the user understand about the working of the system. Our work was based on an agile methodology so we completed the work in parts and then collaborated all of it. It removes annoying issues like advertisements. It also has news feed and message detection system which will help the employees stay on the same page and eliminate spamming and preposterous rumors and also admin can keep an eye on maintaining the confidentiality of messages. The application can be used for all lifetime after paying just once.

We successfully matched all expectations with what we created.

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GAs: 1,3,4,6,8,10

# MACHINE READING THE CONTENT OF CUSTOMER FEEDBACK

Managing customer feedback data has become a necessity for firms in order for them to gain competitive advantage in the sector. Analyzing customer complaints' data to find useful information that's hidden is an important step in understanding the customers. It is important to establish communication with the customers through a portal. Feedbacks are basically a way of providing positive or negative thought about a project/software by a person to convey some suggestively meaningful information. Feedbacks are a powerful means of communicating the flaws of a project. The aim of the research is to summarize and extract data from the unstructured customer feedback documents which are about ignoring subscriptions to a telecommunication firm. The title proposes a method for real time customer feedback system that categorizes the content of the feedback and help in deciding about the state of the feedback whether it is positive and negative and submitted to the railways sector for further improvement.

The purpose is to clear the communication gap between a firm and its customer's ideas about their product, and help the normal people in providing a way to express themselves and make the communication process simple and easy. So, the first phase is to collect the data from the user interface and then analyze it. The data present will be in the excel format and will include the feedbacks from the customers which can be good, very good, excellent, bad, etc. Once the data is collected the second phase is to categorize the data into various segments like good, very good and excellent will be in same category and bad will be the other.

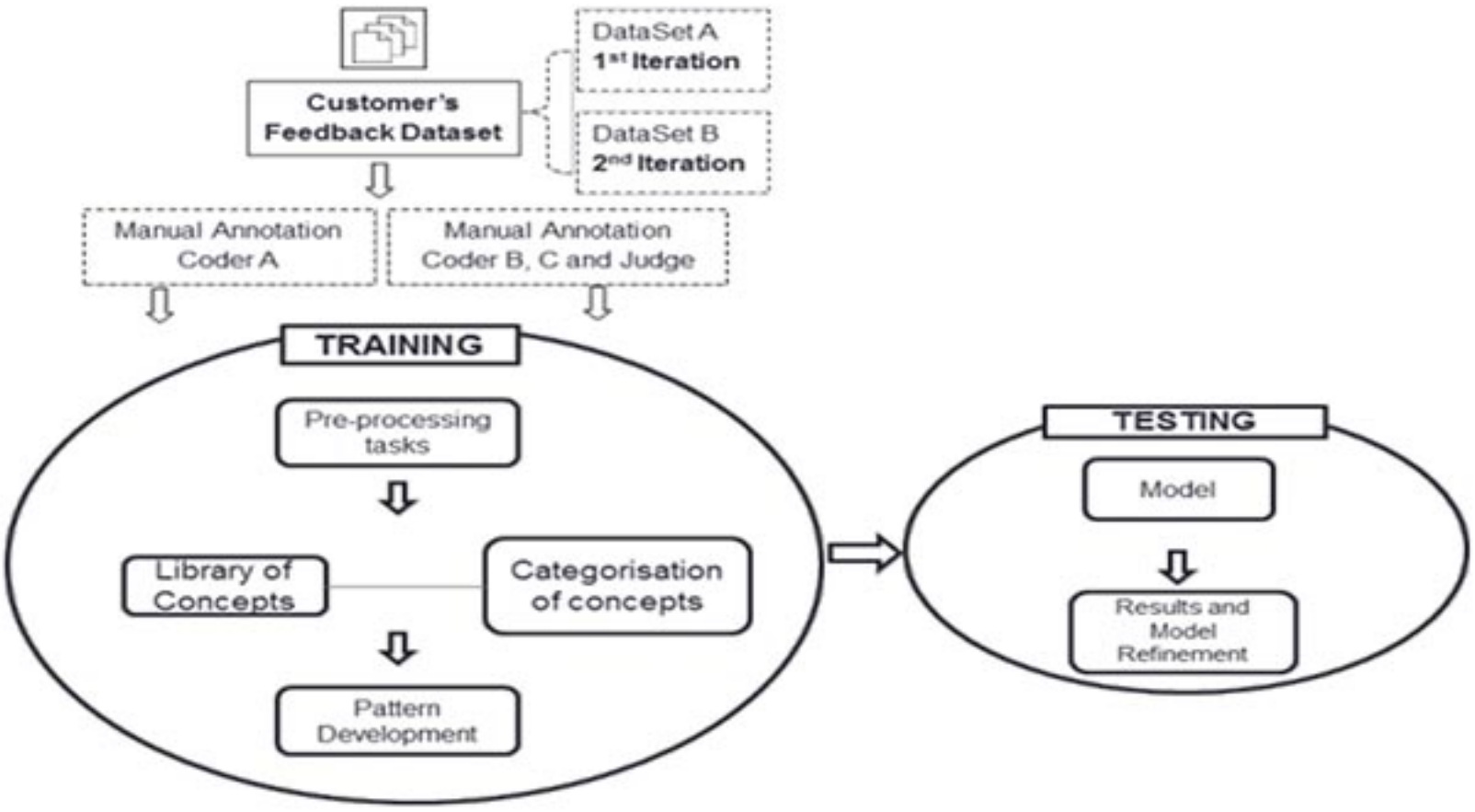


*Figure 1: Architecture*

Analysis is the third phase in software development lifecycle which aims in finding the requirements for the project which we are going to implement. Analysis means to understand the business needs and processes so that the project we implement becomes an efficiently working one. Here the Naïve-Bayes Classifier is used to classify the words into positive or negative and the final feedback will be submitted to the railway firm. After this the firm can make further improvements if any and provide more facilities as suggested by the customers.

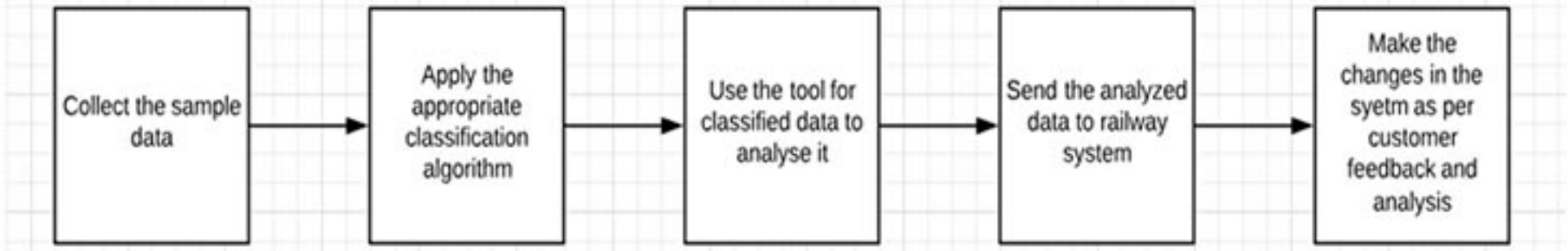


*Figure 2: Block Diagram*

The advantage of this is that the system will provide the real time feedback for the firm to make future improvements. There is a lot of scope in the feedback system as it can be used for various sectors and it makes the handling of a huge cluster of data secure and easy. The sub-categories of the cluster can be more definitive so that will help to clustering and segregate data more precisely. The analysis can help the user understand the fault or error in the system more accurately. Its drawback is that the system will match the comment with those keywords which are in database rest of the words are ignored by the system.


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Each and every living being is a patient at some point in his life. Humans such as businessman, teachers, students, etc from politicians to common man all belong to the category of patients. All these people are so busy in their daily lives that they often forget to take medicines on time. Taking medicine on time can not only cure the disease but also prevent patients from falling sick again. Time is not the only constraint for a patient. The amount of medicine or its dosage is also important for the patient. If by mistake the dosage is excessive, it can prove to be harmful for the patient. Therefore, both time and dosage are important while taking any medicine.

As per a report, the world has seen a large number of deaths due to medication error. It is the need of the hour to focus our attention to take necessary actions to reduce this number. It is rightly said that 'Health is Wealth'. It is very important for each and every individual to take care of his/her health. Our application not only keeps a track of the dosage and time of the medicines but is also very easy to use and convenient for old patients who have inferior knowledge about new technologies. The highlight of our project is that we are using OCR technology. OCR or Optical Character Recognition is a new technology which helps identify the characters or words in a photo provided to the application via a camera and register that word into the database.

An application which keeps a record of the medicine to be taken and the required dosage is necessary. According to the reports of 2007, around 7000 patients succumbed to death due to medication errors. In order to decrease such large counts, a user-friendly medical application is necessary .There are many applications which are available in the market which keep a track of the medicines. WedJat is a similar application which notifies the user about the dosage of medicine and time when the medicine should be taken. Similarly various other applications are available in market with different features to keep a track on the medicine.

It is not always possible for someone to call or remind them to take their medicine. Therefore, there should be some facility present which will remind patients about the time and dosage of medicine to be taken. In the past few years, there has been a sudden rise in the usage of mobile phones.

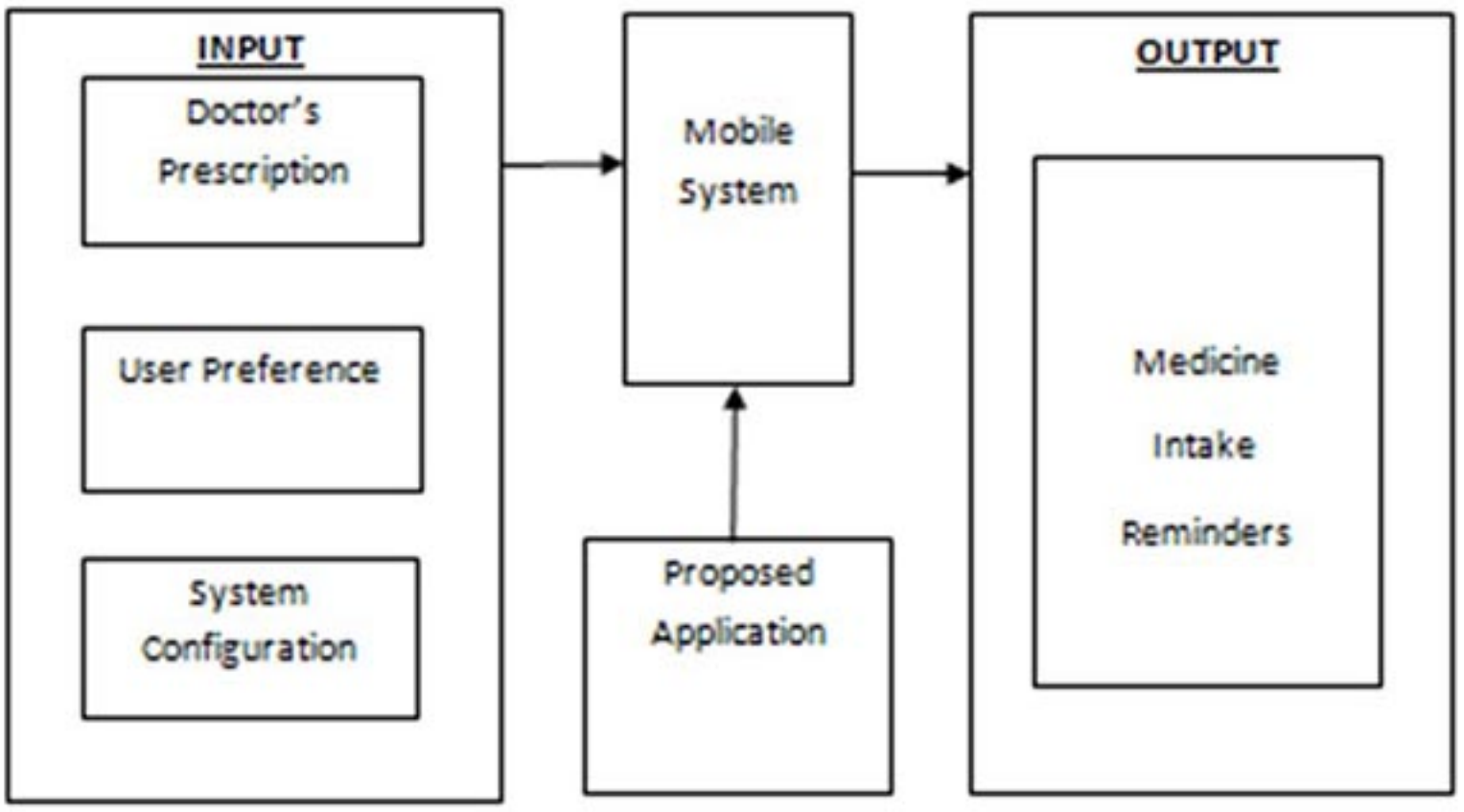


*Figure: Block Diagram*

Our model is based on the OCR technology. It has a lot of scope as OCR technology is used in various fields. It is used in field of documentation for example in medical documentation; in Artificial Intelligence for example in handwriting analysis etc. Our application can be expanded for a hospital management system as well as it can keep the record of individual patients, their medical history, and their treatments to be done on them.

In future, the plan is to direct the focus on improving the accuracy of the application as well as the overall performance so that patients can run the applications smoothly. The plan is to integrate the video calling feature so that communication can become easier. Security of the prescription and the user details is the area which will be mainly focused in future. A search engine feature can also be integrated so that patients can get immediate information about the required medicine on the internet. Along with the provision of internet, the application can also include 24*7 easy and dedicated chatting facilities with the doctors i.e. the patients can chat with the doctors at any moment of time.

The project intends to generate timely reminders to its users to make sure they are on top of their schedule. However the main feature of the project is the OCR module which scans the prescription and automatically creates a schedule with minimal interaction from the user.

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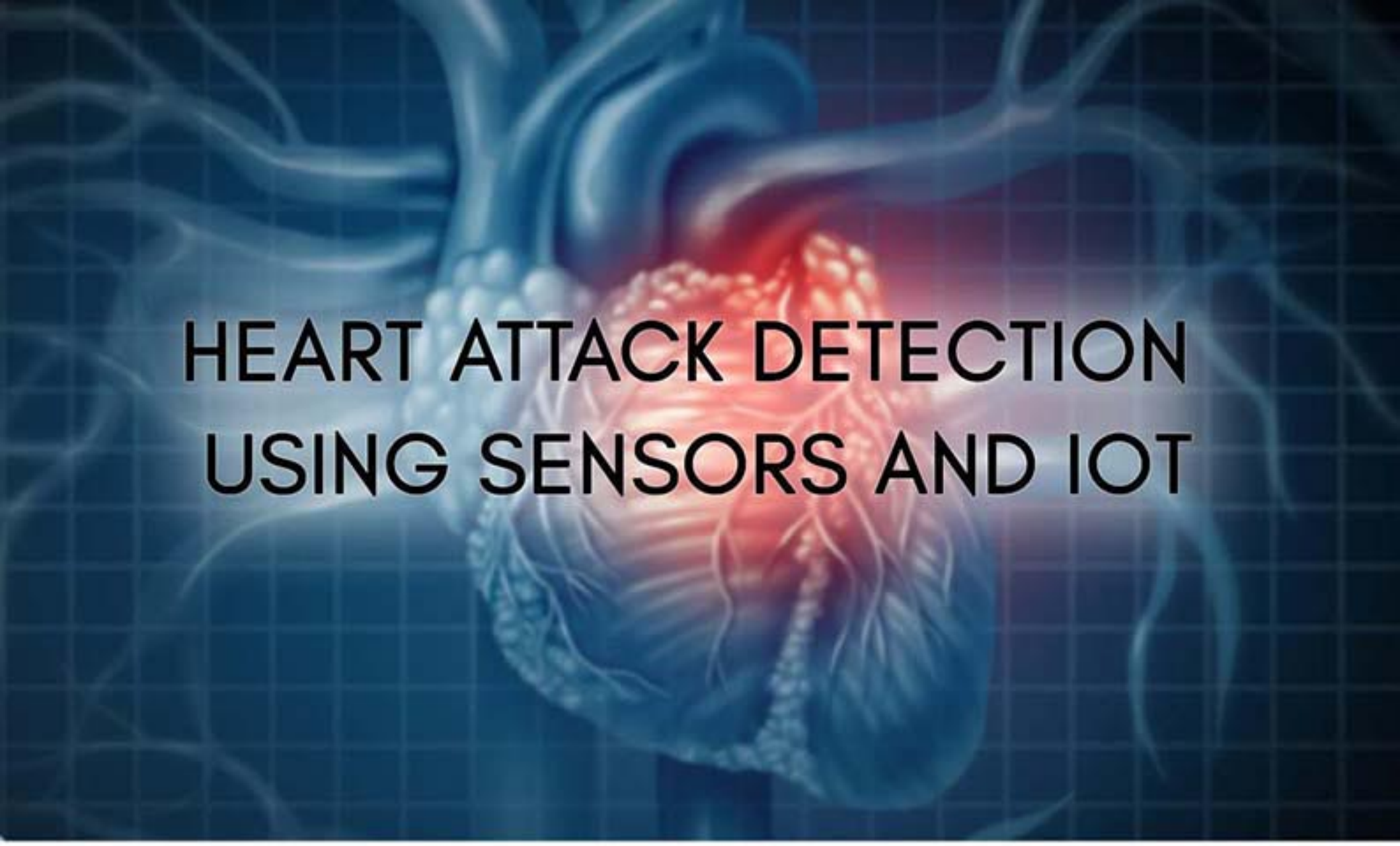
GAs: 1,3,6,7,8,11,12




The proposed system consists of geophones which are used to sense bed vibrations caused by the ballistic force. The geophones help in monitoring a person's heart rate during sleep. This mechanism for heart rate monitoring does not require a special kind of bed. These geophones are placed at the side of the bed, which allows person to sleep in a comfort manner as well as person can move around and change position freely during sleep. Geophones are integrated with Arduino, which connected to the ac amplifier. The vibrations sensed by the geophones is converted from digital signal to analog signal which is to be displayed on to the monitoring screen. Using Geophones only resolve the problem of monitoring heart rate on bed. To overcome this problem, wristband is used. Wristband helps in detection of the heart rate and it is also used for early detection of heart attack using machine learning algorithms. Pulse detection sensor is used to detect pulse rate. Geophones and Wristband techniques will wirelessly send alert to 5 recommended people.

The project aims at creating a system that is able to sense the heart rate using geophone sensor and the pulse band sensor, an intelligent but lightweight healthcare assistant. This application will be able to help healthcare and other users suffering from heart diseases. This also aims at having a basic machine learning capability for heart attack prediction.

In an era where medical diagnosis and treatment has made massive leaps, it is unfair to deny anyone's proper healthcare owing to a lack of means.

One often sees a lack of proper software to help it out in such cases. Software can avoid the necessity of having to revisit doctors, or to spend hours self-researching complex medical terms and appendices, as many diagnosed patients tend to do. The use of a band here can calculate the rate every minute and pass the data to the database.

The proposed system consists of geophones which are used to sense bed vibrations caused by the ballistic force. The geophones help in monitoring person's heart rate during sleep. This mechanism for heart rate monitoring does not require a special kind of bed. These geophones are placed at the side of the bed, which allows person to sleep in a comfort manner as well as person can move around and change position freely during sleep. Geophones are integrated with an Arduino, which is connected to an AC amplifier. The vibrations sensed by the geophones are converted from digital signal to analog signal which is to be displayed on to the monitoring screen.

As Geophones technique only resolve the problem for monitoring heart rate on bed, to overcome this problem pulse-wrist-band is used which is equipped with a BLE Nano Circuit, Pulse Sensor, 3V Battery along with nRF Toolbox application for BLE for demonstrating live activity of heart rate.

Pulse-wrist-band captures the heart beats continuously and sends data to nRF Toolbox application using BLE Nano which can be analyzed using machine learning algorithms to predict early detection of heart attack using abnormal patterns of heart beats. Pulse-wrist-band will also send an alert to 5 recommended people in emergency.

## Design and Implementation

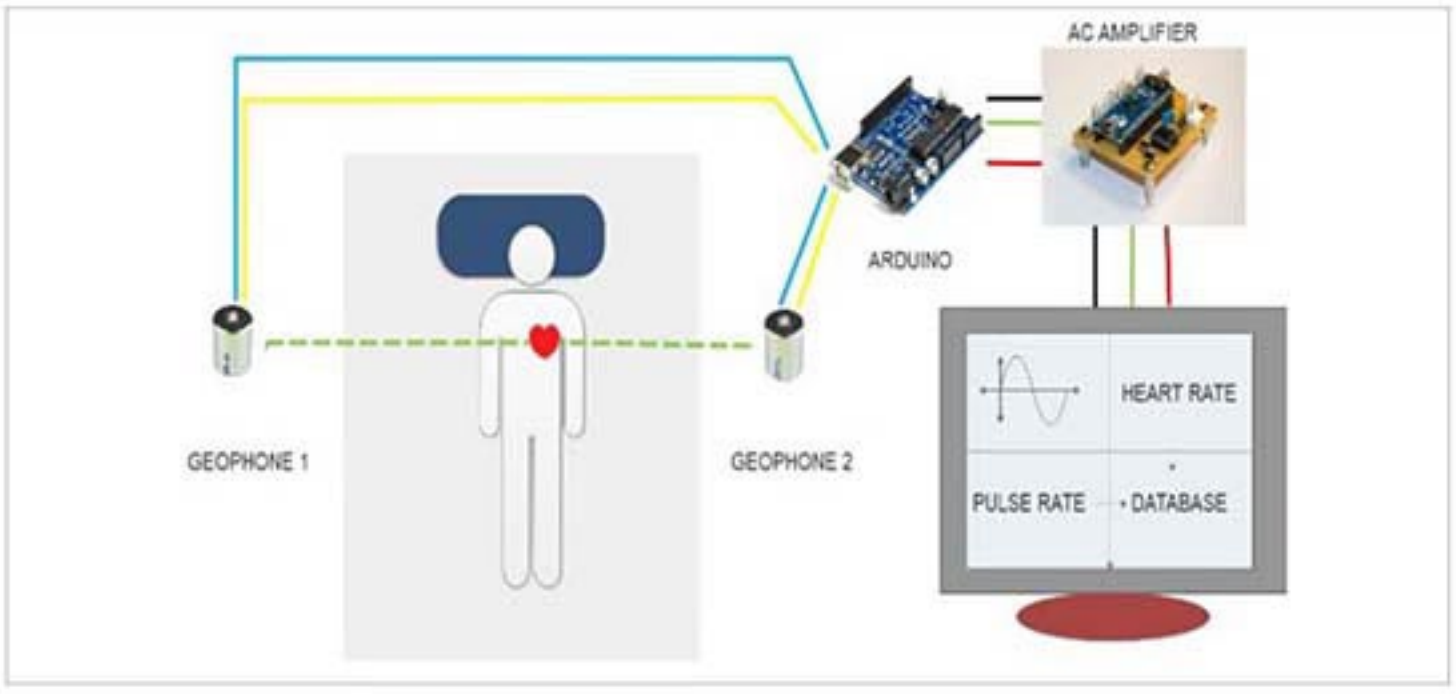



*Figure 1:Geophone Sensor Based Heart Rate Detection and Monitoring.*

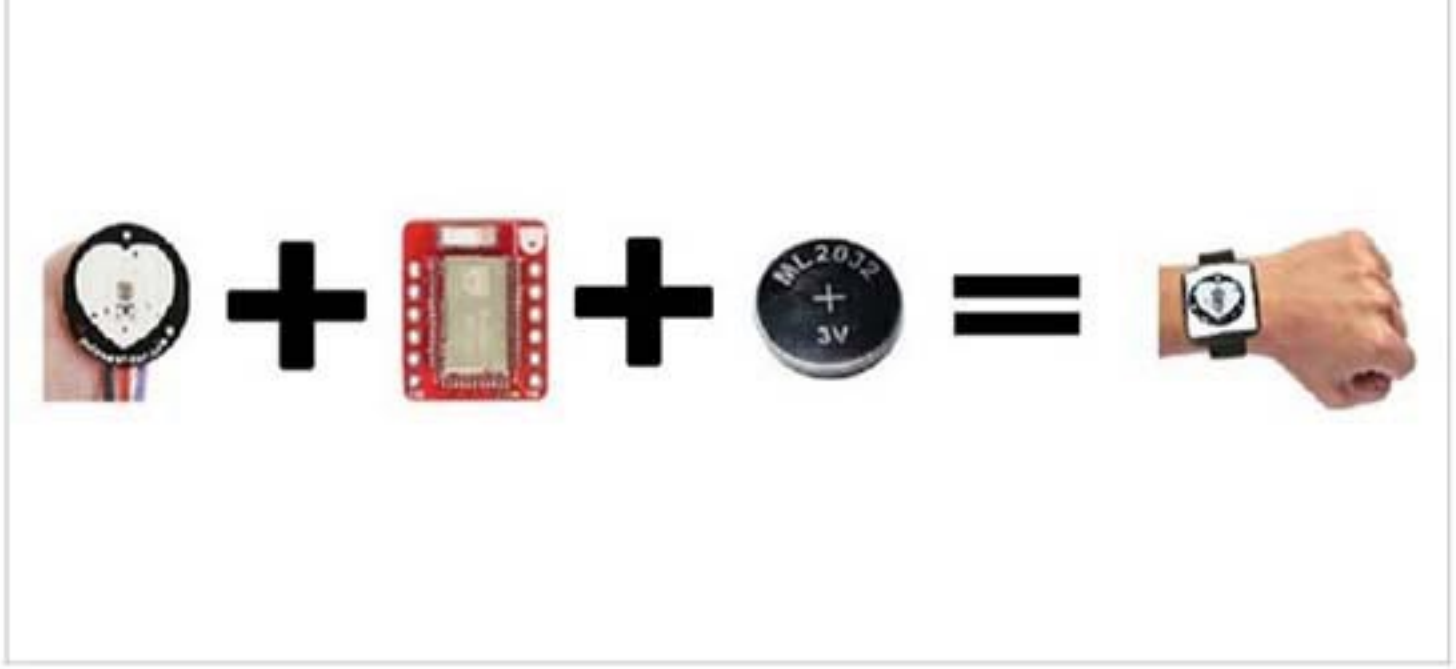



*Figure No 2: Heart Rate Detection and Monitoring using Pulse Sensor Band.*

The project intends to correctly analyze the pulse rate using pulse band sensor and displaying it on the screen. It uses BLE Nano which is for transferring data from the sensor to the device.

Currently the project focuses on gathering a structured authentic data. As medical data and analysis is a sensitive field, the project intends to find an assimilation of the results of various algorithms and compare the accuracy.

It's a challenging task for monitoring and detect heart rate and predict heart attack/ stroke from pulse rate itself. There are other parameters also by which heart attack/ stroke may occur such as patient's diabetic, blood pressure history and all. So, we can consider these parameters also to develop enhanced health monitoring system.

## Flowchart

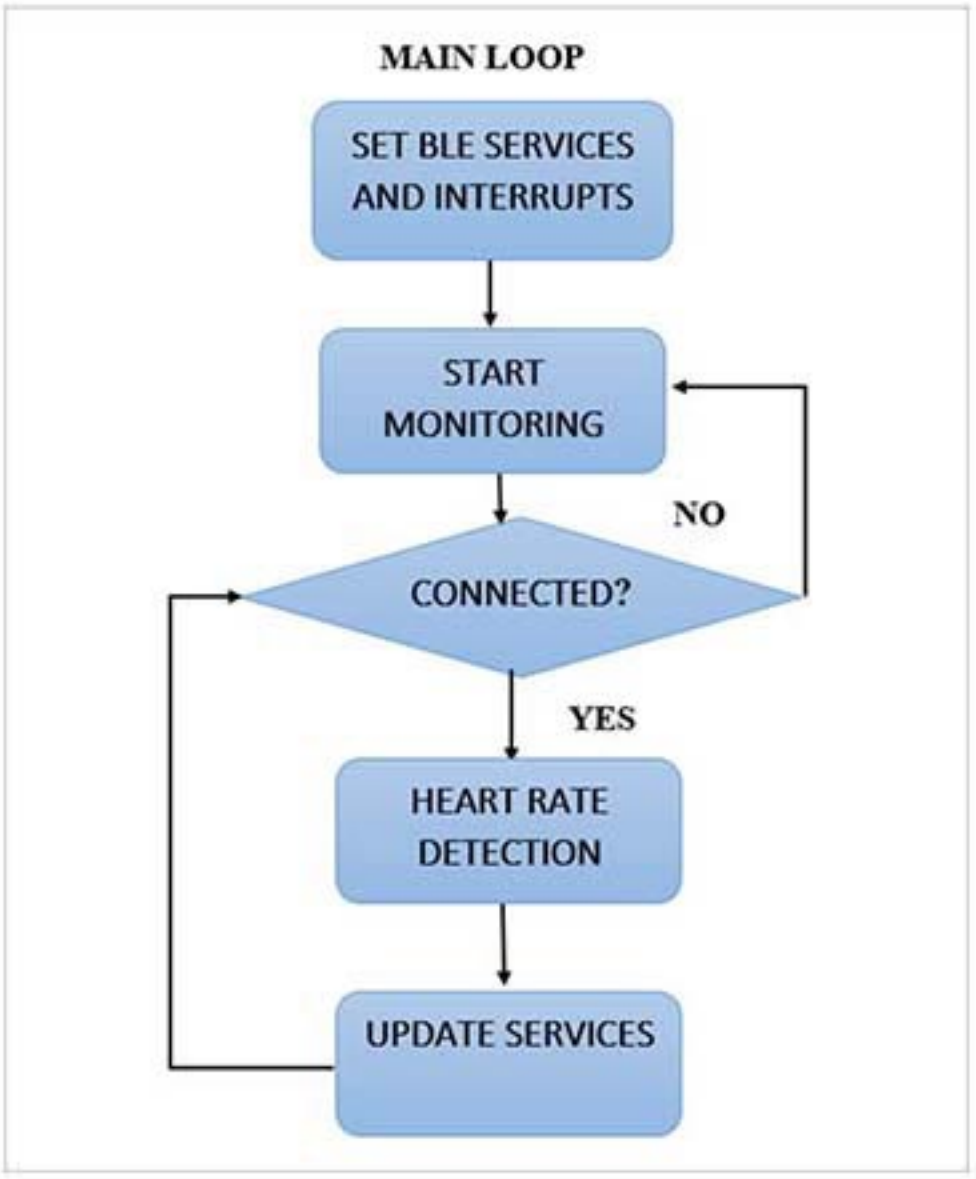



*Figure 3: Flow Chart for Heart rate detection.*

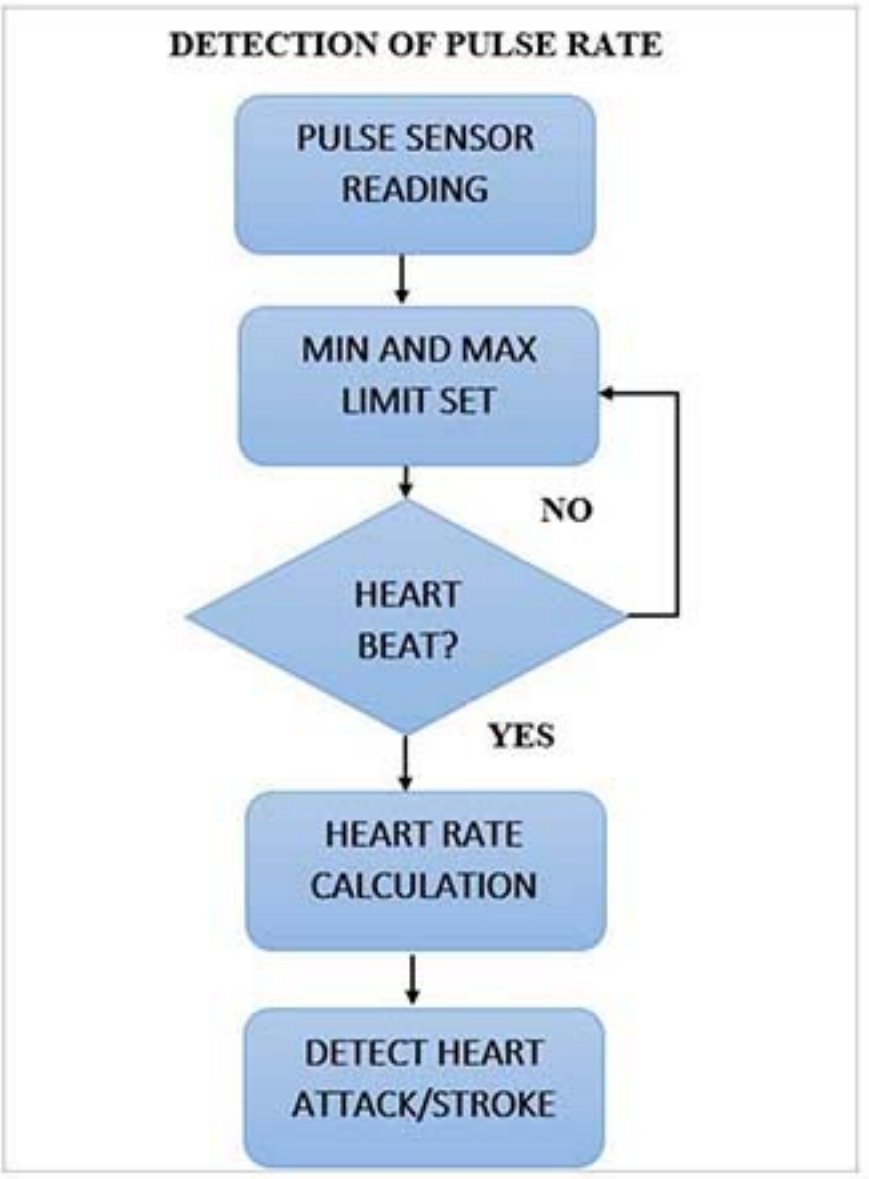



*Figure 4: Detection of pulse rate.*

The project aims at creating a system which is able to sense the heart rate using geophone sensor and the pulse band sensor intelligent but lightweight healthcare assistant. This application will be able to help healthcare and other user suffering from heart diseases.

Our heartbeat separation algorithm relies on the spatial difference between two signal sources with respect to each vibration sensor, and our respiration extraction algorithm deciphers the breathing rate embedded in amplitude fluctuation of the heartbeat signal.

Proposed health monitoring system will monitor the heart beat fluctuation using geophones and monitoring, detection and analysis will be done using pulse-wrist-band which is equipped with BLE Nano Circuit, Pulse Sensor and 3V Battery along with nRF Toolbox application for BLE for demonstrating live activity of heart rate.

Geophones are integrated with Arduino, which connected to the AC amplifier. The vibrations sense by the geophones are converted from digital signal to analog signal which is to be displayed on to the monitoring screen.

Pulse-wrist-band captures the heart beats continuously and sends data to nRF Toolbox application using BLE Nano which can be analyzed using machine learning algorithms to predict early detection of heart attack using abnormal patterns of heart beats. Pulse-wrist-band will send alert to 5 recommended people in emergency.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Purvesh Dave
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GAs: 1,3,4,6,7,8,11,12

# Heart disease prediction using machine learning

Artificial intelligence, though not a new technology, has more potential than most of the newer technologies .It is a cutting-edge technology in every sense. Artificial intelligence has a tremendous number of applications in a variety of areas. Healthcare is one such area, arguably more important than any other.

In an era where medical diagnosis and treatment has made massive leaps, it is unfair to deny anyone proper healthcare owing to a lack of means.

This project aims to make healthcare less exclusive than it currently is and make it easier to search and avail services. This application will be able to help healthcare and other hospital staff work efficiently.

Many virtual assistants are available in the market, and they are highly accurate in handling input, Siri and Google Assistant in particular. Speaking of accuracy, the application understands most commands with enough accuracy to extract genuine results through them.

This application will be able to help healthcare and other hospital staff work efficiently. This project also has a basic machine learning capability for disease prediction, which was built by training a model using tens of thousands of individual records.

The machine learning capabilities were implemented using Tensorflow, an open source deep learning framework designed by Google.

The core functionality of the software, i.e. the heart disease prediction, is done through a popular machine learning algorithm known as Convolutional Neural Network (CNN). CNN's use a feed-forward neural network. Their most popular application is image classification, but it can be used in many other applications, including heart disease prediction.

CNNs make use of a modification of multilayer perceptrons, which require minimal pre-processing. They are also called as Space Invariant Artificial Neural Networks (SIANN), which is based on their architecture of shared-weights and characteristics of translation invariance.

Convolutional Neural Networks are biologically inspired variants of multilayer perceptrons that are designed to emulate the behavior of a visual cortex. These models mitigate the challenges posed by the MLP architecture by exploiting the strong and spatially local correlation present in natural images.

Using CNN's to train the model on a large dataset, our software can predict the probability of a person getting a heart disease to a reasonable degree of accuracy.

## Outputs:

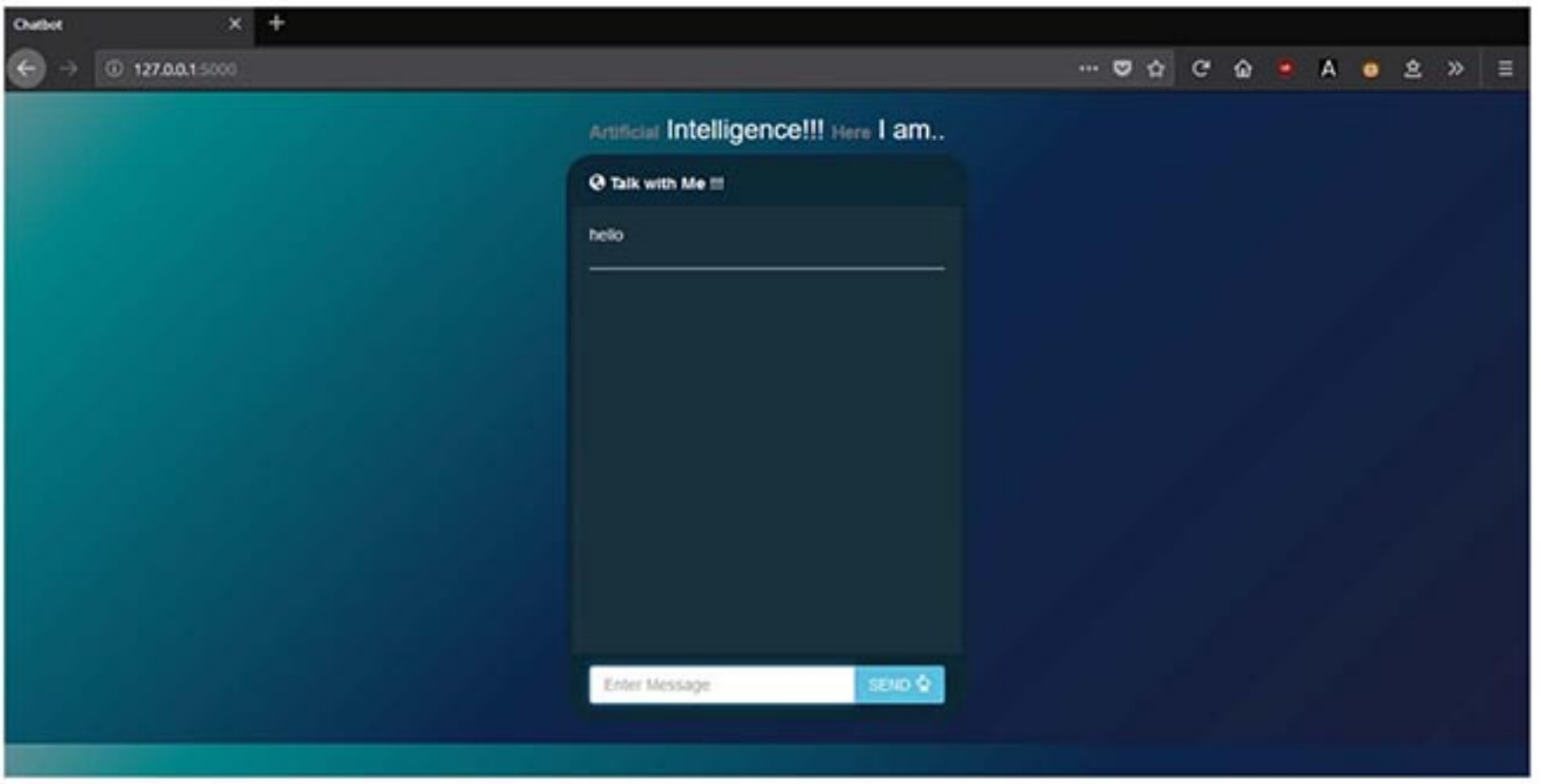


*Figure 1: Web GUI*


*Figure 2: Command line GUI*

Another area that this project can be extended to is wearable technology, such as smart watches and heart-rate monitors. These wearables allow for accurate, real time data to come in from the user's body to the software.

Since wearable technology is on the rise, the medical research community now has more and more data to work with. The algorithm will get even more accurate once hospitals start to classify their data better and add more parameters.

**Varun Mishra**
**BE IT**
**GAs: 1,2,3,4,5,6,7,8,10,11,12**


Deepfake is a technique for human image synthesis based on Artificial Intelligence (AI). It is used to combine and superimpose existing images and videos onto source images or videos. It does this using a Machine Learning technique called a "Generative Adversarial Network" (GAN). The combination of the source and existing videos results in a video that can depict one or more person(s) saying things or performing actions that never occurred in reality. Such fake videos can be created to, for example, depict a person engaging in sexual acts they never were a part of, or used to alter the words or gestures that a politician uses to make it look like that person said something they actually never did.

While the technology isn't exactly new, it does sound like it's working at a higher level than your third-party extensions. The ability to copy, paste, and move around text in single words or blocks is very much a useful feature that could make audio editing easier. However, this appears to be with audio only, so for video editors, it will be most useful when working with voice-over projects. Burying the lead here a little bit, but the standout technological advancement in Project VoCo is the program's ability to create new words and short sentences in the project that analyses and copies the speakers voice. This is HUGE, obviously. It allows video editors the ability to instantly cover mistakes, make changes, make updates, or even create speech that simply never existed before.

The project is still a work-in-progress. At its core, VoCo's main focus intends to be on audio-only projects such as podcasts and audio books. To really get enough data to create new words and sentences, the program needs about 20 minutes of source audio to analyze. However, it does open doors for possible video-editing implications in the future. Having edited interview and VO for hours on end before, the potential to replace painstaking audio scrubbing by simply typing in what you want your subject to say is too good to ignore.

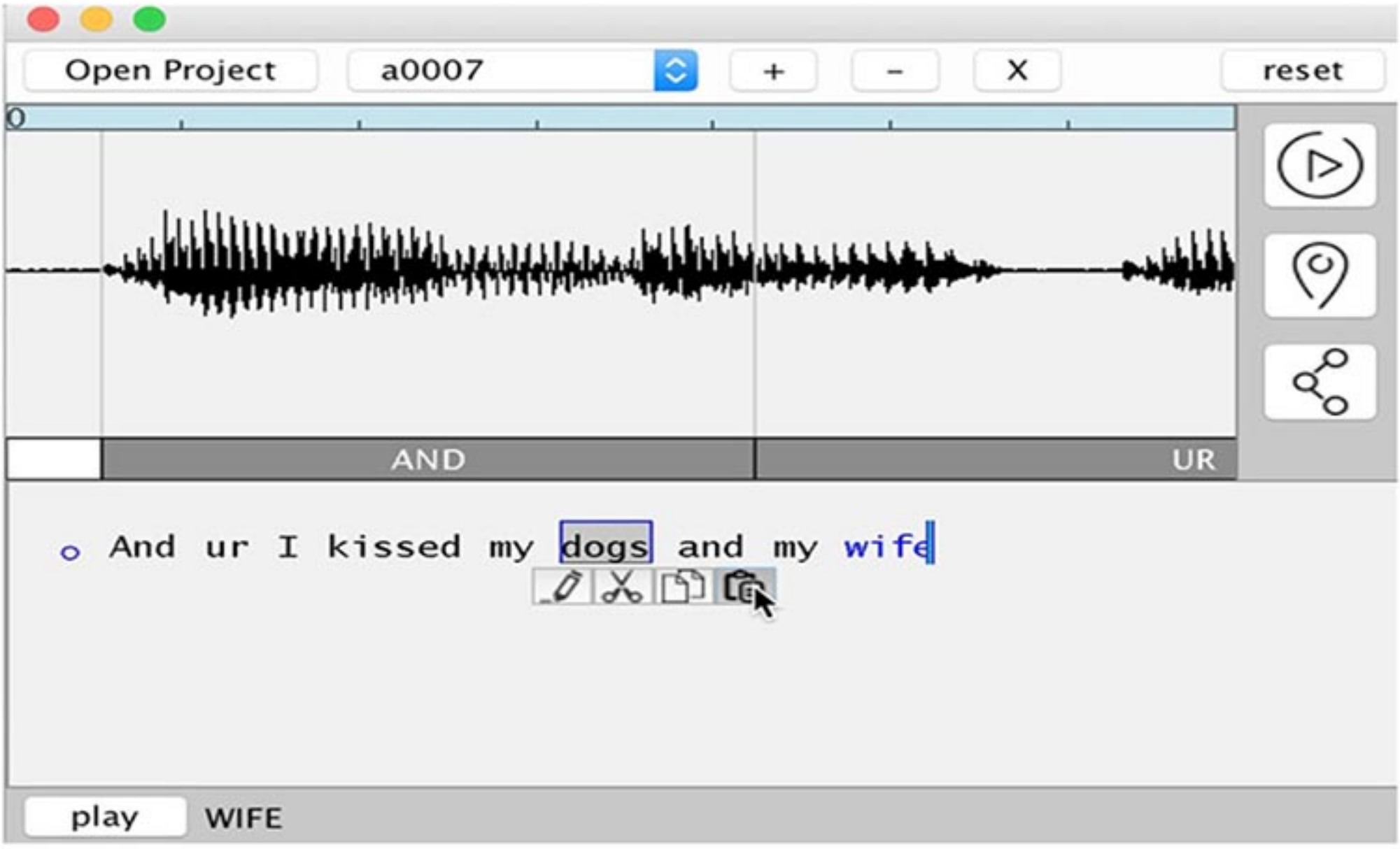


*Figure: New Sentence Text Editing Technology*

## Open AI's AI writer

In 2015, Sam Altman and Elon Musk became skeptical that the world's most powerful AI programs were all being developed behind closed doors — that's why they launched a nonprofit organization called OpenAI with a mission to make safe Artificial Intelligence publicly available.

But OpenAI's program, called GPT2, is so good that it produces writing that's virtually indistinguishable from real journalism, opening the door for increasingly sophisticated fake news.

*"It's very clear that if this technology matures, it could be used for disinformation or propaganda,"*

## Recipe for disaster:

The amalgamation of all the aforementioned technologies can create a disaster. A person with a botnet can create multiple social media ID's. He can teach the AI to write posts that portray his views on the topic or help in spreading propaganda on a mass level. The Deepfake could be used to make false videos and the voice input can be manipulated by software similar to Adobe VoCo to manipulate the victim's voice. These could lead to mass destruction if used with an incorrect mindset and methodology.

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# FACULTY'S EXPOSITION


## Operational Intelligence:
## The Next-Generation of Business Intelligence

Many new elements have been added to Business Operations by data analytics. Organizations nowadays have access to many sources and streams of data, from historic data to current data, industry data, sensor data and much more. All this data is useful in derivation of intelligence, but there are different types of intelligence to glean from your data sets. Two terms which appear similar, but yet, are confusing are 'Business Intelligence' and 'Operational Intelligence'.

## Business Intelligence:

Business intelligence (BI) is a variety of a software application which is used to analyze an organization's raw data. BI includes data mining, online analytical processing and business reporting. Business Intelligence refers to a set of techniques and methods which are used by organizations for making tactical and strategic decisions. It leverages technologies that focus on counts, statistics and business objectives for improving business performance.

Business intelligence helps to combine a wide set of data analysis applications, which includes ad hoc analysis and querying, mobile BI, real-time BI, operational BI, cloud and software as a service BI, enterprise reporting, online analytical processing (OLAP), open source BI, collaborative BI and location intelligence. BI is also used for creating data visualization software to design charts and various information graphics, tools for building BI dashboards and performance scorecards which can display visualized data on business metrics and key performance indicators .

## Operational intelligence

Operational Intelligence (OI) deals with real-time, dynamic, business analytics that provides visibility and insight into data, streaming events and business operations. OI solutions run queries against event data and streaming data feeds to deliver analytic results as operational instructions. With the help of manual or automated actions, OI provides organizations the ability to make decisions and immediately act on these analytic insights.

## Operational intelligence helps organizations to:

- Get a deep knowledge of machine data using all relevant information.
- Reveal important patterns and analytics by correlating events from many sources and reduce the time needed to detect important events
- Leverage live feeds and historical data to understand what is happening, identify anomalies, and make effective decisions
- Deploy a quick solution and deliver the flexibility which will be needed now and in the future.

## Operational versus Business Intelligence:

The recent advancements in computing technology have paved the way for Operational Intelligence to become a reality. While Business Intelligence provides insights for static datasets, it is usually used to identify long-term trends based on historical data. Operational Intelligence on the other hand targets short-lived business opportunities, offering timely, actionable insights. Operational Intelligence is also used to track behavior of live systems, integrating streaming data with customer preferences and historical information for creating a comprehensive view and also for generating an immediate feedback.

Operational intelligence is most often confused with "real-time analytics", which refers to fast, interactive analysis of static data (typically, huge, historical datasets) instead of live data. The analysis of static data helps Business Intelligence to be more interactive as it examines important data patterns and long-term trends. However, it still leaves a critical gap between pattern identification and the use of live intelligence to capture business opportunities at that moment. This gap is filled by Operational Intelligence.

Once the implementation challenges are met, exciting opportunities are created by Operational Intelligence for enhancing the behavior of live systems in diverse industries. Here are a few examples :

- Stock Trading: As they need to monitor huge volumes of data in real time and require a rapid response to events and market trends.
- Cable TV companies: They track data from set-top boxes in real time for analyzing customer activities and the functioning of boxes.
- Online Marketers: They use real-time tools for analyzing internet clickstream data, for targeting better marketing campaigns to consumers.

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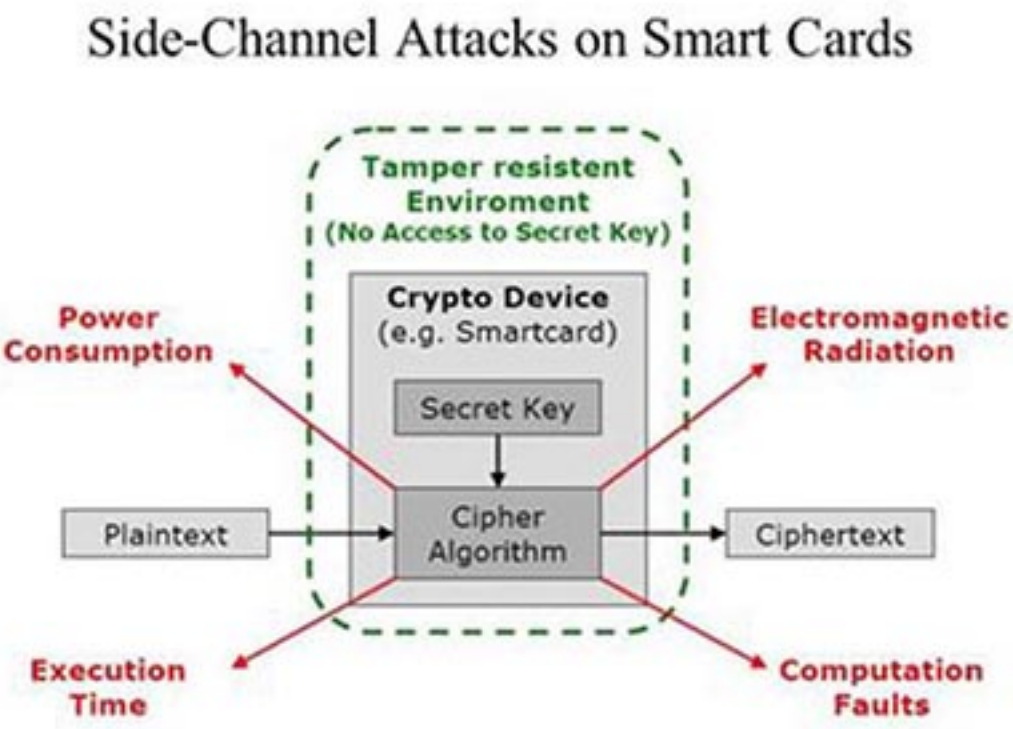
# Importance of time encryption as a countermeasure to side channel attacks

Data security has a major role in the development of communication systems, where more randomization in the secret keys increases the security as well as the complexity of the cryptography algorithms. The side-channel attacks are a class of physical attacks in which an adversary tries to exploit physical information leakages such as timing information, power consumption, or electromagnetic radiation. Since they are non-invasive, passive and can generally be performed using relatively cheap equipment, they pose a serious threat to the security of most cryptographic hardware devices. Such devices range from personal computers to small embedded devices such as smart cards and RFIDs (Radio Frequency Identification Devices). Their proliferation in a continuously larger spectrum of applications has turned the physical security and side-channel issue into a real, practical concern.




In the recent years network security has become an important concern. Cryptography plays a vital role in the information security system against various attacks. Efficient and newer versions of cryptography techniques can help to reduce this security threat. The Advanced Encryption Standard(AES) is a strong symmetric key cryptographic algorithm which uses a number of table look ups to increase its performance. The Cache Timing Attack correlates the timing details for encryption under a known key with an unknown key to infer the unknown key.

It can be noted that a typical side channel attack on time can be avoided by encrypting the actual time data and masking it so that the attacker gets wrong timing information. Running a dummy for-loop or a thread sleep for a random time is enough to mask the timing data.

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# GREEN CHEMISTRY

After the origin of an organism, it took an orderly progress in organic evolution. Although especially after origin of man, there was a rapid progress in invention of different equipment and machinery to fulfil the man's needs and satisfaction. And in the last few centuries, this progress has reached at a very top level. But it also created many problems along the way whose solutions became a great job for the entire world. Amongst these, conservation of the environment is one of the biggest and the most important and challenging problem without whose solution the survival of each and every living organism would not be possible.

The big industrial units in such a large number, synthesis and even utilisation of hazardous chemicals, smoke from vehicles, utilisation of non-biodegradable materials on a large scale, use of radioactive substances, concept of artificial living style etc. have caused an imbalance in our ecosystem because of which are environment is changing, vulnerably.

The temperature of the Earth has risen by 2°C in the last few decades and that is a huge deal of worry. Hence, it has become very important and essential to overcome this situation before it is too late. Therefore, the concept of Green Chemistry was born and was developed to preserve the environment.

Green Chemistry is the utilisation of a set of simple rules the either reduce or eliminates the generation or use or both of hazardous substances in the manufacture and application of chemical products.

The chemical industries should come up with techniques in which there will be no synthesis of use of hazardous chemicals. And not only that, the gases that are produced during the factory processes are not only hazardous to humans but also pollute the environment. So the gases must be made to escape such that the contamination of environment is minimal if not null, such that we have negligibly contaminated air to breathe.

Green Chemistry also promotes use of organic fertilizers instead of chemical fertilizers. Thus, utilisation of organic fertilizers should increase which will help in reducing soil pollution as well as air pollution. Besides this, organic fertilizers also increase the quality of crop and reduce health problems. Synthesis or organic fertilizers does not pollute the air. These fertilizers also solve the hurdle of elimination or disposal of human and animal waste.

Thus, by making use of organic fertilisers, we can procure safer and highly nutritive food.

It is also important that we should always try to live in a natural atmosphere instead of creating an artificial lifestyle. Artificial lifestyle breaks the ecosystem and ultimately our environment is also disturbed.

In order to make our lives more luxurious, we make use of radioactive substances, which may be fatal for living organisms including plants. It also contaminates air and soil. So we should always avoid such radioactive substances or chemicals, especially where metals like Uranium and Radium are used. Their radioactive radiation may lead to mutation which is not good for the world in the longer term.

Hence, in the things mentioned above, Green Chemistry does have a great demand by the whole world and it will help in the welfare of living organisms. To make sure the future generation stays healthy we should seriously consider adapting to Green Chemistry. So let us gather together and walk towards a cleaner and smiling nature and showcase its actual beauty which is timely being degraded and taken away from us.

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GAs:1,2,3,4,7,8,10,11

# ALUMNI'S PIECE

# SHYAM AGRAWAL

Technische Universitat Chemnitz,

Chemnitz, Germany


## API MODELLING AND DESCRIPTION LANGUAGES

One of the most significant, ongoing research areas in the world currently is the modelling process of APIs and their description languages. With a big spectrum of API usage areas and their design approaches, the necessity of taking a closer look on the API landscape became more important. With more complex APIs the need of describing such cases became part of the modelling process as well. The main goal of API modelling is to identify and understand stakeholders and their activities. All the activities are explored in detail in order to understand a better overall picture.

The definition of API as per textbooks as well as on the internet is: "In computer programming, an application programming interface (API) is a set of subroutine definitions, communication protocols, and tools for building software". In simple terms, an API is an interface of a system to which a client can interact with. Web services on the internet expose their data. These data are exposed through APIs called the endpoints. These endpoints are used to interact as well as exchange data with other web services. API acts as a messenger where the user's requests are delivered to the recipient and the response is delivered to the user back. An API helps the user to use the functionality provided by the web service. Consider a restaurant system, the customer has a list of items that can be ordered from the kitchen. Now there is a communication gap between the customer and the kitchen. The waiter comes into the scenario. A waiter acts as a messenger, he takes the order from the customer to kitchen and delivers the dishes from kitchen back to the customer.

Important Factors in API Design : While designing an API the following factors should be considered :

Target audiences are the actual people who will be using the API. The most important part is to understand the purpose of the API. An API user can be anyone new or an experienced developer. A new first-time developer can go through the API documentation and use the API accordingly. An experienced developer can update oneself regarding the API usage. The consumers of the API are categorized into two types: direct and indirect consumers.

Direct consumers benefit from the direct usage of the specified core services. For example, Uber has its own ecosystem. When a user uses an Uber service, it is directly communicating with Uber's servers using Uber's API.

Indirect consumers benefit from add-on services apart from the core services. For example, Uber's ecosystem can integrate services from Yelp. So now as soon as the user ends the journey Uber will suggest the user new restaurants nearby. Uber uses Yelp's API to fetch the desired information. This service of a complete different segment is provided

which makes the consumers an indirect user of the add-on service.

Business Drivers aim to understand the API's purpose. It focuses on to fulfil the business and technological goals. A business goal could be to increase the financial outcome and on the other hand, a technological goal would be to stabilize or improve the stability of the API to be able to handle more requests. To fulfil the business needs, APIs are categorized into 3 types:

Private APIs are quickly set up for internal teams to communicate within the organization with low costs. For example, Jeff Bezos told all teams at Amazon that "all teams will expose their data and functionalities through interfaces and internal communication should be carried out by interfaces only."

Public APIs can be considered as a commercial API. It is majorly developed with a goal of high adoption. This is the final endpoint which the developers will use to interact with the web service.

Partner APIs are a combination of private and public APIs. It also serves the organization's internal as well as external business and technological needs. Amazon is the perfect example of an organization with Partner APIs.

Practices in Good API Design

There are a few common practices that should be implemented for a good API design. To get an API running it firstly needs an understanding of the basic API structure. The goal is to build a powerful tool which should be extendable, easy to use and to read.

Understanding Resources and Collections: "A resource is an object that's important enough to be referenced in itself. A group of resources is called a collection" . There is a unique identifier which identifies these resources and collections. So these data should be addressed in a simple format which should be understandable by anyone who uses it.

Examples

1. /products - This API helps to retrieve all products from the web service.
2. /products/321 - This API helps to retrieve all the information for a specific product.

Versioning: There might be changes in the resources which will require an update in the API. So versioning is introduced in order to track different changes made to the APIs. Versioning can be also used as query parameters to access the data.

Examples

1. /v1/products
2. /v2/products

Pagination: Pagination is important where a large chunk of data is involved. If the data cannot be handled properly it might take down the system. In pagination, "offset" and "limit" attributes are used. "Limit" relates to the size of data and "offset" relates to the position in the chunk where the data should start.

Examples

1. /products?limit=25&offset=50

Here the size of the data should be 25 and the offset position should be 50.

Provide Examples: The best way to design and document an API is to provide

examples of data requests and responses. The developer gets an idea of what type of data responses are expected from the server. Developers also learn what function are available and how to call a method in order to communicate with the web service.

Examples : {“products”: [{“name”: “ABC”, "price": “20”}]}

API Description Languages (DL) : With evolving technologies of the web and the popularity of APIs, when the API wants to be understood and used by other developers, a document for describing those processes is necessary to get an overall overview. In general, API Description Languages (DLs) are specific languages for describing APIs . They are written in a document and tell one which methods and data are used by the described API. There are also other information API description languages provide like endpoints, schemas and message-transfer-types. Second, they serve as a contract between service consumer and producer to make sure everyone is following the right rules. Especially when it comes to using an API as an external developer, they somehow need to understand how to call the methods. The last thing to mention about API description languages is that they are human and machine readable.

The process of building an API is more than exposing valuable data to the external world. It includes multiple steps of decision making and answering questions like: Who is my audience? How many and what kind of resources one wants to provide? How are they accessible? Following certain guidelines doesn't only help one to design an API, it also supports the compatibility with other companies! Speaking of designing an API, description languages are a supportive addition of the process. There are not only handy tools like editors with auto-completion and auto-generated documentations, description languages also serve as a contract between two parties. With this contract, is it guaranteed that the service consumer knows how the API should be handled without getting errors.

# EXPERT TALK

# JIGAR HALANI

Director, Solutions Architect and Engg,
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Every achiever has the start of his journey, please tell us what prompted your interest in computer engineering?

Ok, I think that question goes how a normal middle class person's journey begins, right? I have never seen computers atleast at my age. It's all fascinating stuff and eventually you be like ," Oh, one day I will learn about computers and I would do something about it." I think that second credit goes to these large biggies as well; the worlds of Wipro, TCS, Infosys, HCL who have made this technology so pervasive, made this technology so reachable to people, especially in India that software, hardware is the industry which is the way forward for engineers. They know traditional thinking of engineers and civilians.

So we will move onto the next question. What exactly does the job a solution architect at NVIDIA entail?

Well this is how I describe it. A solution architect is the person in NVIDIA who is the first face in front of the customer, who is representing NVIDIA's product lines technically. We are the people who are held responsible for educating, working, collaborating with the customers to ensure that utilization and understanding of NVIDIA GPUs is the most superior and they're able to harness the power of GPUs to the fullest. That's what a solution architect does. So, we work with sales, we work with marketing, we work with customers on a daily basis, to solve the problem.

What does a typical day at NVIDIA look like, for you?

Well, typical day at NVIDIA looks fairly strategic. We have hundreds and thousands of customers, especially in India and we are geographically so dense so reaching out to every customer is extremely difficult. But at the same time you need to ensure that every person who has a GPU irrespective it is just one or a thousand number of GPUs in their premises, should have access to us in a similar fashion and should be harnessing the power of GPUs effectively. Now to do that you need to have your top priority customers because then, they have the largest amount of GPUs in hand. You also need to conduct programs so that you reach out to the masses at the same time. You also need to have a fabulous collaboration for your future engrossment. So this is what a traditional day looks like where we come, we strategize, we prioritize, we run these programs and ensure we are in front of customers; those who are in definite need with large number of computing infrastructure or already using them or about to buy them.

NVIDIA is in the AI industry, so how has AI, integrated with High Performance Computing(HPC) technology, changed the industry. What industry site major changes?

Okay, so I think traditional computing and high performance computing has been happening for like 40-50 years now. It has been trying to solve the scientific problems on the supercomputers and stuff. Luckily since this technology has taken a pace, there are new methods which have come up to solve these problems much faster. In other words, these technologies are helping you to conclude whether to accelerate your research work that you are doing or not. So if I have to give you more detailed understanding on this, it's like your HPC always give you (and that's where the computing usually happens in FP64) to the last digit of possible decimal accuracy level that you're looking for versus there are trends and methods. You look this problem solving in two fashion: One whether to do these experiments on the supercomputer, because they are costly at times. It's not easy to have these kinds of systems on your premises. So, AI, Machine Learning and Deep Learning is helping you come to those conclusion much faster because you have past data available with you with which you are able to make some analysis out of that and be able to solve it. Second, even if you are running the simulation in a supercomputer to come up with the accurate answer there

are areas which does not need FP64 kind of computing to be done at that level of accuracy. Using ML, using DL there are a lot more things that you can accelerate, you could do it a little differently, there are programming methods. There is a fabulous documentation which was published by Jack Dongarra, the inventor of the TOP500 (top500.org) website and that's where the largest supercomputer in the world are being published every year. Essentially he's the one who came out with the first idea of, putting things together where you do programming in a way that you liberate the lower precision computing infrastructure that is available and ensure that you still achieve the same level of accuracy of your job output that you're looking for but at a much faster pace, thereby saving computing hours, thereby saving man hours and thereby becoming more time to market in terms of your ability.

When we hear the term GPU, one imagines a device dedicated to compute graphics, images, gaming etc. But today NVIDIA has brought GPU technology not only in gaming but also in deep learning, big data, accelerated computing and other technologies. Can you explain this change and how it was brought about?

Sure. So the one who understands graphics and the one who understands GPU well, will echo me that eventually when we started this journey way back in 1993 when we always knew that we are not in the race of latency delivery of the compute, we were always into throughput computing and that's because the graphics needs are much higher in terms of the number of cores that you need to perform your task because you have so many number of pixels in your screen and each pixel needs to get rendered at the same pace as second one only then the screen will look perfectly matching. If you see our architecture, it has always been a parallel architecture. So we always had hundreds and thousands of cores. What people call CPU cores we had GPU cores. But not of fast speed gigahertz. It is always low speed gigahertz but so many number of them, hundreds and thousands of them. Conceptually that was never the concept in CPUs. So first and foremost the processor architecture itself is massively parallel and the second invention which helped us lift this entire ecosystem to the next level was CUDA. It was eleven years back when we realised that if we need to crack a larger market we need to have a programming language like C, C++, FORTRAN and lately then we added PEARL and Python as well on this

on this processor that we have developed and that's where the architecture called CUDA got invented which made us come to the journey of HPC (High Performance Computing). It was in 2012, when somebody saw, there was a competition which was going on for the ML and DL, he realised that having a parallel processor is going to make a huge difference to these kind of codes and I can rewrite this particular stuff in GPUs and can show the world that this could lead into a different processing capacity altogether. The turn took place and in my view NVIDIA leveraged that opportunity extremely well to establish them as a world leader in AI technology.

Given the unique road and traffic conditions in India, do you think autonomous vehicles will ever make it on the Indian roads. Are there any other challenges that self-driving cars may face?

I think this is what the world says and I am not saying this, many people quote this statement- "The day autonomous will crack India, that would be the best accuracy machines will ever achieve." It's not about our roads are bad, it's not about our driving skills are pathetic. It's about the amount of population versus the road size versus the kind of complexity that we live in. Our rural-urban spread out is not that uniform. And it is definitely hard, but yes the day it's going to happen, it's going to change the way we think. Imagine an autonomous car is dropping you at home and then parks itself outside of the city. Your parking problem solved, your roads are free, you don't need to construct house with a parking space, now you could reuse that space for something else. There is less pollution in the city. You know your schedule, well you can schedule your car to come and pick you up the next morning. It will change the whole landscape, the way it gets operated and of course we will save a lot of lives because of not having accidents which are always the benefits what people have been talking about having autonomous driving cars.

Talking about the future, given the rapid pace of advancement in AI do you think we are close to a saturation point or we still have a long way to go?

So I think people have just seen the tip of the ice. My personal view and understanding is that we have a much longer way to go to. There are a lot of advancements that will happen. There's a lot of things that need to be done yet which is just in prototype stage like robotics, autonomous driving we just spoke about, delivery systems,etc. Amazon and flipkart throughout the world, doing delivery through boys, instead of that a robo coming and delivering it for me right now; your security systems or surveillance systems. Look at the number of airports India has, look at the number of railway stations in India, then look at the number of bus stands - are all these systems modernize? Are all these systems using AI to its fullest? The answer is No, right? So we have a long path to go, a long way to implement, learn, improve and then re-implement with the most accurate situations. So we definitely have a long to go.

So, coming up with the last question, what advice would you give to the budding engineerings at TCET who would like to work in this domain.

So I would say two directions: either be the best person in working on the frameworks, if you are using the Deep Learning or Machine Learning. So know more about how to use Tensorflow, Keras, PyTorch and stuff like that and all then of course build upon it to your use cases. If not and if you are a good coder, good programmer, you still believe that you can change the world and the way things operate, make sure you get into algorithm development. These two areas are going to pay you off the highest in the coming future. People will have huge demand for such people in the future. I call it the JAVA trend or the Big Data trend that people have seen in the last decade. 5 years everybody learned JAVA, the next 5 years everybody learned Big Data Analytics. In my view the next 5-8 years everyone will demand Machine Learning and Deep Learning. So the more you go deeper, the better it is, the more you experiment, the better it is. We have many good hardwares which is very cheap, you could make it your Final Year Project like Jetson Nano.
Look for all possibilities that you can explore with. Keep exploring.

# PARENT'S FEATURE

# ALOK CHOUDARY

Senior Business Manager, Rashi Peripherals,
Father of Divyam Choudhary

## DETOXIFYING TECHNOLOGY

Technology has provided comfort to this generation that we could never think of. It has invaded our life so much that there is a drastic change in the lifestyle of the young generation. We have massive knowledge powerhouse through extremely accurate search engines, which can broaden our thinking just by sitting at a place. The world has also gotten a lot closer with the fast, efficient worldwide communication. But it is also having a negative impact. The technology which was supposed to save time and energy is addictive, so much that there are technology-detoxifying centres all around the world.

If we see the current trend, then students learn more from the Internet rather than in classroom. Any question they have, a simple Google search will unlock a wide variety of content to choose from. But a student must needs to understand what is good and what is not good for him. As per current scenario, the education institutions need not teach any theory in the classroom. The students are capable enough to search what is needed. It will be more beneficial for the students, if institutions adapt technology in such a way that other dimensions of being human can be enhanced rather than focussing just on memory and intellect. These dimensions can be explored and improved only by practical approach, where student learn from real life examples and experience what is good for them and society and what is bad. Institutions should derive a technology based holistic development environment for students. A simple example will be a student a accessing YouTube should know his limit and understand when he is wasting time but if he has any questions and needs answers, he should be able to filter out the answers and know which should be the right solution. This cannot be taught in a classroom teaching environment.

Talking about communication, we can communicate faster, more efficiently, and also cheaply but the real emotional attachment is reducing. Just 5-6 years ago during any festival, we used to visit our family and friends. But today we just message them on WhatsApp, Facebook or any other social media. The real human interaction does not happen. You can say that we are overusing the available communication channel for petty comfort.

The next thing we must be aware of is our safety in the online world. Most people are using technology without any safety concerns. There are millions of examples of OTP bank scams, Social media hacks, identity thefts, etc which shows lack of peoples attention towards technology. So we must detoxify from technology a bit so that we can explore the aspects of being human every now and then.

# OUR ACHIEVERS

## SMART INDIA HACKATHON

This year 2 teams from IT department were selected for the Smart India Hackathon - 2019 competition.

One of the team was Team Excelsior@0112358 who were led by Mst. Amey Tendulkar and mentored by Mrs. Shruti Mathur. They represented the collegeat SIRT, Bhopal.

The other team were Team KWISE who were led by Ms. Sanya Gandhimentored by Mr. Namdeo Badhe. They represented the college at IIT Kanpur and also won the first prize for their problem definition.

# OUR TOPPERS

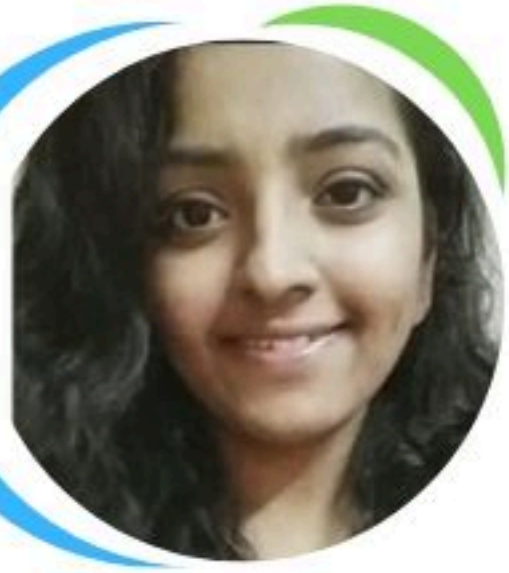
**RIBAH SHAIKH**

**SEM 8 - CGPA 10**

**KINJAL SHAH BE B**

**SEM 8 - CGPA 10**

# OUR TOPPERS



**NEHA RATHOD TE A**

**SEM 6 - CGPA 10**

**BOBBY KALAL TE A**

**SEM 6 - CGPA 10**

**PRIYANK SINGH TE B**

**SEM 6 - CGPA 10**

# OUR TOPPERS

**RUCHA BELGALI TE A**

**SEM 4 - CGPA 9.69**

**RIDDHI THANKI TE B**

**SEM 4 - CGPA 10**

# EZINE-X WORKING COMITTEE

Divyam Choudhary : Editor-in-Chief

Miloni Shah : Student Editor

Shubham Maheshwari : Student Editor

Stuti Shrimal : Student Editor

Mayur Singhal : Designer

Darshan Faldu : Designer

Jigar Vaishnav : Designer

Mr. Aditya Desai : Faculty-in-charge

Mr. Rahul Neve : ACM Branch Co-ordinator

Mr. Sandeep Bankar : ACM Branch Co-ordinator

Dr. Rajesh Bansode : HOD, IT Department

# CODE OF ETHICS

The Department of Information and Technology of TCET believes that Engineers make a direct impact on almost all aspects of Human Life for its betterment.IT Engineers should strictly adhere to the high principles of ethical conduct.In order inculcate high standards in professional behaviour, the department advocates the following code of ethics for all the students,Faculty members, & staff of the department.

**1.**Strive to be professional competent to provide high quality product & services.

**2.**To responsibly make decisions, minimizing hazards to society and to disclose potential factors that maybe a threat to health and society.

**3**.Be fair to all individuals and not discriminate between individual based on religion, race, sex, age, disability, national origin, etc.

**4.**Give credits to contribution of others viz. copyrights, patent, intellectual property., etc.

**5.**Protect and respect privacy and ensure confidentiality of information whenever appropriate.

**6.**The Knowledge gained during the course of study will not be misused for carrying out any illegal activities, intruding and hacking of networks.