Vivekanand Education Society's
Institute Of Technology

Department Of Computer Engineering

PRAKALP 2021–22
A Project Book

PRAKALP '22

CONTENTS

SUMMARY

Sr. No.	Area Of Specialization	B.E.	T.E.	S.E.
1.	AI, Deep Learning & DWM	13	11	4
2.	Big Data Analytics & Machine Learning	09	16	10
3.	IoT & Robotics	04	02	-
4.	Image Processing	04	06	4
5.	Networking & Security	02	04	-
6.	Cloud Computing	04	03	1
7.	Application Design & Product Development	20	11	33
	Total Projects	56	53	53

PRAKALP '22

SUMMARY

Sr. No.	Title/Year	No. Of Projects
1.	Industry / Collaboration Projects	10
2.	Microsoft AI For Earth Grant Projects	3
3.	Avishkar Projects	2
4.	CIIA Projects	6
5.	Pradarshan'22	22

I. B.E. PROJECTS

1. AI, Deep Learning & DWM

1.1.	Nirbhay Naari - Tech to Combat Domestic Violence and Harassment at Workplace	
1.2.	Detection and Analysis of Parkinson's Disease using AI	
1.3.	Privacy - Preserving AI : Demystifying Annomization for GDPR Compliance	
1.4.	Detection Of Lung Carcinoma using Artificial Intelligence	
1.5.	Classification of Depression on Social Media Using Text Mining	
1.6.	Emotional AI Enabled Interview Aid	
1.7.	Automatic text summarization for e-commerce product descriptions.	
1.8.	DubML.AI (Dub My Language)	
1.9.	Gujarati Script Recognition	
1.10.	आsha- An Early Intervention for children at risk of Autism Spectrum Conditions	
1.11.	Business Meeting Summarization	
1.12.	Summarizing Online Meetings	
1.13.	दिशा निर्देश - AI solution for deaf and mute.	

- 🔴 Winconsin: International Project
- 🔵 TIFR Collaboration Project
- 🔴 Cerelabs Collaboration Project
- 🟡 Avishkar Projects
- 🟠 Industry Project
- ⚪ CIIA Projects
- 🟢 Microsoft AI For Earth

I. B.E. PROJECTS

2. Big Data Analytics & Machine Learning

2.1.	Automated Emotion Recognition From Facial Expressions Using Machine Learning Algorithms	
2.2.	UpAIsthiti:A Touchless Attendance System	
2.3.	Detection of ADR from vaccine safety data	
2.4.	Emotion Mapping based Music Recommendation System using Machine Learning	
2.5.	Business Intelligence for Insurance Sector	
2.6.	Ocean Waste Detection Model	
2.7.	Predict and Diagnose Malnutrition among children in India	
2.8.	AttenQ-Attention Span Detection Tool For Online Learning	
2.9.	SehatCo - Smart Food Recommendation System	

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I. B.E. PROJECTS

3. Internet of Things & Robotics

3.1.	Angle of Steering Rotation in a Self-Driving Car	
3.2.	MIME: Movement in Modern Electronics	
3.3.	Unremitting Survelliance: A Patient Monitoring System	
3.4.	Predicting the effect on Energy Sector and Greenhouse Gas (GHG) Emissions dependency due to electrification of the Indian Automobile Sector using Machine Learning.	

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🟠 Industry Project
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I. B.E. PROJECTS

4. Image Processing

4.1.	**Form Scanner & Decoder: Extraction of Text from an image of any Application Form and its Language Translation Using OCR**	
4.2.	**INSTA HEARING- Speech to Sign Using Animations**	
4.3.	**Prime Era- One Place for Leraning Fundamentals of Indian regional Languages and Indian Sign Language**	
4.4.	**Sainnya Sahyogi: an image captioning System for military**	

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I. B.E. PROJECTS

5. Networking & Security

5.1.	Querencia- An Encrypted Biometric authenticated ATM System	
5.2.	e-Voting System Using Blockchain	

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I. B.E. PROJECTS

6. Cloud Computing

6.1.	Automated Visual Inspection of Silicon detectors in CMS experiment	
6.2.	CCE: Crowd Counting and Estimation	
6.3.	Creating a Machine Learning Model to Predict Success of a CrowdFunding Campaign	
6.4.	Quality Assurance of Silicon detectors in CMS experiment and Particle shower classification using Deep Learning	

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I. B.E. PROJECTS

7. Application Design & Product Development

7.1.	**MyDietDiary - Diet Recommendation System**	
7.2.	**Automated Product Tagging for Apparel**	
7.3.	**Krushi Vikas - Multiservice app for Indian farmers**	
7.4.	**Aatmanirbhar Sanchar: Self-Sufficient Comms**	
7.5.	**Vayu - A mobile friendly pollution control to meet sustainable development goals.**	
7.6.	**AgriCare**	
7.7.	**Telemedicine Data Management System**	
7.8.	**Management Information System for Rural Micro Finance Groups**	
7.9.	**e-Krishi: A one stop portal for farmers**	
7.10.	**FarmEasy - One stop solution for all farming need.**	

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I. B.E. PROJECTS

7. Application Design & Product Development

7.11.	Titli-Making Life Easier For Women	
7.12.	AutoMark - Convert Mock-Up Sketch to Mark-Up Code	
7.13.	Smart Antivirus System	
7.14.	Eye Explorer	
7.15.	Samvaad - An app to talk to hearing impaired	
7.16.	Money Heaven - The Complete Financial Analyzer	
7.17.	NutrifyMe - your personal nutritionist	
7.18.	The road to Swasth Phasal: E-farming portal	
7.19.	Samaan - Everyone has a chance of a better life.	
7.20	Automated MCQ generation using Deep Learning	

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II. T.E. PROJECTS

1. AI, Deep Learning & DWM

1.1.	AI-based Virtual Interpreter for the Hearing Impaired	
1.2.	Climate, Air Pollution and Forest fires: AI based models for Indian case study.	
1.3.	Prediction of Crop prices as a Commodity in the Market	
1.4.	Towards attaining SDG with AI: assessment of riverine plastics	
1.5.	Road Condition Detection	
1.6.	AI based statistical analysis of land-use plastic pollution in India	
1.7.	Patient Treatment Recommendations Model	
1.8.	Safe Distance Monitoring	
1.9.	AI based Aura Imaging	
1.10.	Precesion Agriculture using Generative Adversarial Network	
1.11.	Resume Screening Usaing KNN Algorithm	

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II. T.E. PROJECTS

2. Big Data Analytics & Machine Learning

2.1.	Kisan Mitra	
2.2.	Optimum proximal fuel station indicator	
2.3.	Detecting the Covid-19 healthcare requirements based on social media posts	
2.4.	DermaGenics - Early detection and recommendation for treatment of melanoma	
2.5.	Legal Document Analysis	
2.6.	Visual NLP	
2.7.	VesBot: One Stop Solution	
2.8.	Shopping Assistant for Elderly.	
2.9.	Detection of Breast Cancer using Machine Learning Algorithms	
2.10	Water Quality Index Analysis and Prediction	
2.11.	Sign Language Detection System	

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II. T.E. PROJECTS

2. Big Data Analytics & Machine Learning

2.12.	ShoppersTime: Shopping made easy	
2.13.	A System to detect Brain Anamoly	
2.14.	Loan Prediction System	
2.15.	Disease Prediction using chatbot	
2.16.	Click-Through Rate Prediction Using ML	

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II. T.E. PROJECTS

3. Internet of Things & Robotics

3.1.	Customer Churn Prediction (CCP)	
3.2.	Range Prediction Of Electric Vehicles And Locating Charging Stations Along The Route	

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- ● Industry Project
- ● CIIA Projects
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II. T.E. PROJECTS

4. Image Processing

4.1.	**Paddy: To detect and prevent paddy crop disease**	
4.2.	**Sign Language Recognition System**	
4.3.	**Identifying Foliar diseases in Tomato Plants**	
4.4.	**Skin Lesion Detector using Dermoscopic Images**	
4.5	**Image Outpainting**	
4.6	**Detection of Covid-19 using Chest X-Rays**	

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II. T.E. PROJECTS

5. Networking & Security

5.1.	Healthify (Telemedicine Services)	
5.2.	Votechain: A Decentralized Voting System	
5.3	DOT HAZMAT (Detection Of Threat: Hazardous Materials)	
5.4	Bitcoin Prediction using Machine Learning	

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II. T.E. PROJECTS

6. Cloud Computing

6.1.	E-kart (E-commerce website)	
6.2.	**Forecasting of Carbon Emission due to Meat Industry**	
6.3.	Secured Repository of Health Reports	

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II. T.E. PROJECTS

7. Application Design & Product Development

7.1.	Amigo: My virtual friend	
7.2.	Smart Colony System	
7.3.	Curriculum Based System	
7.4.	Konark Dossiers	
7.5.	BOOK IT Find pre-owned books	
7.6.	Recipe-Find new recipes according to your diet!	
7.7.	Fast N' Fresh	
7.8.	StockDotinfo	
7.9.	Learning Management System	
7.10.	Online Doctor Appointment Booking System	
7.11	Shiksha: A career guide	

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III. S.E. PROJECTS

1. AI, Deep Learning & DWM

1.1.	Goal 8	Wealthy Kids India	
1.2.	Goal 3	Health Awareness App for Diabetic Patient in Rural India	
1.3.	Goal 4	e-Guidance portal	
1.4.	Goal 4	A gaming guide for Autistic and Deaf Kids	

III. S.E. PROJECTS

2. Big Data Analytics & Machine Learning

2.1.	Goal 3	**Personal Smart Nutritionist**	
2.2.	Goal 3	**CVS Anaylzer**	
2.3.	Goal 3	**COVID'19 Data Analysis**	
2.4.	Goal 4	**Read to Right**	
2.5.	Goal 4	**Question Generator from Text Document**	
2.6.	Goal 8	**Placement Prediction using Machine Learning**	
2.7.	Goal 9	**Automatic Timetable Generator**	
2.8.	Goal 9	**Music Recommender System**	
2.9.	Goal 9	**Website creation and Social Media Research**	
2.10.	Goal 9	**Book Analysis and Recommendation System**	

III. S.E. PROJECTS

3. Product Design and Development

3.1.	Goal 3	App for the elderly	
3.2.	Goal 3	Healthy Kids Repository	
3.3.	Goal 3	Activity planner and Reminder	
3.4.	Goal 3	Website for giving guidance about pet grooming	
3.5	Goal 3	Web Portal	
3.6	Goal 3	Online Medicine Booking Store	.
3.7	Goal 3	Covid Patient Tracker	
3.8	Goal 3	Snap Care Health Assistant	
3.9	Goal 4	WEATHERCAST+ (Weather Updates & Forecast Application)	
3.10	Goal 4	Reader's Hub	

III. S.E. PROJECTS

3. Product Design and Development

3.11.	Goal 4	e-Sports Ecosystem	
3.12.	Goal 4	Visualization of polynomial Arithmetic	
3.13.	Goal 4	Chess Engine with AI	
3.14.	Goal 4	Web-based application for automatic timetable generation	
3.15	Goal 4	Visualization of sorting algorithm	
3.16	Goal 4	A Quiz Application	
3.17	Goal 4	Educational Tool and Progress Calculator for kids	
3.18	Goal 4	Android - Memory Game Development for Kindergarden	
3.19	Goal 4	Contact Book Application	
3.20	Goal 4	Typing Tour	

III. S.E. PROJECTS

3. Product Design and Development

3.21.	Goal 8	Restaurant management system	
3.22.	Goal 8	Blood donation management system	
3.23.	Goal 8	Online Shopping Store App	
3.24.	Goal 9	Online Toy Management System	
3.25	Goal 9	Coupons Generation System	
3.26	Goal 9	Handwritten Text recognition using python	
3.27	Goal 11	Railway reservation system	
3.28	Goal 11	Housing Society Management System	
3.29	Goal 11	Mobile app for Cab Sharing	
3.30	Goal 11	Restaurant Management	

III. S.E. PROJECTS

3. Product Design and Development

3.31.	Goal 11	WorkFlow-an app for employee management	
3.32.	Goal 15	Crop Management System	
3.33.	Goal 16	Crime Reporting and Management System	

III. S.E. PROJECTS

4. Image Processing

4.1.	Goal 8	Website for document organization	
4.2.	Goal 4	**Path-o-Mind: Online exams' cheating Detector System**	
4.3.	Goal 9	License plate Recognition	
4.4.	Goal 9	**Car License Plate Recognition using OpenCV and Raspberry Pi**	
4.5.	Goal 11	**Image Classification from Dataset**	

III. S.E. PROJECTS

5. Cloud Computing

5.1.	Goal 9	Next Generation Web Application Development	

B.E. Projects

I	**B.E. Projects**
1.	**Deep Learning and Data Warehousing & Mining**
1.1	**Nirbhay Naari - Tech to Combat Domestic Violence and Harassment at Workplace**

Group Members: Sakshee Sachin Sawant, Divya Hiralal Raisinghani, Srishti Vazirani, Khushi Zawar

Mentor: Dr. Mrs. Nupur Giri

Abstract: Social and economic costs of abuse of any kind are tremendous, with repercussions across society. It may come in the form of teasing, rape, and murder, and can take place at home, on the streets, at work, and on public transportation. Depression, STDs, PTSD, eating disorders, isolation, unemployment, wage loss, and lack of involvement in routine tasks are some of the many issues women face, including the inability to care for themselves, their children, and their families. Our initiative is dedicated to curbing violence against women by providing a platform for women to speak about violence as well as detect hand gestures through which women can ask for assistance at any time. As part of our solution, we provide four modules: Violence/Crime Scene Detection against women, audio-video conversion and harassment detection, help hand signal detection, and multi-label story classification. Our approach uses Convolutional Neural Networks (CNN), Long Short-Term Memory (LSTM) for video classification along with Support Vector Machine (SVM), Randomforest for audio classification. Furthermore, if an emergency occurs, the victim will be able to share her location with police stations nearby.

1.2	**Detection and Analysis of Parkinson's Disease using AI**

Group Members: Omkar Mane, Advait Naik, Aditya Gurnani, Krish Amesur

Mentor: Dr. Mrs. Nupur Giri

Abstract: Parkinson's disease (PD) is a central nervous system neurodegenerative condition that causes temporary or permanent loss of motor movements, speech, and mental processes. Parkinson's disease (PD) is characterized by a wide spectrum of movement and non-movement symptoms that can affect function to varying degrees. Unfortunately, PD is difficult to diagnose because there are no conventional diagnostic tests or systems that can be relied upon for accurate results. While the Unified Parkinson's Disease Rating Scale (UPDRS) is recommended as a first-line for monitoring Parkinson's disease progression, it must be administered by a neurologist, therefore it's not a good tool for evaluating short-term variations in the disease state. For this reason, neurologists need to use automated diagnostic technologies to aid them. The study focuses on the development of a system for estimating the prevalence of a person's Parkinson's disease (PD) symptoms by remotely monitoring numerical

interpretations of their regular motor movements as movement disorders escalate. The research has also focused on the identification of the vocal impairments in Parkinson's disease patients' flowing speech or vowel rhythm. Parkinson's patients with a more severe form of the condition sketch spirals at a slower pace and with less pressure. Hence, the proposed method uses Composite Feature Score (CFS) of Motor Movements (M), Sketching (S) \& Pen Pressure (P) and Vocal Impairments (V) features to evaluate the severity of Parkinson's disease (PD) with a need to find parameters that have a greater link so that they can be taken into account for an appropriate diagnosis. Diverse multi-feature processing techniques have been utilized in the study to extract and compute valuable features to develop accurate scores for evaluating PD decision-support systems.

1.3	**Privacy - Preserving AI : Demystifying Annomization for GDPR Compliance**

Group Members: Rohan Ghosalkar, Jay Dulera, Arnav Bagchi, Khushi Makhijani

Mentor: Dr. Mrs. Nupur Giri

Abstract: Privacy preserving Artificial Intelligence is an approach to keep sensitive data used to create and train Machine Learning models secure and less vulnerable to attacks . Usually, a well-performing Machine Learning model relies on a large volume of training data and high-powered computational resources. Such a need for and the use of huge volumes of data raise serious privacy concerns because of the potential risks of leakage of highly privacy-sensitive information; further, the evolving regulatory environments that increasingly restrict access to and use of privacy-sensitive data add significant challenges to fully benefiting from the power of ML for data-driven applications. A trained ML model may also be vulnerable to adversarial attacks such as membership, attribute, or property inference attacks and model inversion attacks. Our project researches the feasibility of such methods and compares their viability with existing traditional approaches to Machine Learning.

1.4	**Detection Of Lung Carcinoma using Artificial Intelligence**

Group Members: Shreyas Udupa, Shreeja Nanda, Manoj Ayyappan, Riteshsingh Kadakoti

Mentor: Dr. Mrs. Gresha Bhatia

Abstract: A major cause of cancer-related deaths is lung cancer because of its aggressive nature and late detection at advanced stages. Detecting lung cancer on time is crucial to the patient's life and a significant challenge. Most often, chest radiographs (X-rays) and computed Tomography (CT) are used to diagnose malignant nodules, but the presence of benign nodules results in inaccurate diagnoses. In the early stages, benign and malignant nodules seem strikingly similar. The research presented here presents a unique deep learning-based model for the diagnostic accuracy of malignant nodules using multiple approaches. Herein, we discussed the Volumetric Convolution (V-Net) architecture for detecting and classifying lung nodules

using the Lung Nodule Analysis (LUNA-16) dataset.
1.5 **Classification of Depression on Social Media Using Text Mining**
Group Members: Ayush Wadhwa, Pawan Lulla, Laveen Dawani, Pratik Chainani
Mentor: Dr. Mrs. Gresha Bhatia

Abstract: Accurate depression diagnosis is a very complex long-term research problem.The current conversation oriented depression diagnosis between a medical doctor and a person is not accurate due to the limited number of known symptoms.To discover more depression symptoms, our project focuses on extracting entities related to depression from social media such as social networks. There are two major advantages of applying text mining tools to new depression symptoms extraction.The use of Social Network Sites (SNS) is increasing nowadays especially by the younger generations. The availability of SNS allows users to express their interests, feelings and share daily routines. Many researchers prove that using user-generated content (UGC) in a correct way may help determine people's mental health levels.

Firstly, people share their feelings and knowledge on social media. Secondly,social media produces a big volume of data that can be used for research purposes and social media posts provide a rich source of data and information that can be used to train an efficient model. Mining the UGC could help to predict mental health levels and depression. Depression is a serious medical illness, which interferes most with the ability to work, study, eat, sleep and have fun. However, from the user profile in SNS, we can collect all the information that relates to a person's mood, and negativism. In this research, our aim is to investigate how SNS user's posts can help classify users according to mental health Levels. In our research, we collect data from social media initially, pre-process and analyze the data, finally extract depression symptoms.

1.6 **Emotional AI Enabled Interview Aid**
Group Members: Tejas Dhopavkar, Omkar Ghagare, Onkar Bhatlawande
Mentor: Dr. Mrs. Sujata Khedkar

Abstract: Emotions help in providing additional meaning to the text written or words spoken by a person. They play an important role in several sectors such as maintaining a good relationship with customers by analyzing their feedback, analyzing the candidate's speech and text to know their emotions and interest in the company, and so on. In this project, we focus on extracting the emotions of interview candidates and analyzing their text and speech so that a company can find a better fit for the company as well as the candidate can know what meaning or emotion his/her speech or text conveys. Audio and text datasets are used which are pre-processed and fed to the Machine Learning models which help in classifying the emotion

and analyze them to provide analysis of the input given. Using this application companies and candidates can get a good overview and brief analysis of the speech/text.

1.7	**Automatic text summarization for e-commerce product descriptions.**

Group Members: Bhavika Mulwani, Sameer Israni, Praveen Mirchandani

Mentor: Dr. Mr. Dashrath Mane

Abstract: Text Summarization implies extracting texts and paragraphs into a smaller report , decreasing the content of the original text and at the same time keeping prime information and giving a vague description on what the article is. Text reading is a long and strenuous task, text summarization is becoming popular and thus the inclination for research. In this project, we will perform the project of Natural Language Processing to summarize text with Machine Learning algorithms .In our day to day life,there are various purposes for text summarization in different domains such as news synthesis , reviews of products on e-commerce websites , legal text synthesis, medical reports which can be accomplished with text summarization. The objective to summarize a text is to construct a factual and fluid summary containing only the important points expressed in the document.

1.8	**DubML.AI (Dub My Language)**

Group Members: Abhijit Pradeep Thikekar, Riya Menon, Saurav Sunil Telge, Gauravi Anil Tolamatti

Mentor: Mrs. Priya R.L.

Abstract: Based on a survey in 2020, out of the total number of people using the internet, the percentage of users who watch video content on any device is on average 85-90%. Out of this, regional languages make up to 55% of television consumption and 30% of streaming video consumption, highlighting the fact that these regional language videos are confined to an area and cannot be viewed and understood by a significant number of global audiences. Also, live video conferencing has seen a boom in recent times, leading to the need for live translation features which would allow any person to attend any live event. The proposed solution aims at dubbing a video file. It includes giving a video and an audio source file as an input to the system, of which the audio source file will be translated into the targeted language. In order to retain the voice tones and annotations of the original audio, voice style transfer will also be implemented which combined with translation will produce the final audio file. The video source file will then be passed through a Generative Adversarial Networks (GANs) which will transform the facial expressions of characters to achieve lip sync in accordance with the output audio file generated previously. This would convert the video from one language to another while still providing a seamless experience in viewing the content. It will facilitate people with methods to overcome various language barriers. The generated video and audio files will be

compiled to make a single file and together produce the final output of the proposed system.

1.9	**Gujarati Script Recognition**

Group Members: Abhinav Sharma, Dhiren Soneji, Aabha Ranade, Dhwani Serai

Mentor: Mrs. Priya R.L.+Co-guide(Lifna C.S.)

Abstract: Character recognition is the extraction of printed or handwritten text from images into machine-readable format. The extracted text can be easily edited, modified and efficiently stored. While there are several OCR and HCR systems available for the English language, such systems are not well developed for Indian languages such as Gujarati. This work deals with text recognition of the Gujarati Script. The input to the system will be an image having Gujarati printed or handwritten text and the system will produce an editable text document having the contents of the recognized text in the image. This novel project will be a step toward the cultural and linguistic preservation of the Gujarati language.

1.10	**आsha- An Early Intervention for children at risk of Autism Spectrum Conditions**

Group Members: Tanvi Shetty, Maitraiyi Dandekar, Anmol Devnani, Puneet Meghrajani

Mentor: Mrs. Vidya zope

Abstract: Autism Spectrum Disorder (ASD) is a developmental disorder that impairs a child's cognition and communication. Early intervention treatments have proven to be helpful in the child's development but as no specific medical test exists it proves challenging to do so. Our system aims to bridge this gap. Our proposed system performs a dual-factor screening-questionnaire and image-based screening, giving a tentative prognosis to help the child and family seek the special care and treatment it needs. We have implemented the questionnaire screening test using the Random Forest Classifier and obtained an accuracy of 99.6% and for the image-based screening Keras Sequential Model was used which gave an accuracy of 91.25%. This system also assists the child to better understand social cues with its emotion recognition module. The educational development module of our proposed system helps evolve the cognitive skills which are impaired in a child with ASD. Over the course of time, a child can learn and reinforce its skills by playing games, the built-in games in the system, while we keep track of the progress the child has made. We intend our proposed system to be the first step towards overcoming the hesitancy related to ASD and providing the tools to help overcome the impairments that one faces with an autism Spectrum Disorder.

1.11	**Business Meeting Summarization**

Group Members: Rahul Koli,i Jayant Mukundam, Muskaan Sharma, Harshita Mishra

Mentor: Mrs. Rupali hande

Abstract: The importance of meeting summaries comes into picture when there is a need to convey the points discussed in the meeting in an incisive manner. It is normally time consuming for a person to write the complete discussion and then understand the whole document. Thus, these summaries play a significant role in saving time and presenting the meeting ongoing in a format in which only the important points are noted down with their context. Automatic Text Summarization(ATS) is a major step in this field. It is an AI-driven procedure that reduces the text with the help of the most predominant information such that the meaning of the text is not changed. This very feature of ATS can be used in summarizing the points discussed in any online meeting. The research paper is mainly focused on the complete procedure of generating these summaries from a meeting transcript. Additionally, important deadlines, or the action point generation is also discussed.

1.12	**Summarizing Online Meetings**

Group Members: Omkar Mangalpalli, Amit Joshi, Saurabh Lalwani, Yash Laddha

Mentor: Mrs. Abha Tiwari

Abstract: With advancements in technology, formal meetings have taken the online audio-visual format. Also, in current times, most of the official organizational meetings are carried out online. There are various meeting platforms like Google Meet, Microsoft Teams, Zoom Meetings etc. which provide advanced facilities like sharing presentations, creating polls, recording the sessions and many more. Moreover, latest versions also provide extraction of text transcripts from meetings. Though, the task of summarizing online meetings is to be done manually. There's no option for making a summary of meets so that it can be referred to in future. Using modern technologies like machine learning, there's the possibility of summarizing text extracts. This concept can be used to create a summary of online meetings. Automatic Meeting Summarization is a functionality which can be really helpful

1.13	दिशा निर्देश - **AI solution for deaf and mute.**

Group Members: Deepika Gambani, Karan Kalani, Simran Watwani, Mohit Balani

Mentor: Mrs. Rohini Temkar

Abstract: There is a huge gap in communication between deaf & mute people and the abled-person. It becomes really difficult to understand the language and viewpoints of deaf & mute people.To bridge the gap between communication, we have built a robust application दिशा निर्देश - AI solution for deaf and mute which provides a solution to this problem. Existing system uses algorithms which have lower accuracy compared to our model. Our system captures the 3D image of a hand gesture using a media-pipe library which detects the hand and marks 21 points at different locations of the hand. These point locations create a

gesture and it gets processed through our algorithm. The algorithm provides the output on the screen. To make it more user friendly we have also added text-to-speech conversion in multiple languages where users get the output in regional language

2.	**Big Data Analytics & Machine Learning**
2.1	**Automated Emotion Recognition From Facial Expressions Using Machine Learning Algorithms**

Group Members: Shikhar Niranjan, Rohit Vadhya, Nikhil Sewani, Vinayak Baranwal

Mentor: Mr. Sanjay Mirchandani

Abstract: Facial Emotion Recognition (FER) is the technology that analyzes facial expressions from both static images and videos in order to get the information on one's emotional state. The system is used for capturing images which are compared with the trained dataset available in the database and then the emotional state of the image will be displayed. The purpose of the project is to make a study on recent works on automatic facial emotion recognition via Machine Learning algorithms.For facial expression classification, the training is done through HaarCascade Classifier with a latent emotional state that takes care of the miss-/false detection.The focus of the study is on computer automated perception of human emotion. The method is independent of gender and facial skin color for emotion recognition. The system consists of three phases: face detection using HaarCascade, normalization and emotion recognition using a dataset with seven types of expression (neutral, joy, sadness, surprise, anger, fear, disgust).

2.2	**UpAIsthiti:A Touchless Attendance System**

Group Members: Salonee Velonde, Dimple Nachnani, Mayur Pawar, Sejal Kriplani

Mentor: Dr. Mrs. Gresha Bhatia,co-guide:Mrs.Abha Tewari

Abstract: Managing attendance is a vital task for every institution. Considering the Covid pandemic where many organizations have resorted to online mode of working, it has become imperative to maintain social distancing and digitize various processes. Thus for maintaining attendance of the students of schools/colleges or employees of a company, a touchless attendance system is required that records the attendance by capturing faces and does not waste time. The touchless attendance system, UpAIsthiti provides a means for conducting the attendance activity completely online and without any contact. This one-of-a-kind application uses a client-server model and captures the faces of students/employees through video feeds from mobile phone cameras and the images are sent to a server, where image processing is used to process the faces. Further, with the help of dlib and the face recognition library, it identifies the faces and records the attendance in the software itself. The processed image is again sent back to the client android application and the user gets notified about their

attendance. Additional functionalities for data analysis and manipulation have also been added to the system. The admin can access the records of a particular day and the profile of the user. They can also view the live analysis report of the organization. The super admins can add, update and delete a user/admin when required. Thus, the whole attendance system is an effort to make the attendance activity easy and efficient.

2.3	**Detection of ADR from vaccine safety data**

Group Members: Sahil Lotya, Nikhil Gangaramani, Akansha Ahuja, Shivani Kulkarni

Mentor: Dr. Mrs. Sujata Khedkar

Abstract: Due to the pandemic vaccines were developed at a rapid pace and to ensure proper post-market pharmacovigilance the proposed model will help vaccine manufacturers to classify the Adverse Drug Reactions (ADRs) based on the severity and will help them to take necessary and timely action. The proposed model will input the patient data, The data will be preprocessed and cleaned before further analysis. Based on the symptoms text it will classify the ADR as a minor, major, or deadly reaction.

2.4	**Emotion Mapping based Music Recommendation System using Machine Learning**

Group Members: Ayush Raj Singh, Aakash Chauhan, Nikita Samtrai, Tina Rajpal

Mentor: Mrs. Sunita Suralkar

Abstract: Emotion Mapping based Music Recommendation System is to provide users with suggestions that match their emotions and to assist them accordingly. The image is first captured and then converted to an emoji, and future analysis is done through the emoji's face. Analyzing a user's emotional facial expressions can help them understand the subject's current emotional or mental state. Music is an area that is likely to change a person's mood. It is well known that people use facial expressions to express what they want to say and the meaning of words more clearly. By developing an emotion mapping system, users can determine their mental state, and if they are unwell, they can change their mood by listening to pop-up messages containing songs. User's facial features are captured with the help of a webcam. By combining the user's photographs and emotion, the appropriate analysis is done, and the songs are displayed.

2.5	**Business Intelligence for Insurance Sector**

Group Members: Kushal Dayani, Sumit Tripath, Bhavesh Lalwani

Mentor: Mr. Prashant Kanade, Co guide: Mrs. Prerna Solanke

Abstract: Growth is the fundamental motive of any kind of business. However, there are very few companies that successfully actualize the vision and take decisions based on the historical dataset. These decisions have been taken based on efficient predictive analysis on past records. Not only historical data but current data also makes predictive analysis. Various statistical and data modeling approaches need to be used in predictive analysis to get an informative decision and results from collected data. Business intelligence is a new technology of an integrated solution for insurers with the business requirement being the key factor that drives technology innovation. This research paper studies the concept of business intelligence and tries to know the impact of it on the Indian insurance industry by considering the benefits of the same. Efficient usage of business intelligence empowers predictive analytics to make more accurate decisions for business betterment.

2.6	**Ocean Waste Detection Model**

Group Members: Siddharth Sunil Tayde, Aditya Atmaram Sawant, Barun Singh, Nikhil Rajesh Masand

Mentor: Mrs. Sujata Khandaskar

Abstract: The amount of marine debris is excellent in understanding the diagnosis of debris from all oceans of the world and the identification of the highest levels of waste disposal that is most necessary for the removal of waste.
Currently, the standard for floating waste management requires the use of a manta trawl. Techniques that require manta trawls (or similar ground-collection devices) that use the physical removal of marine debris as a first step and then analyze the collected samples as a second step. The need for pre-analysis removal is very costly and requires significant oversight - preventing the safe transfer of marine waste monitoring services to all Earth's marine bodies. Without better monitoring methods and samples, the overall impact of water pollution on the entire environment. This study revealed an unusual flow of activity that used images taken from aquatic debris as roots. Produces quantification of marine plastic or waste incorporated into photographs to perform accurate quantification and body removal. This model is trained in the ImageNet Large Visual Recognition Challenge using the 2012 data, and can distinguish between many different classes such as cardboard, glass, metal, paper & plastic. This program uses the transfer of learning from the existing model and then returns it to separate a new set of images. Workflow involves creating and processing domain-specific information, building an object acquisition model using a deep neural network.

2.7	**Predict and Diagnose Malnutrition among children in India**

Group Members: Vedant Sawant, Gaurav Patil, Muskan Paryani, Shivani Shenai
Mentor: Mr. Richard Joseph

Abstract: Malnutrition is one of the prime causes of infant mortality among various developing countries such as India. Our study aims to identify the most important features available in the Indian Demographic and Health Survey (IDHS) dataset and design a prognostic model for diagnosing malnutrition using these key features. Demographic and Health Checks (DHS) are conducted every 5 years nationwide, supplying data for an extensive range of tracking, monitoring, and evaluating pointers in the areas of nutrition, health, and population. In this project, we have taken the machine learning approach to identify the various features influencing malnutrition which has not been linked to existent literature yet. We have also identified the degree to which these features influence malnutrition.

2.8	**AttenQ-Attention Span Detection Tool For Online Learning**

Group Members: Pooja Arun Koshti, Arya Gulshan Paryani, Juhi Haresh Talreja
Mentor: Mrs.Vidya zope

Abstract: The global pandemic of Covid-19 has caused educational institutes all over the world to shut down and switch to digital versions of the classroom. As per research conducted, it has been uncovered that the attention span of students has gradually reduced due to online learning. This can have ill-effects on their mental capability. In order to address the problem, we aim to build a system that would monitor the activities of students throughout the session and provide the teacher with the information regarding the attention span of students with the help of a dashboard. The system will make use of computer vision and feature detection methods in order to provide precise information about the student activity. The factors taken into consideration are the face detection, eye position estimation,head pose estimation, and drowsiness detection of the student to determine whether a student is attentive in class or not.

2.9	**SehatCo - Smart Food Recommendation System**

Group Members: Aniket Pawar, Jayesh Shadi, Shubham Mishra
Mentor: Mrs. Lifna C.S.

Abstract: Amidst Covid-19, nutrition has become a very important aspect of everyone's life since the major factor in helping us prevent this deadly virus is a person's own immunity. In addition, picturing food has become a major hobby now-a-days. Social media comes with a huge amount of food images posted each day. Most people will not be able to identify food, and to determine it directly will be very difficult. So the system proposed helps to not only help to track the food details but also eliminate the chance of eating ingredients which are poor against covid. As a result, we propose a system which uses image processing techniques to

extract features and convolutional neural networks that can distinguish and label different features in the image, and then provide a cooking environment. Recipe1M provides the largest open access to recipe data, allowing high-quality models to be trained in targeted, multimodal data. In addition, by adding a high-level separation process, we show that doing so enhances the return of full functionality to humanity while enabling semantic vector calculations. The ingredients predicted then are matched with our sophisticated Covid-dataset which contains ingredients useful for fighting against covid and accordingly stats for a recipe are displayed with recipe recommendation as well with the same set of predicted ingredients.

3.	**Internet of Things & Robotics**
3.1	**Angle of Steering Rotation in a Self-Driving Car**

Group Members: Neeraj Gwalani, Navin Kachhela, Chandan Panjwani, Vipul Devnani

Mentor: Mrs. Abha Tiwari

Abstract: An exciting new era that has come into focus is the age of self-learning and automation, where one of its applications is the self-driven vehicles. In the present era, humans no longer care about the obstacles in the driving paths or the stressful rush hour traffic, since the automated vehicles can help reach the destination fast and efficiently. Udacity has provided a dataset containing a set of images with steering wheel angle recorded during driving. With the help of the dataset provided, prediction of the steering wheel rotation angle can be done. In order to predict the angle, computer vision is used. It is the main technology facilitating self-driven vehicles. In this project, a system is created to drive a vehicle automatically without any human input requirement. ML models like CNN and OpenCV are used for certain applications to detect an object, vehicle, traffic sign etc. The project is deployed as a simulation software that provides the output in a frame. There are two frames: one that consists of the steering wheel and another that consists the road.

3.2	**MIME: Movement in Modern Electronics**

Group Members: Roshnee Matlani, Roshan Dadlani, Sharv Dumbre, Shruti Mishra

Mentor: Mrs. Abha Tiwari

Abstract: Gesture-controlled laptops and computers have recently gained a lot of traction. Leap motion is the name for this technique. Waving our hand in front of our computer/laptop allows us to manage certain of its functionalities. It's a lot of fun to do so. Over slides and overheads, computer-based presentations have significant advantages. Audio, video, and even interactive programmes can be used to improve presentations. Unfortunately, employing these techniques is more complicated than using slides or overheads. The speaker must operate various devices with unfamiliar controls (e.g., keyboard, mouse, VCR remote control). In the dark, these devices are difficult to see, and manipulating them causes the presentation to be

disrupted. Hand gestures are the most natural and effortless manner of communicating. The camera's output will be displayed on the monitor. The concept is to use a simple camera instead of a classic or standard mouse to control mouse cursor functions. The Virtual Mouse provides an infrastructure between the user and the system using only a camera. It allows users to interface with machines without the use of mechanical or physical devices, and even control mouse functionalities. This study presents a method for controlling the cursor's position without the need of any electronic equipment. While actions such as clicking and dragging things will be carried out using various hand gestures. As an input device, the suggested system will just require a webcam.The suggested system will require the use of OpenCV and Python as well as other tools. The camera's output will be presented on the system's screen so that the user can further calibrate it.

| 3.3 | **Unremitting Surveillance: A Patient Monitoring System** |

Group Members: Parthesh Pawar, Sanket Jangale, Kunal Kotkar, Aashish Nagpal

Mentor: Mr. Richard Joseph

Abstract: The Covid-19 Pandemic has affected the entire world. Most notably, the healthcare industry has been under constant pressure to treat patients. Spikes in the number of patients have put the workforce under tremendous pressure. Doctors and nurses are finding it difficult to observe multiple patients at the same time. In addition to that, medical practitioners are reluctant to deal with the diagnosis and treatments, as it requires frequent physical intervention. The aim of this project is to reduce this strain on medical practitioners by developing a system that aims to constantly track the activity of the patients and replicate the same using a 3D Human Model. For this multiple Inertial Motion Sensors (IMU's) are used that will collect the motion data of the joints of the patient, with help of which our 3D Model will replicate the actions. The system will use Internet Of Things and Cloud Computing to collect and transfer data to the web application. All the activity of the patient can be monitored using fully authenticated web applications by doctors and even by the family members. Thus with the help of the technology patients can be monitored without any physical intervention and the risk of getting affected by viruses or diseases for the doctors is also minimized.

| 3.4 | **Predicting the effect on Energy Sector and Greenhouse Gas (GHG) Emissions dependency due to electrification of the Indian Automobile Sector using Machine Learning.** |

Group Members: Hritwik Ekade, Ajay Gupta, Neel Bhagat, Sparsh Amarnani

Mentor: Mrs. Goecey shejy

Abstract: Global Warming continues to be the most critical man-made issue in the modern world. Global Warming causes a rise in temperature which could lead to melting glaciers,

which would cause severe floods, droughts, and other extreme weather conditions. To tackle this looming threat over the whole world, most of the countries are reducing their carbon emissions across various sectors by using various innovative ways. In 2015, India signed a landmark Paris climate agreement with more than 170 countries, marking an important step that unites developing and developed countries in the fight against global warming by reducing GHG emissions. In India, the transport sector is the largest user of oil, which has resulted in it becoming the second-largest source of CO_2 emissions worldwide [1]. India hopes to reduce its GHG emissions by introducing electric vehicles across several segments in the Indian Automobile Sector. In this paper, we analyze and predict the effect on GHG emissions, while factoring in the growth of electric vehicles in India. India has also set a national goal of achieving 30% electric vehicle penetration across multiple segments by 2030 and introduced the NMTMBS to improve local EV production.

4.	Image Processing
4.1	**Form Scanner & Decoder: Extraction of Text from an image of any Application Form and its Language Translation Using OCR**

Group Members: Harish Kumar, Anshal Prasad, Ninad Rane, Nilay Tamane

Mentor: Dr. Mrs. Sharmila Sengupta

Abstract: Computers and phones may be more common than ever, but most people still prefer the traditional way of writing with ink on paper. People in the rural parts of India are mostly comfortable with the pen and paper way of going about their work. But with rapid technology advancements, everything has gone digital from Aadhar card forms to Birth Certificates. Despite this easy availability of a vast number of technical writing tools, many people choose to take their notes traditionally in the written manner in the language they are comfortable with, which is usually Hindi. Our work is on word recognition of handwritten Hindi characters and its implementation on handwritten forms. Our paper introduces an end-to-end word spotting system for the Hindi language using Segmentation based approaches. Our proposed architecture implements an end-to-end strategy that recognizes handwritten Hindi words from printed forms and is translated into English. Hence, handwriting recognition and translation interpret the Hindi handwritten input from various handwritten sources, such as paper documents, forms, into digital form translated into English. A form recognition system handles the formatting, performs correct segmentation into characters, and detects the Hindi words, which are then translated into English and shown on the form. The computational study of people's opinions, sentiments expressed is termed as sentiment analysis which is also known as opinion mining. For the feedback forms, sentiment analysis is performed using Random Forest algorithms and NLTK libraries like Porter stemmer and Stopwords are used giving an accuracy of 88%.

| 4.2 | **INSTA HEARING- Speech to Sign Using Animations** |

Group Members: Varsha Sablani, Mirudhula Nadar, Surabhi Soni, Diksha Ramnani

Mentor: Mrs. Sujata Khandaskar

Abstract: During childhood, children's teachers, parents or grandparents read them a lot of fantastic stories. They did that for the time we couldn't read. Unfortunately, not everyone is blessed with the ability to hear. The children with hearing impairments might not have had a chance to know such stories at least in their childhood. This project is based on a website that converts audio to sign language. It will be useful to both normal and deaf people. In this project, we will also use audio to sign language translators using python. In this, it takes audio as input, searches that recording using google API, displays the text on a screen and finally, it gives the sign code of the given input using the ISL (Indian Sign Language) generator. In this project, we will first convert the audio to text and then sign language.

The purpose of this project is to review the literature on hearing impairment, specifically the impact of hearing impairment on the functioning of elders, children's or any common people interventions that minimize the impact of hearing loss on functioning, and identification of issues raised by the review for nursing research. The results of intervention studies suggest that hearing devices can improve psychosocial and communication outcomes, but behavioural interventions have not shown long-lasting benefits. For nurses to assist elders and their families manage the impact of hearing impairment, further research is needed in several areas that have been poorly explored. This project highlights the important elements of interaction between the disability and community.

4.3	**Prime Era- One Place for Learning Fundamentals of Indian regional Languages and Indian Sign Language**

Group Members: Siddhesh Gadge, Siddhesh Bhere, Rohit Jadhav, Kedar Kharde

Mentor: Mrs. Indu Dokare

Abstract: It is never too late to learn anything new, no matter how old you are. India is a country where people speak a wide range of languages, with each state having its own language. Yet there are very few online resources and platforms for Regional Languages. In recent times there is an increase in demand for self-learning apps. Many people find themselves comfortable learning at their own pace. One of the main obstacles for teaching a language is to teach the writing of a letter. In the traditional method of teaching, the instructor teaches the students how to draw a letter and guides them if they make any errors. We are providing the same level of sophisticated approach for teaching to write the letters. We are developing a Language Learning Web application that will assist people of all ages in learning the fundamentals of the two regional languages Marathi & Bengali language in a user-friendly manner via well-prepared and organized video lessons teaching them how to pronounce and write Marathi, Bengali letters by providing them a canvas where they can practice the letter writing and check the correctness with help of voice commands. This is where we bridge the gap between traditional and self-learning methods using AI. The web application aims to

provide the user a platform to learn and practice the fundamentals of Indian regional languages Marathi, Bengali. The main goal while teaching a regional language to write the letter is to recognize the letter and tell the user if he/she has drawn it correctly or not. Our system will facilitate the option for writing the letter and recognizing its correctness by the audio response. People from any age group can access this website for learning purposes. It provides quick, easy, and anytime access to users. Due to the lack of learning resources in rural areas, such a system will be helpful for those people. The facility of video tutorials and audio response features will make this system more user-friendly. Indian Sign Language (ISL) is used in the deaf community all over India. The World Health Organization's (WHO) survey states that above 6% of the world's population is suffering from hearing impairment. Parents of deaf children are not aware about sign language and its ability to remove communication barriers. So along with regional languages marathi and bengali, we are also adding Indian Sign Language where users can learn hand signs of ISL through our web application.

| 4.4 | **Sainnya Sahyogi: an image captioning System for military** |

Group Members: Vanshika Bhavnani, Gunjan Bhawsinghka, Jaishree Golani, Deepika Mangnani

Mentor: Mrs. Rupali Hande

Abstract: Due to the spread of technology and the immense development in deep learning, a lot of fields have gained a significant amount of attention from the researchers in the past few years, in the fields of computer vision and natural language processing. Image captioning is a process where computers learn to generate one or more sentences which can effectively explain the visual content of an image, just like humans do. The process of automatically generating descriptions of an image with one or more natural language sentences is called image captioning. The proposed system focuses on providing captions for images captured so that it would help the military to inspect the images easily and in less time. In the paper, a method is proposed in which the image file will be provided as an input and then its appropriate description will be produced as an output. It is a tedious task to determine the appropriate description for an image considering all the objects and scenes so, in order to generate the proper interpretation of an image, it requires the ability to recognize the object, the scene and the relationship among them all. This can easily be done with the help of neural based methods i.e. CNN-RNN. For training the model, Flickr30k Dataset will be used which consists of 30k images and each image has its five captions describing the image. In order to generate a new caption, the LSTM network is used. LSTM is a solution to the short-term memory problem of RNN and can remember and process long sequences and thus, can generate the output sentence i.e. caption for the given features of the image.

5.	Networking & Security
5.1	**Querencia- An Encrypted Biometric authenticated ATM System**

Group Members: Riddhi Khole, Nidhi Rohra, Nachiket Joag, Muheet Rashid

Mentor: Mrs. Mannat Doultani

Abstract: Taking a look into the past several years, we see that people have become more conscious about their privacy and security. Moreover, the cases of theft and robbery have also increased in which a huge number of cases involve ATM robbery. Usually, Banks issue an ATM card along with a PIN to customers but these PINs can be easily hacked.Choosing a biometric framework helps provide Identity for a person based upon various anomalous characteristics and specialties. The proposed system aims to improvise the existing systems by introducing new technologies. It ensures ease of access to the customers and a multi-layer secured system for transactions.

5.2	**e-Voting System Using Blockchain**

Group Members: Prasad Govekar, Bhavika Motwani, Karan Sachdev, Nitesh Duseja

Mentor: Mrs. Pallavi Gangurde

Abstract: Increasing digital technology in the present helped many people's lives, especially in the post-covid era. Unlike the usual electoral system, there are many conventional uses of EVMs in its implementation. The aspect of security and transparency is at a threat from still widespread elections with the conventional system (offline). General elections still use a centralized system, there is one organization that manages it. Some of the problems that can occur in traditional electoral systems is that with an organization that has full control over the database and system, it is possible to tamper with the database of considerable opportunities. Blockchain technology is one of the solutions, because it embraces a decentralized system and the entire database is owned by many users. Blockchain itself has been used in the Bitcoin system known as the decentralized Bank system. By adopting blockchain in the distribution of databases on e-voting systems can reduce one of the cheating sources of database manipulation. Also, The fact that EVMs can be tampered, can't be ignored. Blockchain, is again an effective solution for the same. Adopting blockchain for e-voting systems can help us avoid crowding at the polling booths, violence and riots, like we've seen during Bengal 2021

elections. It will also reduce the time and effort required in the traditional system of voting, while giving us a higher percentage of transparency and security.

There is no doubt that the revolutionary concept of the blockchain, which is the underlying technology behind the famous cryptocurrency Bitcoin and its successors, is triggering the start of a new era in the Internet and the online services.other trending, yet critical, topic related to the online services. The blockchain with the smart contracts, emerges as a good candidate to use in developments of safer, cheaper, more secure, more transparent, and easier-to-use e-voting systems.

As the world keeps advancing, we will need to find digital substitutes to many of the traditional systems. Voting is one of them. Blockchain technology is very underrated at the moment. A decade down the line, everyone will be willing to work around this technology after knowing it's potential.

Keywords — blockchain; ethereum; smart-contracts, e-voting.

6.	Cloud Computing
6.1	**Automated Visual Inspection of Silicon detectors in CMS experiment**

Group Members: Amit D. Chhabria, Priyanka Asrani, Rashmi Manwani

Mentor: Dr. Mrs. Nupur Giri

Abstract: In the CMS experiment at CERN, Geneva, a large number of HGCAL sensor modules are fabricated in advanced laboratories around the world. Each sensor module contains about 700 checkpoints for visual inspection thus making it almost
impossible to carry out such inspection manually. As artificial intelligence is more and more widely used in manufacturing, traditional detection technologies are gradually being intelligent. In order to more accurately evaluate the checkpoints, we propose
to use deep learning-based object detection techniques to detect manufacturing defects in testing large numbers of modules automatically.

6.2	**CCE: Crowd Counting and Estimation**

Group Members: Divesh Hariani, Paras Gurnani, Aakash Vanjani, Sahil Ramrakhiyani

Mentor: Mrs. Lifna C.S.

Abstract: Socializing was prevented by the Covid-19, which erected barriers to social connection such as social separation. Authorities established standards for preserving social distance in public spaces following the outbreak for people's protection. Authorities, on the other hand, found it difficult to manually save the protocol in areas like restaurants and shopping centers. The paper proposes the use of deep learning techniques, to assist authorities in limiting the number of visitors at a given public place. The system's aim is to make use of the camera's pictures to estimate the population in the frame; if the number of people in the

frame reaches a certain threshold, the authorities will be notified and can take action.

6.3	**Creating a Machine Learning Model to Predict Success of a CrowdFunding Campaign**

Group Members: Mohit Peshwani, Abhishek Odrani, Saurav Kalaskar, Daksh Ramchandani

Mentor: Mrs. Richa sharma+co_guide(Rohini Temkar)

Abstract: Crowdfunding websites provide an accessible platform for creators, innovators and entrepreneurs to get funding directly from their customers in return for tangible rewards such as special packages, etc. Most of these crowdfunding campaigns are a success, although some of them also fail. The reasons behind their success and failure include communication of campaign ideas to the customers, customer excitement, social media marketing, domains, websites, countries they live in, etc. Our Machine Learning model aims to analyze these various factors and find the correlation between them and the success/failure of a campaign. We present this information to potential creators, innovators, entrepreneurs so that they can make a better decision as to what campaigns they can launch, how to successfully market them, etc. All of this is done by finding out which set of algorithms works best for our datasets and how much accuracy can be expected from different domains.

6.4	**Quality Assurance of Silicon detectors in CMS experiment and Particle shower classification using Deep Learning**

Group Members: Swarangi Dali, Ajay Singh Khalsa ,Vaishnavi Ainapure

Mentor: Mr. Richard Joseph

Abstract: A substantial number of HGCAL sensor modules are manufactured at advanced laboratories across the globe for the CMS experiment at CERN in Geneva. Each sensor module comprises around 675 checkpoints for visual inspection, making manual inspection practically unfeasible. In the industrial environment of manufacturing these sensor modules, this task is awfully difficult due to diverse defect appearances, ambiguous intraclass, and interclass distances. Due to recent technological advances, there has been a rise in automated visual inspections and intelligent quality assurance systems in manufacturing. In order to simplify this, we propose a deep-learning-based approach for defect diagnosis and subsequent quality assurance.

7.	**Application Design & Product Development**
7.1	**MyDietDiary - Diet Recommendation System**

Group Members: Shreyas Shamkant Kotkar, Yashkumar Sudesh Jain, Chirag Sunil Kinger, Vikram Kamal Virwani

Mentor: Dr. Mrs. Gresha Bhatia

Abstract: The Objective of our Project is to design, increase and examine a recommender machine capable of verifying nutritional intake, the use of a proven Food Frequency Questionnaire (FFQ), and recommend legitimate customized nutrients recommendation for adults. It is investigating a powerful manner of supplying customized online nutritional pointers to growth weight loss programs, nice at populace degree and of thinking about a man or woman user's preferences, populace statistics and experts' knowhow within the recommendation.

7.2	**Automated Product Tagging for Apparel**

Group Members: Riya Matwani, Siddhi Mejari, Disha Lund, Namrata Tolani

Mentor: Dr. Mrs. Sujata Khedkar

Abstract: There has been a significant increase in both e-commerce providers and consumers since the introduction of digitization. To find what they're looking for, people mostly use a text-based search engine. Surprisingly, the textual enquiry in question is usually regarding a visual characteristic. While the user may see a variety of products in their search results, many things that meet that visual description are missed since they aren't properly classified and tagged. Product tags are keywords that are associated with each item. Not only tagging is crucial, but it must also be homogeneous. Several attempts to automate the work of tagging have been made in the past, but each has had its drawbacks. The quality of the dataset and attributes accounted for, have a considerable impact on the task's efficiency. Many of the systems have benefited from the use of transfer learning. Using a large dataset and transfer learning models, we attempted to develop a system to automate the tagging process.

7.3	**Krushi Vikas - Multiservice app for Indian farmers**

Group Members: Mahek Nagdev, Sejal Budhani , Roshni Kataria, Jayesh Dhanrajani

Mentor: Dr. Mrs. Sujata Khedkar

Abstract: India is one of the largest populated countries in the world and over 58% of the population has agriculture as the occupation. The idea is to develop an application that will be useful for farmers in order to reduce their basic agriculture related struggles. Farmers are cultivating similar crops repeatedly and they are using random pesticides/fertilizers instead of using the required quality and quantity, which leads to affecting the crop yield and giving rise to the soil acidification and contamination of the soil layers. To eliminate issues like these, we designed a web application using machine learning algorithms which will help the farmers in

various ways and Our web app will recommend the optimal crop for a certain piece of land.and time of the year based on content and weather parameters.The web app provides the information about the required content and quantity of fertilizers, required seeds for cultivation. The solution for stopping the losses in agricultural product yield and quantity is early detection of plant diseases. The study of plant diseases includes the evaluation of the clearly visible patterns on the plant leaves. For sustainable farming, disease detection on the plants directly should be avoided, therefore image processing is used for the detection of plant diseases. Solutions to problems like inability of some farmers to buy expensive tools for their fields because they prove to be budget busters, significant yield and quality constraints like plant diseases which cause huge loss economically, lack of knowledge among farmers regarding maximizing crop yield and crop rotation techniques, etc will be targeted by our system.

7.4	**Aatmanirbhar Sanchar: Self-Sufficient Comms**

Group Members: Jay Jhaveri, Abhay Gupta, Prem Chhabria, Neeraj Ochani

Mentor: Dr. Mrs. Sharmila Sengupta+Co-guide(Mrs. Sunita suralkar)

Abstract: "Aatmanirbhar Sanchar" aims at providing the users with a real-time off-the-grid, secure, and anonymous messaging service. We are going to fulfill these claims by not incorporating any third-party APIs or other services. Our application is a cross-platform ephemeral anonymous messaging service providing End to End encryption while also enabling secure transmission of any kind of data files including but not limited to images, videos, and documents. The most unique feature of our product is the use of our very own indigenous private server and database system without the inclusion of any third-party cloud servers.

7.5	**Vayu - A mobile friendly pollution control to meet sustainable development goals.**

Group Members: Sarthak Thakur, Anjali Badlani, Harshita Kanal, Sanket Chaudhary

Mentor: Dr. Mrs. Sharmila Sengupta

Abstract: The Sustainable Development Goals (SDGs) are a collection of Global goals aimed at making the world a better, more sustainable place for everyone. Air pollution, along withClimate change, is one of the most important environmental threats to public health. Improving air quality can aid in climate change by controlling emissions to improve air quality. Mobile is a key enabler of SDG. It can be used as a medium to prevent, control and mitigate air pollution challenges. The goal is to propose a granular AQI data collection via sensors that can be embedded in mobile devices, eliminating anomalies and irregularities in data received through conventional sensor station systems. The proposed application to obtain real-time AQI data through mobile devices would be interfaced through cloud services to the end-users making data consistently available 'on the go' based on which awareness and

preventive measures can be incorporated. As we are moving towards 5G/6G mobile technology most of the earlier phones, as well as the IoT devices used for collecting pollutant concentration, will be discarded; generating huge amounts of e-waste, leading to management of another SDG. Therefore accountability of AQI and e-waste of mobiles will be predicted using machine learning and a study of reusing certain rare metals and components from existing mobiles around the world will be presented.

7.6	**AgriCare**

Group Members: Shreya Shah, Ian Sequeira , Etisha Mathurvaishya, Chinmay Waykole

Mentor: Dr. Mrs. Sharmila Sengupta

Abstract: India is the second leading producer of paddy in the world with annual produce of about 497.7 million metric tons in the year 2019-20. The large fields of paddy require constant care and maintenance. It is critical to recognize the symptoms and understand how we can effectively control the diseases. Thus influenced by this idea, we propose a solution to use machine learning for identification of the disease in paddy plants. Our system "**AgriCare**" uses a real time dataset obtained from the Agricultural Research Institute of Lonavala. Our system can be used to identify four major paddy plant diseases - Leaf Blast, Leaf Scald, Neck Blast and False Smut. In the proposed system, first the images are pre-processed and then the custom Convolution Neural Network is used to classify the images with 99.48% accuracy. By identifying diseased leaves at an early stage, the proposed automated system can aid farmers in preventing further damage to their crops.

7.7	**Telemedicine Data Management System**

Group Members: Anuraag Punjabi, Sakshi Haswani, Kaushal Singh

Mentor: Mr. Prashant Kanade

Abstract: Telemedicine is the application of current telecommunications and information technology to provide therapeutic treatment to those who live far away, as well as the transfer of data. In the real-time management of patients at a distance, telemedicine can be used for decision-making, remote sensing, and collaborative arrangements. Telemedicine is a term that encompasses telecommunications, medicine, and informatics. The equipment and techniques for obtaining, presenting, storing, and retrieving clinical data are all detailed in the medical systems architecture. The difficulties that different countries face as they develop telemedicine are discussed. Telemedicine applications define technological, political, and professional boundaries.

7.8	**Management Information System for Rural Micro Finance Groups**

Group Members: Anurag Singh, Vedant Darak, Harsh Singh, Shubham Singh
Mentor: Mr. Prashant Kanade

Abstract: The primary purpose of Management Information systems in rural Microfinance is to present a mechanism for analyzing information systems, both those bought off-the-shelf and those developed internally. This MIS Evaluation Framework offers the industry a tool to determine the quality of an information system. The framework is very flexible and can be used by MFIs, donors, and other external stakeholders, as well as systems developers. MFIs can use it to evaluate off-the-shelf systems in their search for an appropriate solution. MFIs can use it to appraise the quality of their existing system (off-the-shelf or internally developed) to help identify improvements. External entities can use it to evaluate off-the shelf or internally developed systems to assist an MFI, identify alternatives, or include as part of an institutional appraisal. Software developers and information system planners can use it to build better systems.

7.9	**e-Krishi: A one stop portal for farmers**

Group Members: Jatin Chhabria, Sahil Kochar, Krish Khemani, Yash Wadhwani
Mentor: Dr. Mr. Dashrath Mane

Abstract: Agriculture being the most important occupation of our country, making it easy for functioning in terms of marketing agricultural goods and letting farmers understand what crops are best suited based on soil nutrients, geographical and weather conditions has become very important. Similarly if the farmer wants to grow a certain crop, he/she should be able to know about what artificial nutrients, pesticides, insecticides, etc can be used to improve crop yield. To sell the crops, an online mandi(market) would be very beneficial to the farmer. Similarly to buy pesticides, insecticides and other nutritive agricultural utilities to improve soil health, these products can be listed online and farmers can buy them online. The use of various techniques like ML algorithms and deep learning are recognised as they are capable of dealing with complex data handling problems and accuracy. These techniques are mostly used for various pattern recognition and several classification problems. The main objective of this project is to help understand what plants are best suited depending on various factors and also what additives can be put into soil for growth of a particular crop of his/her interest.

7.10	**FarmEasy - One stop solution for all farming needs.**

Group Members: Hanisha Mohinani, Vinita Chugh, Shivanghee kaw, Om Yerawar
Mentor: Mrs. Indu Dokare

Abstract: Having diseases is quite natural in plants due to changing climatic conditions and environmental conditions. Diseases obstruct the growth of plants and affect their production.

FarmEasy is a one stop solution for all the farming problems that arise for home planters or amateur farmers. It is a website which helps farmers to detect the plant diseases from the leaves of plants such as potato, tomato, grapes, apple and many more. Some of the plant diseases which can be detected are early blight, late blight, target spot, leaf mold, septoria leaf spot, leaf curl, black rot and many more. The detection of the disease will be done by a ML based algorithm which detects the diseases from the plant leaf images. Also, FarmEasy provides the crop recommendation from the type of crops to be cultivated which is best suited for the respective conditions such as nitrogen, phosphorus, potassium, rainfall, ph level and recommendation about the type of fertilizer best suited for the particular soil and the recommended crop by mentioning potassium, nitrogen and phosphorus content in soil. We aim to build a system for the people in need to get the recommendations about the crop and fertilizers used for the particular type of soil and also, early detection of the plant's diseases so that the majority of the plants are saved.

| 7.11 | **Titli-Making Life Easier For Women** |

Group Members: Khushboo Bhatia, Priya Gangwani, Jasika Sukheja, Kirti Patil

Mentor: Mrs. Priya R.L.

Abstract: Titli is an Application that acts as an empathetic friend to the user by having friendly conversation .As awareness for mental wellbeing is increasing , Tittli can act as a preliminary measure to cope with stress, anxiety , depression , loneliness.As contextual conversation agents are gaining more popularity, this is an attempt to make a chatbot to understand human emotions. It has a contextual chatbot using the Rasa framework that understands the intention of user texts with the help of Natural Language Understanding (NLU).Rasa is an open source framework for building contextual AI chatbots.Rasa's NLU part helps in understanding user texts and Rasa core generates responses using reinforcement neural network Apart from chatbot , the app provides features like searching recreational activities in the vicinity, fun activities and tips and tricks by experts for mental health.

| 7.12 | **AutoMark - Convert Mock-Up Sketch to Mark-Up Code** |

Group Members: Gautam Pamnani, Tanish Sahijwani, Muskan Tanna, Bhavesh Lohana

Mentor: Mrs. Rohini Temkar

Abstract: User Interface (UI) design is an important part of software development. Creating an intuitive and engaging user experience is a key goal for businesses of all sizes and is a process driven by rapid prototyping, design, and user testing cycles. It requires a significant amount of money and effort just to build a production-grade website. It's difficult to generate code from photos. The insight goal is to use modern Deep Learning algorithms to significantly simplify the design workflow and enable any business to quickly create and test web pages.

The proposed Deep Learning model consists of a Convolutional Neural Network (CNN) encoder segment and a Gated Recurrent Network (GRU) decoder segment which is trained on a custom database of wireframe sketches and their corresponding code. The network will produce the HTML code, corresponding to the sketch image that is fed into the proposed model.

7.13	**Smart Antivirus System**

Group Members: Praneel Rastogi, Aditya Mohan, Mayank Motwani, Dinesh Kannan

Mentor: Mrs. Goecey shejy

Abstract: In today's world, malware attacks seem tremendously dangerous. Any incoming foreign traffic from the internet, local networks, or portable devices can be malicious in nature. This makes the jobs of anomaly detectors and antivirus software and firewalls all the more difficult. Regardless of how advanced and up-to-date this security software is, the developers of malicious software always find a loophole in their structures. Among the currently available open-source security software, only a select few are capable of offering advanced protection. However, these advanced features tend to be available in paid versions of the software and are not open-source. This study provides the users with open-source security software which has a strong framework consisting of all important components including Web Application Firewall (WAF), Security information and event management (SIEM), and Malware Detection using Machine Learning.

7.14	**Eye Explorer**

Group Members: Nishikant Patil, Chetan Urkude, Aashish Vaswani, Girish Vaswani

Mentor: Mrs. Mannat Doultani

Abstract: A cataract leads to a decrease in vision because it forms a cloudy area in the lens of the eye. Those who are suffering from cataracts may have a clouded or dim vision. Clouded vision caused by cataracts may lead to double vision, sensitivity to bright sunlight, lamps, or headlights. The WHO informs that cataract is one of the world's leading causes of blindness. Even though cataract majorly affects the elderly population however now they can be seen among minors too. Nuclear, cortical, and post-subcapsular cataracts are three of the most common forms of cataracts that afflict masses in large numbers. Cataract detection from the retina is costly with a fundus camera since it requires an expert to perform the procedure. The camera is also not portable. We are aware that medical facilities in distant locations are limited, and that clinics in those areas cannot afford the expensive machines required for cataract detection. The method of detecting cataracts with this machine is equally time-consuming. We have built a system that will work on the detection of cataracts and type of classification on the basis of severity namely - normal, mild, and severe, in an effort to scale back errors of manual

detection of cataracts in the early ages.

7.15	**Samvaad - An app to talk to hearing impaired**

Group Members: Gurudatt Gaonkar, Aakash Motiyani, Anand Pal, Vaibhav Boliya

Mentor: Mrs. Nusrat Ansari

Abstract: Communication has been defined as an act of conveying intended meanings from one entity or group to another through the use of mutually understood signs and semiotic rules. It plays a vital role in the existence and continuity of humans. For an individual to progress in life and coexist with other individuals there is the need for effective communication. The indicators of poor communication include inattentiveness, arguments, vilification, and language barrier between the communicators. However, if the computer can be programmed so that it accepts audio speech or text as an input and output corresponding to Indian Sign Language, the difference between normal people and the deaf community can be minimized.

7.16	**Money Heaven - The Complete Financial Analyzer**

Group Members: Baldev Arjundas Sundarani, Abhishek Rameshrao Waghmare , Hitesh Gyanchand Santani, Simran Sunil Gurnani

Mentor: Mrs. Nusrat Ansari

Abstract: "Money Heaven" is a one-stop destination for financial services and forecasting the future. It assists customers in managing their stock, cryptocurrency, and other investments. Our goal is to empower customers to manage, save, and earn more by combining their complete financial life into one application, including investments, health insurance, asset insurance, and so on. Money Heaven's main goal is to forecast future prices for the user's investments. Predicting price movements in the stock market and cryptocurrencies with accuracy is a major economic benefit. Because of the volatility and non-linear character of the global stock markets, accurately predicting stock and cryptocurrency market returns is a difficult endeavor. Machine learning makes use of a variety of models to create accurate predictions.Given the high number of newcomers to the stock market, it is critical to provide a one-stop destination for managing all of an individual investor's funds. Managing several investments across many platforms can be hectic and time-consuming. Before investing their hard-earned money in the stock market, a novice must understand the previous trends of each share and make predictions about future prices. Our goal is to assist investors in investing in the appropriate companies and growing their money, because the capacity or skill to transform earned income into passive income is the key to financial freedom and enormous wealth.

7.17	**NutrifyMe - your personal nutritionist**

Group Members: Sakshi Lalchandani, Anjali Hassani, Nupur Patil
Mentor: Mr. Sanjay Mirchandani
Abstract: People frequently neglect their health as a result of evolving technologies, changing lifestyles, and hectic schedules. This has sparked a public uproar concerning health-related issues among people of all age groups. Young people are the most vulnerable to health problems since their irregular schedule makes it difficult to keep track of their food intake and maintain a manual health record. The popularity and widespread use of smartphone applications have necessitated the development of an app that can meet the needs of young people in terms of health management. Every individual, whether an infant, a growing child, a pregnant or nursing woman, or an elderly person, has varied dietary needs. Diets fluctuate from person to person depending on a variety of criteria such as age, gender, physical activity, nutritional requirements at different periods of life, and other considerations. NutrifyMe, the developed web application, focuses on this aspect and it has been designed in such a way that it records the user's age, gender, height, weight, goals, and activity levels; and based on that suggests the supplements to be included and excluded from the diet. It further provides additional information like the nutritional content of the meals, food recipes, and also suggests exercises to manage those calories. The application is developed using React "^17.0.1", which is one of the most famous and widely accepted ways to build big, fast web apps with javascript. Firebase is used for data storage and the entire website is responsive, increasing its accessibility on all the devices.

7.18	**The road to Swasth Phasal: E-farming portal**
Group Members: Vishwesh Rajendra Jagtap, Siddarth Prakash Bugtani, Yashvi Ashok Hiranandani, Kabir Rajesh Rajpal	
Mentor: Mrs. Pallavi Saindane	
Abstract: Since over 12000 years agriculture has been a backbone of our country. In the start it was mainly man-power and the farmers had to face not much problems. But this road hasn't always been smooth. The problems have not only been increasing in intensity but also finding a solution for it hasn't been easy. Resource degradation, rapid population growth, disease, changing climates, and other forces have periodically crippled food supplies, with the poor farmers bearing the brunt of famine. In this 21st century, ICT has revolutionized every aspect of life, including agriculture, which gave rise to E-farming. It was started with the aim to provide food security, but over the years it has taken a great turn. Future agriculture will use sophisticated technologies such as robots, temperature and moisture sensors, aerial images, and GPS technology. These advanced devices and precision agriculture and robotic systems will allow farms to be more profitable, efficient, safe, and environmentally friendly. So with the help of this paper, we intend to study all the technological advancements in agriculture over the years.	
7.19	**Samaan - Everyone has a chance of a better life.**

Group Members: Sadhvi Naresh Ganuwala, Hitika Kamlesh Hemnani, Paridhi Inder Harpalani, Arya Sachin Telavane

Mentor: Mrs. Pallavi Saindane

Abstract: Down's syndrome is one of the most common hereditary disorders. The characteristic facial features of Down's syndrome provide a method of automatic identification. Recent studies have shown that facial recognition techniques can identify hereditary disorders. Currently, in computer vision in the field of DS face recognition, the challenge is to build an automated system that matches the human ability to recognize the face as one of the symmetrical structures of the body. Early detection is beneficial to the development of children with this disability, but it requires advanced medical examinations that are not universally available. In developed countries, Down syndrome is often found during prenatal screening. However, in developing countries, these tests are often not available. Here, we develop a method to identify Down's syndrome using facial images and deep convolutional neural networks. In obvious cases, this can easily be seen from the newborn. But in subtle cases, this is very difficult even for geneticists and experienced morphologists. To assist in the diagnosis of these cases, we are developing a computer program to detect Down's syndrome shortly after birth.

7.20	**Automated MCQ generation using Deep Learning**

Group Members: Chetan Naik, Soham Kamat, Saloni Ingle

Mentor: Mrs. Veena Trivedi+Co-guide(Mrs. Pallavi Gangurde)

Abstract: Automatic question generation specifically MCQ based is a widely appreciated application of natural language processing and deep learning. Since the dawn of the pandemic, the world has shifted towards the online paradigm along with universities and institutions. Hence, examinations and assessments are going through a huge change. Most of the institutions have changed their examination pattern towards objective- based questions. However, the manual generation of objective questions and designing specific options/distractors is a tedious task. Multiple Choice questions is the go to assessment technique used for competitive entrance exams, company's aptitude screening process and for the assessment exams of various institutions and universities. The rise of the online paradigm due to the pandemic has also changed the way universities and institutions conduct their assessment exams. Hence, MCQs play an important role in assessment of skill and knowledge in different domains and situations. However, it becomes very difficult for a human to generate large amounts of MCQs along with good quality distractors in limited time. This problem can be solved using state of the art natural language processing and deep learning techniques. Our work is an attempt to generate multiple choice based questions which can be used for assessment in an exam setting. This project proposes a system which uses T5 transformer for question generation and other state of the art deep learning techniques for distractor generation to generate multiple choice questions which resembles the human way of questioning.

T.E. PROJECTS

II.	T.E. Mini Projects
1.	**AI, Deep Learning & DWM**
1.1.	**Al-based Virtual Interpreter for the Hearing Impaired**

Group Members: Vishesh Mittal, Paras Patil, Kapish Madhwani, Akshita Upadhyay

Mentor: Dr. Mrs.Nupur Giri

Abstract: Communication is an essential aspect of professional as well as non-professional life. However, it becomes extremely difficult for non-impaired to convey as well as understand the hearing-impaired thereby, increasing the complexity of certain tasks. Additionally, there are only 250 certified interpreters in India and with every 4 out of 1000 children suffering from imparity, there is a severe shortage of interpreters. Thus, this project aims to create a solution to this problem with an AI-based translator.

1.2.	**Climate, Air Pollution and Forest fires: Al based models for Indian case study.**

Group Members: Aashish Ramesh Raheja, Kartikey Verma, Ashwin Pansare

Mentor: Dr. Mrs.Nupur Giri

Abstract: A FSI study showed an increase in forest fires in India since 2004-05 i.e 8,654 forest points which went up to 30,892 in 2009-10 and further surged to 35,888 in 2017. As a forest burns, large amounts of smoke are released into the atmosphere. Air pollution from fires has the potential to travel great distances and oftentimes may pose a threat to human health. We will develop a web based system that will predict the forest fire for a given region and the changes in pollutant caused by that forest fire. Our project aims to cover maximum districts from Pan-india covering 13 most vulnerable states.

1.3.	**Prediction of Crop prices as a Commodity in the Market**

Group Members: Rakshit Deshmukh, Adwait Shirodkar, Minal Katware, Aditya Khomane

Mentor: Mrs.Sujata Khedkar

Abstract: The agriculture commodity prices are quite unstable and cause harmful effects

on the economy. The objective of the proposed system is to build Web Application or Mobile Application to predict agricultural commodity future prices through analysis of multivariate time series data and to apply machine learning algorithms and predict the price of the crop based on multiple factors like Area harvested, Area planted etc.

1.4.	**Towards attaining SDG with AI: assessment of riverine plastics**

Group Members: Manasvi Patwa, Bhavika Chattani, Sahil Deshmukh, Varnit Batheja

Mentor: Mrs.Sharmila Sengupta

Abstract: Plastic debris has been piled up on dumpsites and found its way into the oceans as a result of widespread usage of plastics and inadequate waste management procedures, adding to the global problem of ocean plastic pollution. There has not been a comprehensive assessment of the amount of plastic that enters the ocean through the Indian riverine system. Even if data for a few rivers exists, unit conversion becomes a real hassle. Natural elements such as river flow, rainfall, and a variety of other factors have made quantitative measurements on river plastic generation difficult to obtain. In this paper, we have calculated and provided plastic waste generated by the major rivers of India for the past 10 years. We also created a model to forecast the amount of plastic waste that Indian rivers will contribute to the ocean over the next five years.

1.5.	**Road Condition Detection**

Group Members: Sneha Karthik, Srishti Shetty, Gauri Mahajan, Mrunmayee Waingankar

Mentor: Mrs. Vidya Zope

Abstract: The presence of potholes on the roads is one of the foremost reasons for injuries as well as wear and tear of vehicles. In order to remedy this problem, diverse strategies were implemented ranging from manual reporting to government to using vibration-based sensors to three-D reconstruction using laser imaging. But all these strategies have some drawbacks along with the high setup value. Therefore, this paper proposes a detection of the road peculiarities such as potholes using Deep learning methods. This Road Condition Detection System paper studies the severity of the road on the basis of the amount of area covered by potholes using the You Only Look Once version5(YOLOv5) algorithm. The proposed system receives pothole images through a camera. After detecting the pothole from the image, we will classify the roads based on their severity, thus notifying the driver. With the test results in our database, we have demonstrated performance of our proposed system.

1.6.	AI based statistical analysis of land-use plastic pollution in India

Group Members: J N Guru Akaash, Nair Ajay Ravidran, Manigandan Kasimani, Varun Tripathy

Mentor: Mrs.Priya R.L

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Abstract: The project aims to calculate India's plastic waste footprint by gathering data on the amount of land-based plastic waste generated over the last ten years in various Indian states. The proposed system would use AI techniques to forecast and visualize the amount of plastic waste that will be generated in the following 5 years given comparable conditions and limits. The recommended solution is based on a 10-year mapping of plastic waste generated in India, and it offers the best recommendations for minimizing plastic waste. Heatmaps will be created to indicate locations with low, moderate, and high levels of plastic waste, as well as recycling plant details. A final report will be produced and given to government departments and other non-governmental organizations, along with recommendations for minimizing plastic waste.

1.7.	Patient Treatment Recommendations Model

Group Members: Radhika Katiyara, Drishti Katiyara, Nikhita Iyer, Maitryee Choudhary

Mentor: Mrs.Priya R.L

Abstract: In the past, considerable amounts of clinical data representing patients' health status have been collected, which has remarkably increased the amount of digital data as a convenient way to recommend treatment effectively. The treatment recommender system is quickly becoming a vital platform for healthcare services. The system treatment recommendation model would predict the disease based upon the symptoms the user has entered and will predict the disease and recommends first-aid and medications based upon the disease predicted. Without suitable First Aid, an ordinary injury or condition could develop into a severe injury; and in some cases, fatalities can take place as a consequence of lack of instant medical treatment. First Aid doesn't just promote quicker recovery; it also helps to save lives. As a result, a Treatment Recommendation System is required to maximize the utilization of advanced medical technology in developed hospitals and the vast medical knowledge of experienced clinicians.

1.8.	Safe Distance Monitoring

Group Members: Shrushti Govindwar, Shruti Mehta, Sonali Bodhwani, Kanchan Nathani

Mentor: Mrs. Nusrat Ansari

Absract: This project focuses on detecting social distance between two people in a video. The Yolo algorithm detects a person and measures the distance between them . If the distance is less than 1 meter the box detecting the person will appear red and if the distance is greater than 1 meter the box appears green . Further extension if this project is the mask detection model. Which will use the same algorithm and detect whether the person is wearing a mask or not.

1.9.	**AI based Aura Imaging**

Group Members: Shivoham Angal, Dhruv Sachdev, Rutvik Purohit, Mrudul Parab

Mentor: Mr. Richard Joseph

Abstract: Aura photography is a high-tech bio-feedback imaging camera that takes a photo of your dynamic electromagnetic field. The objective of our project is to help in visualizing the aura of a person. The aura will also help in determining which chakra has become abnormal i.e. what disease the person may have. Each chakra reveals a particular aspect of your personality and has a specific meaning.

1.10.	**Precision Agriculture using Generative Adversarial Network**

Group Members: Tanya Bajaj, Gharade Abdul Hannan, Aashutosh Alankar Baraskar, Suresh Aydi

Mentor: Mr. Satish Ranbhise

Abstract: The main objective of our project is to identify the crop and weed in an image dataset and segregate them using Generative Adversarial Network. Precision agriculture is an approach to farm management that uses information technology to ensure that crops and soil receive exactly what they need for optimum health and productivity. Thus, this proposed system will be useful in precision agriculture. This will help the farmer and farming robots to segregate crops and weeds in a realistic <u>agricultural scene</u>

1.11.	**Resume Screening Using KNN Algorithm**

Group Members: Vanshika Bajaj, Chandni Megnani, Jasmine Sawara, Rishabh Bathija

Mentor: Mr. Sanjay M

Abstract: The project focuses majorly on the design of a platform which will be used to screen resumes (Curriculum Vitae) for a particular job posting. This system will encourage the job applicant candidates as well as the recruiters to use it for job applications and screening of resumes. Recruitment is a tedious process wherein the first task for any recruiter is to screen the resumes. It is designed in such a way that job applicant as well as recruiters can use it with ease for applying for job openings and screening respectively. The recruiters from various companies can post the details of the job openings available in their respective companies. The system will allow the job applicants to submit their resume and apply for their job postings they may still be interested in. The resumes submitted by the candidates are then compared with the job profile requirement posted by the company recruiter by using techniques like machine learning and KNN algorithm . Scores can then be given to the resumes and they can be ranked from highest match to lowest match. This ranking is made visible only to the company recruiter who is interested in selecting the best candidates from a large pool of candidates.

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Group Members: Vanshika Bajaj, Chandni Megnani, Jasmine Sawara, Rishabh Bathija

Mentor: Mr. Sanjay M

Abstract: The project focuses majorly on the design of a platform which will be used to screen resumes (Curriculum Vitae) for a particular job posting. This system will encourage the job applicant candidates as well as the recruiters to use it for job applications and screening of resumes. Recruitment is a tedious process wherein the first task for any recruiter is to screen the resumes. It is designed in such a way that job applicant as well as recruiters can use it with ease for applying for job openings and screening respectively. The recruiters from various companies can post the details of the job openings available in their respective companies. The system will allow the job applicants to submit their resume and apply for their job postings they may still be interested in. The resumes submitted by the candidates are then compared with the job profile requirement posted by the company recruiter by using techniques like machine learning and KNN algorithm . Scores can then be given to the resumes and they can be ranked from highest match to lowest match. This ranking is made visible only to the company recruiter who is interested in selecting the best candidates from a large pool of candidates.

2	**Big Data Analytics and Machine Learning**

2.1	**Kisan Mitra**

Group Members: Yashraj Desai, Shreyas Poojari, Aniket Chandrapal Dewnani, Mihir Rane

Mentor: Dr. Mrs.Nupur Giri

Abstract: Our chatbot can positively impact underserved communities by solving queries related to agriculture, horticulture and animal husbandry using natural language technology. The farmer will be able to receive agricultural information as well as localized information such as the current market prices of various crops in his/her district and weather forecast through a messaging app. A farmer can directly message our AI enabled system in his/her language, and get an answer. Our system would enable the farmer to ask any number of questions, anytime, which will in turn help in spreading the modern farming technology faster and to a higher number of farmers. Moreover, we found that most of the queries related to localized information such as weather and market prices were redundant. Our Question-Answer system can answer maximum queries on its own without any human intervention with high accuracy. This will lead to better utilization of human resources and avoid unnecessary costs in setting up new call centers. Our system is capable of handling all the redundant queries and getting updated with new queries on the go. The system also provides an option that enables the farmer to ask questions directly to the KCC employees if and when necessary. Above all, we believe that the system helps in analyzing the farmers' mindset and the structure of the Agricultural Sector in India. While the system provides a secure communication channel to the farmer, it also helps the policy makers to understand the needs and concerns of the farmers. The data analysis also provides an understanding of which sector or season farmers require attention. Thus, our decision support system uses all the available resources judiciously to tackle the problem of lack of awareness and information in the agricultural sector in India.

VideoLink:https://drive.google.com/file/d/1x1xIOMeDVS_yFKcPn4Uoo5alEwVKmhvc/view?usp=sharing

2.2	**Optimum proximal fuel station indicator**

Group Members: Garv Rajesh Jhangiani, Muskan Hassanandani, Shreya Hegde, Prerak Moolchandani

Mentor: Dr. Mrs.Gresha Bhatia

Abstract: India is a country with the third largest road network in the world, the total number of vehicles in fiscal year 2019 stood at 295.8 million. The present system recommends fuel stations by just taking distance proximity into account, but it, however, fails to identify congestion at the gas station and the estimated waiting time you have to take out of your trip. These are the problems travellers face every day. The goal of our project is to identify the nearest stations in the user's vicinity and subsequently group them by proximity and arrange them in ascending order of vehicular density to solve large waiting time inconveniences and avoid congestion. Vehicle density will be calculated by the live video feed from the station with the help of image processing and machine learning. Our project also stores all the data collected at various fuel stations (e.g. vehicular count, consumption of fuel on a daily and monthly basis, etc.) in the backend which can thus help in predictive planning and giving insights such as most busy fuel station, the station with best facilities etc.

2.3	**Detecting the Covid-19 healthcare requirements based on social media posts**

Group Members: Himanshu Behra, Aishwarya K, Vaidehi Bhagwat, Ikjot Khurana

Mentor: Dr. Mrs.Gresha Bhatia

Abstract:COVID-19 pandemic has started spreading around the globe since the start of 2020. With that being said as the number of cases increased we saw that a lot of people suffered due to healthcare not being provided at the right time.SNSs such as Twitter and Facebook can be considered as a quick detection and monitoring tool for COVID-19 as nowadays, people regularly use them to upload images and videos and update their current status specifically during pandemic in a region..Our project proposes to detect these essential requirements in a particular region based on the tweets written by the people.

2.4	**DermaGenics - Early detection and recommendation for treatment of melanoma**

Group Members: Juhi Chhatlani, Tejas Mahajan, Advait Bansode, Rushabh Rijhwani

Mentor: Dr. Mrs.Gresha Bhatia

Abstract: Skin cancer has become one of the most serious kinds of cancer for people in recent years. Melanoma, basal cell carcinoma, and squamous cell carcinoma are all kinds of skin cancer, with melanoma being the most unexpected. Melanoma can be cured if detected in its early stages. Computer vision can be useful in medical imaging and has already been shown in a number of systems. This study calculates how to identify melanoma skin cancer using machine learning and technological tools. A skin lesion image is sent into the system, which is then examined using novel image processing algorithms to infer the existence of skin cancer. By segmenting the picture and assessing the texture, size, and form of the tumor, the lesion image analysis tool checks for the existence of melanoma (a kind of skin cancer). The picture is classified as a malignant lesion of normal skin or melanoma using the derived feature characteristics. In a nutshell, DermaGenics is a web application integrated with the Detectron model that allows users to input stain's photos. The model takes care of it and evaluates if the stain is cancerous or benign.

2.5	**Legal Document Analysis**

Group Members: Khushi Uday Singh Chouhan, Nikita Pradeep Kumar Jha, Roshni Sanjay Jha, Shaikh Insha Kamaluddin

Mentor: Mrs.Sujata Khedkar

Abstract: Text preprocessing is the most essential and foremost step for any Machine Learning model. The raw data needs to be cleaned and pre-processed to get better performance. It is the method to clean the data and makes it ready to feed the data to the model. Text classification is the heart of many

software systems that involve text documents processing. The purpose of text classification is to classify the text documents automatically into two or many defined categories. In this paper ,various preprocessing and classification approaches are used such as NLP, Machine Learning, etc from patent documents.

2.6	**Visual NLP**

Group Members: Jai Malani, Kusum Rohra, Khushboo Dalwani, Khushboo Dhingra

Mentor: Mrs.Sujata Khedkar

Abstract: This project aims to convert the handwritten documents to the computer text format. As there are many government/bank documents which are currently handwritten and which is difficult to maintain, and text files are easy to store, transport and maintain, our system will make the existing system to a digital system

2.7	**VesBot: One Stop Solution**

Group Members: Laveena Shewkani, Mohit Lalwani, Gunjan Lalwani, Chirag Matai

Mentor: Mrs. Rohini Temkar

Abstract: A Chatbot aims to make a conversation between both human and machine. The ultimate goal of a chatbot is to create interaction between a machine and humans. The machine has embedded knowledge to identify the sentences and make a decision itself as response to answer a question. Chat-bots will be primarily based on a text consumer interface, allowing the user to type their questions and receive answers in text as well voice. Chat-bots are usually stateful services,remembering previous commands in order to offer functionality. It can be safely used by even more audiences when chat-bots technology is integrated with popular web services. This proposed system is basically a chatbot for college students and people willing to get information about the college. The User can ask the question about any college-related activities through the chat-bot without physically being available to the college for inquiry. The System reads and analyzes the user's question and then provides answers to the user.

2.8	**Shopping Assistant for Elderly.**

Group Members: Komal Asrani, Sakshi gangwani, Nikita ahuja, Harsh khairajani

Mentor: Mrs. Geocey Shejy

Abstract: There has been an extraordinary growth all around the world regarding android applications. People from every age group are using an android application for some reason or the other. The Internet and applications have become a huge thing now. Companies have realized its potential and that it can

reach the concerned consumers of any business. One of the primary reasons for people turning towards technology is that it makes their lives easier.When we talk about shopping, elders usually find it tedious to stand in a queue for hours or find their products around a supermarket. In Addition to that the whole world has been affected by the Covid-19 Pandemic which has made it really tough to venture out and get groceries. So, we have come up with an android application for grocery shopping that can solve all your problems in the current climate.

2.9	**Detection of Breast Cancer using Machine Learning Algorithms**

Group Members: Disha Mehta, Aakash Mohite, Vaishnavi Shinde, Ritika Khatri

Mentor: Mrs.Indu Dokare

Abstract: Breast cancer is an abnormality in the growth of the breast and is one of the most common diseases found in women.The prompt diagnosis of any disease is very important to avoid further complications. Machine learning and deep learning algorithms play a vital role in diagnosis of disease like cancer. In order to detect breast cancer we developed a system in which the value of the breast cells from the report can be entered and the immediate response is obtained. This application gives a response about whether the cell is malignant or benign. This work is carried out on the Breast Cancer Wisconsin (Original) data set obtained from UCI repository. We have investigated five classification algorithms which include logistic regression, decision tree, random forest, KNN, and Naive Bayes for detection purposes. Among all these algorithms, the decision tree performs well obtaining the classification accuracy of 95.90%. Further, different feature extraction techniques can be employed to make the model more robust.

2.10	**Water Quality Index Analysis and Prediction**

Group Members: Shubham Zope, Prithvi Kumar, Anurag Saraswat, Ashwin Kurup

Mentor: Mrs.Priya R.L

Abstract: Over the past few decades, the water quality of rivers has been threatened by pollutants. Especially in developing countries like India, water quality is a pressing issue. Pollution is a major problem in India as around 70% of its surface water resources are contaminated. The aim of this study is to create a web based application that provides a quantitative prediction model of Water Quality Index (WQI) for Indian rivers, allows data visualization on WQI, heatmap generation for various states of the country with respect to WQI. Such data visualization and its outputs are represented in the form of line graphs and are extended based on WQI prediction model for next 10 years using Lasso regression algorithm. When considering river name and year as input variables, Lasso Regression achieved an R2 score in the range of 0.6 to 0.8.Additionally, a heatmap of India showcases the average state-wise WQI. The goal of this system is to visualize the issues with WQI of Indian Rivers, and thereby increase awareness among citizens and notify the concerned authorities to take necessary action.

2.11	**Sign Language Detection System**

Group Members: Dhruvisha Mondhe, Rutuja Patil, Vaishavi Jadhav, Priyal Agarwal

Mentor: Mrs Lifna.C.S

Abstract: The deaf population in the world lies between 1.8 million to 7 million, whereas there are just 250 certified sign language interpreters.The deaf and mute people are forced to learn techniques like lip reading and such in order to understand the normal community. This inevitably gives rise to a huge communication gap between the deaf and mute community and the normal population. Thus, through our system we aim to help bridge this huge gap and hence we have created an application for the real time recognition of sign language that will help ease the communication between the two groups of people.

2.12	**ShoppersTime: Shopping made easy**

Group Members: Abinash Behera, Nihar Hemant Kumar Kenny, Dhiren Ganwani, Soham V. Ambre

Mentor: Mrs.AbhaTewari

Abstract: To buy a product online, a user visits different websites and compares prices of the product manually which is a time consuming and tedious process. This website, ShoppersTime- price comparison website automates this process of price comparison. The aim of this website is to enhance the experience of online shopping by automating price comparison. Thus, a robust website has been created to save the user's time and efforts while shopping online.

2.13	**A System to detect Brain Anomaly**

Group Members: Karan Sharma, Abhishek Milind Patwardhan, Dhruv Ahir, Siddhi Amar Bhosale

Mentor: Mrs.AbhaTewari

Abstract:In a number of medical diagnostic applications, automated anomaly identification in medical imaging has become a popular topic. Automated tumor diagnosis in MRI is critical because it offers information about aberrant tissues, which is essential for treatment planning. Human inspection is the traditional approach for detecting defects in magnetic resonance brain imaging. Due to the vast volume of data, this strategy is impractical. As a result, to reduce the rate of human fatality, reliable and automatic classification techniques are required. As a result, automated tumor detection approaches are being developed in order to reduce radiologist time while also ensuring a high level of accuracy. Because of the complexity and variety of abnormalities, MRI brain tumor identification is a difficult undertaking. We propose machine learning algorithms to overcome the limitations of classical classifiers in this project, where tumors are diagnosed in brain MRI using machine learning algorithms.

MRI may be used to detect cancer cells in the brain using machine learning and image classifiers. We used Logistic regression and Support Vector Machine (SVM) algorithms to train our machine learning model. We used Flask-SQLAlchemy for databases and HTML CSS for front end development. The website offers the user to register and login to create their respective profiles and then upload their MRI scans for detecting brain tumors.The website gives very close to accurate results for Pituitary and Meningioma tumors.

2.14	**Loan Prediction System**

Group Members: Piyush Kataria, Jitesh Ladhani, Palash Mandhan

Mentor: Mr. Sanjay M

Abstract: In the banking system, banks have many products to sell but the main source of income of any bank is on its credit line. So they can earn from the interest of those loans. A bank's profit or a loss depends to a large extent on loans i.e. whether the customers are paying back the loan or defaulting. By predicting the loan defaulters, the bank can reduce its Non-performing Assets. This makes the study of this phenomenon very important. Previous research in this era has shown that there are so many methods to study the problem of controlling loan default. But as the right predictions are very important for the maximization of profits, it is essential to study the nature of the different methods and their comparison. A very important approach in predictive analytics is used to study the problem of predicting loan defaulters (i) Collection of Data, (ii) Data Cleaning and (iii) Performance Evaluation. Experimental tests found that the Naïve Bayes model has better performance than other models in terms of loan forecasting.

2.15	**Disease Prediction using chatbot**

Group Members: Rashmi Singh, Asmita Bhangare, Hrithika Singh, Shubhangi Zope

Mentor: Mrs.Pallavi Saindane

Abstract: The requirement for health care facilities increased during the pandemic. Our country is extremely populated and is not following the WHO norm of one doctor per a thousand population. This led us to the idea of building a Disease Prediction System using Chatbot. We have created a website with which we have integrated a chatbot that predicts the disease the user is suffering from along with additional information and doctor recommendation for treatment. Any user, hospital, or pathology lab which registers in our system can first log in and then avail of all the facilities of our system. The user can also book appointments with the doctor through his/her account and will have online video call with the doctor. This way, the disease will be predicted ahead of time and thus can save a million lives.

2.16	**Click-Through Rate Prediction Using ML**

Group Members: Chirag Lundwani, Mayur Jaisinghani, Orijeet Mukherjee, Neeharika Nagori	
Mentor: Mrs. Prerna S	

Abstract:
Online advertising is a huge part of the revenue for any company and one of the main factors to maximize it, is predicting the CTR of the ad. Click Through Rate prediction helps to understand the performance of a particular advertisement with respect to a particular user, multiple users or even an entire area. This project focuses on doing a comparative study of 4 algorithms for CTR prediction and finding the best algorithm with least log loss and highest accuracy.

3	**Internet of Things & Robotics**
3.1	**Customer Churn Prediction (CCP)**

Group Members: Kirti Valechha,Aman Kachru,Aman Kachru,Bhavesh Meghwani

Mentor: Mrs. Pallavi G

Abstract: The customer churn prediction (CCP) is one of the challenging problems in the telecom industry. With the advancement in the field of machine learning and artificial intelligence, the possibilities to predict customer churn has increased significantly. Our proposed methodology consists of six phases. In the first two phases, data pre-processing and feature analysis is performed. In the third phase, feature selection is taken into consideration using the gravitational search algorithm. Next, the data has been split into two parts: train and test set in the ratio of 80% and 20% respectively. In the prediction process, most popular predictive models have been applied, namely, logistic regression, naive bayes, support vector machine, random forest, decision trees, etc. on train set as well as boosting and ensemble techniques are applied to see the effect on accuracy of models. In addition, K-fold cross validation has been used over train sets for hyperparameter tuning and to prevent overfitting of models. Finally, the obtained results on test set have been evaluated using confusion matrix and AUC curve

3.2.	**Range Prediction Of Electric Vehicles And Locating Charging Stations Along The Route**

Group Members: Atharva Kathane,Amol Mali,Manthan Pawar,Yash Ahuja

Mentor: Mrs. Rohini Temkar

Abstract: Electrify is a software application which helps to book slots in an electric charging station. While on a road trip, with our application users can book slots on electric charging stations beforehand. Once you enter your start point & destination & click on search icon, the software will show all the available charging stations on the route. You can select the station of your choice. Afterwards, preferable time slots can be selected and online payment can be done.Thus,this system will overcome the major drawbacks of EVs and save time while on a road trip.

4	Image Processing
4.1	**Paddy: To detect and prevent paddy crop disease**

Group Members: Rounak Talreja,Prium Rohera,Varsha Jawrani,Bhajan Watwani

Mentor: Mrs.Sharmila Sengupta

Abstract: Agriculture is a significant part of India's economy being one of the main sources of living. Paddy plant is one of the most important food crops of India covering about one-fourth of the total cropped area. Although having the potential in the market, India's lower paddy crop productivity/hector and higher cost of production is a major concern for farmers. The low yield can be addressed by designing a system that helps farmers identify and predict diseases in the paddy crops. There are so many types of paddy diseases. It is very difficult to manually identify appropriate properties for distinguishing different types of crop diseases. So an android app will help farmers to identify and detect a paddy plant disease and provide preventive measures using images of the disease-infected paddy crop based on machine learning image processing techniques.

4.2.	**Sign Language Recognition System**

Group Members: Dheeraj C. Yadav,Laksh Lalwani,Naman Tahilyani,Shubham Goswami

Mentor: Mrs. Rupali Hande

Abstract: Over the period of time we humans have developed different modes of communication through which we share and express information. Normal hearing people use speech to communicate whereas for deaf people, Sign language is the primary mode of communication by using hand signs & gestures. We aim to bridge the communication gap between normal & hearing imapred person by designing a system for sign language recognition. We have designed a Vision Based Model which takes the sign's input from the camera, processes it, matches it with the dataset & gives the output in text format. We are using CNN algorithm to execute the model. At this age, where technology is prominent, it should play an essential role to help these people communicate smoothly.

4.3	**Identifying Foliar diseases in Tomato Plants**

Group Members: Akhil Chakkungal,Riya Shukla,Samita Kanojia,Palak Garg

Mentor: Mrs Lifna.C.S

Abstract: Agriculture is one of the most important and crucial parts of our society. Not only does it help in providing food but also contributes to the economic growth of the country.In India, Over 70 per cent of the rural households depend on agriculture. According to research, the estimated potential yield losses caused by plant pathogens is up to 16% globally. Yield losses caused by a certain disease

depend not only on disease severity, but also on the weather factors, the pathogen's aggressiveness, and the ability of the crop to compensate for reduced photosynthetic area. However, if the diseases were diagnosed and treated at an early stage, a large portion of the yield loss could be prevented. Thus our main aim would be to reduce the loss of yield due to plant pathogens. Nowadays, image processing and deep learning, powerful and widely used tools, can be used in plant disease prediction. Thus using deep learning concepts with image processing it will be easy for us to recognize whether a crop is infected or not, classify disease according to various issues and with the help of colors developed due to disease and thus suggesting various remedies for it.

Thus the research focuses on collecting the data of diseases on plants and training a model for disease detection. Recent advanced technology has made the use of deep convolutional networks which helps in recognition, classification and also smart phone based size and color detection of leaves on plants for detection of disease. The scope of the project has been limited to tomato plants to develop a disease detection model, more crops could be added later to create a more generic plant disease detection system.

4.4	**Skin Lesion Detector using Dermoscopic Images**

Group Members: Sourabh Bera,Adarsh Singh,Pranav Chaturvedi,Pranav Gadhave

Mentor: Mrs Lifna.C.S

Abstract: There are various types of skin lesions which are highly indistinguishable by naked eyes but some may be malignant others may be benign. Early and rapid determination of these lesions enables dermatologists to treat the sufferers and save their lives. The paper discusses a solution for this problem using Deep Learning Algorithms and deploys it on a web application. The users of the system need to upload a dermoscopic image of the affected area and the CNN model will return whether the image is benign or malignant and also will tell the user the severity based on further classification. The surface layer classification model of whether the image is benign or malignant is trained using ISIC 2020 DATASET and the further classification model which tells about the severity is trained using ISIC 2019 DATASET . After various empirical studies, DenseNet121 architecture proved out to be best giving the accuracy of about 89.2% on binary classification and ResNet50 architecture gave the best results when it came to the multiclass classification with the accuracy of about 93.87%. Both of these models are deployed onto the website for automated real time usage.

4.5	**Image Outpainting**

Group Members: Aashish Nair,Akash Sonare,Jay Deshmukh,Tarun Mishra

Mentor: Mr. Richard Joseph

Abstract: With advancements in AI technology, machines can perform or even mimic tasks that we humans can do. One of its achievements can be seen in image generation, one of it being Image Inpainting (completion).In Image Inpainting, we use AI to complete missing data in an image. This is

an extensive field of research, but its contemporary field, i.e. image outpainting, is not a well-researched one. In Image Outpainting (extrapolation) we try to extend the image beyond its borders. This is similar to our brain picturing the whole image of an object that we partially see through a gap. This task can be achieved by using Generative Adversarial Networks (GANs). Compared to Inpainting, the biggest challenge is to achieve spatial correlation between the generated image and the ground truth image. Also, the process of overcoming this challenge is also sometimes affected because of the training instability of GAN. With the help of Wasserstein GAN (WGAN), the above issue can be solved. So, we propose a model based on the Wasserstein GAN with Gradient Penalty (WGAN-GP) algorithm and deep convolutional neural networks for image outpainting using a dataset on natural images. From this proposed model we found out that the results of the WGAN-GP algorithm was better than the GAN algorithm in various aspects.

4.6.	**Detection of Covid-19 using Chest X-Rays**

Group Members: Nirmiti Sali,Srushti Biwalkar,Nimisha Khadilkar,Amisha Swamy

Mentor: Mrs. Nusrat Ansari

Abstract: One of the critical factors behind the rapid spread of COVID-19 pandemic is a lengthy clinical testing time. The imaging tool, such as Chest X-ray , can speed up the identification process. Therefore, our objective is to develop a CNN Model for the detection of COVID-19 samples from healthy and pneumonia cases using Chest X-Ray images.

5	**Networking & Security**
5.1	**Healthify (Telemedicine Services)**

Group Members: Madhav Bhutada,Vishesh Sachdev,Varad Joshi,Bhavishya Khanchandani

Mentor: Mr.Richard Joseph

Abstract: The Project Healthify is a program designed to address health holistically offering preventive and promotive healthcare accessible to all Indian citizens. Healthify aims to work in digital health care. The basic ideology of our project is to reach the rural-urban population of India through telemedicine development. It focusses to covering long distances with safe and effective medical facilities by doctor consultation and other services at their own convenience. Several diseases and health related problems are required to be either treated digitally (via online appointments and treatments by recognized doctors) or physically (via online consultation followed by physical examination). For cases like Pathological tests, Vaccination or other health tests, it is needed to visit one of the Clinics / Hospitals nearby, the information of which will be readily available in the physical consultation of the app. Whereas, certain problems related to Orthopedic, Skin, Pediatric etc., will be treated through digital consultations.

5.2	**Votechain: A Decentralized Voting System**

Group Members: Payal Kukreja,Payal Mangtani,Sakshi Ailsinghani ,Kumodh Kukreja

Mentor: Mrs. Veena Trivedi

Abstract:.The computer security field has for a decade studied the possibilities of electronic voting systems, with the goal of minimizing the cost of having a national election, while fulfilling and increasing the security conditions of an election. The main objective of this project is to build an online voting system which will limit voting frauds. Expanding e-voting into Blockchain technology could be the solution to alleviate the present concern in the e -voting. This E-voting system has the potential to make the voting process easier and more accessible for electors.

5.3	**DOT HAZMAT (Detection Of Threat: Hazardous Materials)**

Group Members: Mihir Pamnani,Kaushal Jagasia,Sohan Walawalkar,Tejas Gala

Mentor: Mrs. Rupali Hande

Abstract: With the evolution of artificial intelligence and deep learning techniques along with widespread development in computer vision, many fields have experienced an improvement in resolving their problems with high efficiency. One such field to benefit is sign detection of Hazardous Materials (HAZMAT) for rescue operations in dangerous scenarios. Accurate detection and interpretation of HAZMAT signs has always been a primary challenge in rescue operations. In these cases, the detector has to not only detect the HAZMAT sign which has a unique symbol with a specific meaning but they also have to address various secondary issues like image distortion and limited CPU and computational resources on site. The signs are globally accepted and all are language-independent. In an attempt to resolve the above commonplace problem, In this research, we propose a YOLO-CNN pipeline-based Android application called DOT-HAZMAT (Detection of Threat: Hazardous Materials) for on-site real-time HAZMAT sign detection and recognition along with text detection for utmost accuracy.

5.4	**Bitcoin Prediction using Machine Learning**

Group Members: Sakshi Talreja,Anand Tekwani,Riya Ranglani,Niyanti Padave

Mentor: Mrs.Pallavi Saindane

Abstract:Bitcoin is a decentralized digital currency, without a central bank or single administrator, that can be sent from user to user on the peer-to-peer bitcoin network without the need for intermediaries. Bitcoin has attracted extensive attention from investors, researchers, regulators, and the media. A well-known feature is that Bitcoin's price often fluctuates significantly.The project is for predicting the cost of Cryptocurrencies as the price predictability of the cryptocurrencies are analyzed at the daily level frequencies using the machine learning classification algorithms. Furthermore, we

predict Bitcoin price parameters using which it can be further used in a real trading environment by investors.

6	**Cloud Computing**
6.1.	**E-kart (E-commerce website)**

Group Members: Anisha Dhameja,Karan Rohra,Khushboo Baja**j**

Mentor: Mrs. Sunita Suralkar

Abstract: The drivers for electronic trade are both mechanical (under the colossal strain of advancement) and business situated. Electronic Commerce is the method involved with carrying on with work through PC organizations. An individual sitting on his seat before a PC can get to every one of the offices of the Internet to trade the items. Dissimilar to conventional trade that is completed genuinely with the work of an individual to go and get items, online business has made it simpler for people to decrease actual work and to save time. Internet business (Ecommerce) which was begun in the mid-1990's has taken an extraordinary jump in the realm of PCs, yet the way that has blocked the development of internet business is security. Security is the test confronting web-based business today and there is still a great deal of progression made in the field of safety. The primary benefit of web-based business over customary trade is the client can peruse online shops, look at costs and request stock sitting at home on their PC. For expanding the utilization of online business in agricultural nations, B2B web based business is carried out for further developing admittance to worldwide business sectors for firms in non-industrial nations. For a non-industrial nation progression in the field of online business is fundamental. The exploration procedure shows the significance of online business in agricultural nations for business applications. Embracing e-business is presently not an upper hand, yet a typical business process,without which a venture is probably not going to make due in the New economy.

6.2.	**Forecasting of Carbon Emission due to Meat Industry**

Group Members: Parth Paresh Wadke ,Chirag Lundwani,Divesh Vijay Watwani,Prithviraj Chavan

Mentor: Mrs. Manisha Mathur

Abstract: All living and non conscious things are a section of the scheme because of a rise within the range of vehicles, rapid population growth and industrialisation over the years, the carbon content within the atmosphere has risen at an associate degree exponential rate.Transportation, Industrialization and technological growth are beneficial to the modern world but are major concerns generating carbon footprint. Livestock and meat industry is a sector which is always overlooked when talking about carbon footprint. The Meat industry is considered to be generating over 14.50% of global carbon footprint.The objective of our project is to analyze carbon emission due to livestock and meat and develop a prediction model which will give us accurate predictions for the next coming years. These predictions will be visualized in different types of charts and graphs which will help the end user to refer to the predictions efficiently.

6.3	**Secured Repository of Health Reports**
Group Members: Vipin Talreja,Kaustubh Keny,Yash Lakhani	
Mentor: Mr.Prashant Kanade	
Abstract: The COVID pandemic has affected the world in many adversarial ways throughout the past two years. One of them was the problem of patients being unable to diagnose and communicate with their doctors due to pandemic restrictions.To bridge this miscommunication between the doctors and patients, we proposed a centralized health reports repository system, which allows patient(s) to upload, add their medical report(s) and the doctor(s) being able to diagnose them.	

7	**Application Design & Product Development**
7.1	**Amigo: My virtual friend**
Group Members: Jahnavi Mulchandani,Shruti Koku,Aryan Gupta,Ruchika Dusija	
Mentor:Mrs.Mannat Doultani	
Abstract: A web application to record daily whereabouts of the user via e-diary entry through text and/or speech and provide them with an instant result of their mood/emotional state by performing sentiment analysis on the entry. Users can track the changes happening in their mood/emotional state over a period of time (weekly, monthly, etc.). On the basis of the analysis, the user will be suggested methods to relax (if required) and will be presented with a reassuring message at the end of the day. If the user records a constant negative mental state, they can be suggested to connect with a mental health professional to help improve their mental wellbeing.	

7.2	**Smart Colony System**
Group Members: Meet Patel,Yogesh Khatri,Soham Das,Rohan Ghume	
Mentor: Mr.Prashant Kanade	
Abstract: Since the increase in urbanization, people in this unsettling world need temporary homes for renting. So our Smart Colony System provides the following : Helps users in finding the perfect rental home or property in the township within the best and suitable price. It also manages all the rental systems of that township in a computerized system. Our platform also provides the most household services to the residents of the township to get the domestic work done by the skilled worker within a single click.	

7.3	**Curriculum Based System**

Group Members: Kunal Godhwani,Chirag Parchani,Gulam Mohammad Ali,Piyush Nihalani

Mentor: Dr. Dashrath Mane

Abstract:.The struggle of a regular student has been increasing due to more and more study materials and different kinds of courses. A student visits more than enough websites to collect study materials and other related contents such as Syllabus, Online Courses, etc..So, we have come up with a website where students get everything such as Syllabus of a particular subject, Study material, Skill-based course links, recommendations of Courses, Event Updates conducted by councils, Informative Blogs by other students and many more.

7.4	**Konark Dossiers**

Group Members:Aryan Bedi,Kartik Nagdev,Rohit Manghani,Pratik Aswani

Mentor: Mrs.Mannat Doultani

Abstract:A Web Application that will help to recharge, customize and buy new packs from konark dossiers.

7.5	**BOOK IT Find pre-owned books**

Group Members:Manish Khilwani,Vijay Begwani,InderpalSingh Ramani,Paarth Kulkarni

Mentor: Mrs. Pallavi G

Abstract: As a fresher it is difficult for college students to decide which second hand books they have to buy and from where should they buy? We have found a one stop solution for students' problems - BOOK IT. It is an e-commerce website which helps college students to buy used books from their seniors and to sell their own books to their juniors.

7.6	**Recipe-Find new recipes according to your diet!**

Group Members: Lavina Virwani,Girish Khemchandani,Neha Vaswani,Bhavesh Janyani

Mentor: Mrs. Sunita Suralkar

Abstract:In the whole world, the major attraction point of people is food.People like to cook food of different national cuisines, ethnic cuisines etc. They are eager to taste and to know which authentic

ingredients are used to make the same. Many of them opt to know the procedure of making those recipes. Most of the time people don't get proper details of recipes and could not try making them. In the proposed system, people will have detailed information of a variety of recipes at a go! The idea allows users to view recipes for various dishes with details including from ingredients to amount of calories in it. Every user can search for recipes according to their choice. By combining the title search and category-wise filtering, the idea makes finding recipes easy. This idea is time saver and handy to provide recipes within a few clicks

7.7	**Fast N' Fresh**

Group Members:Dhiraj Taneja,Karan Punjabi,Bharat Uttamchandani

Mentor: Mrs. Sujata Khandaskar

Abstract: An E-commerce Website where users can buy the grocery products online with the help of local vendors. The Customer can also Sign in the accounts where his credentials along with his previous Orders are also being Stored.

7.8	**StockDotinfo**

Group Members: Hitesh Ahuja,Kunal Wadhwani,Harsh Lulla,Saurabh Lalwani

Mentor: Mrs. Sujata Khandaskar

Abstract: A website that helps stock investors to get the company's past performance and a place where they can track the company's current share price in the market.
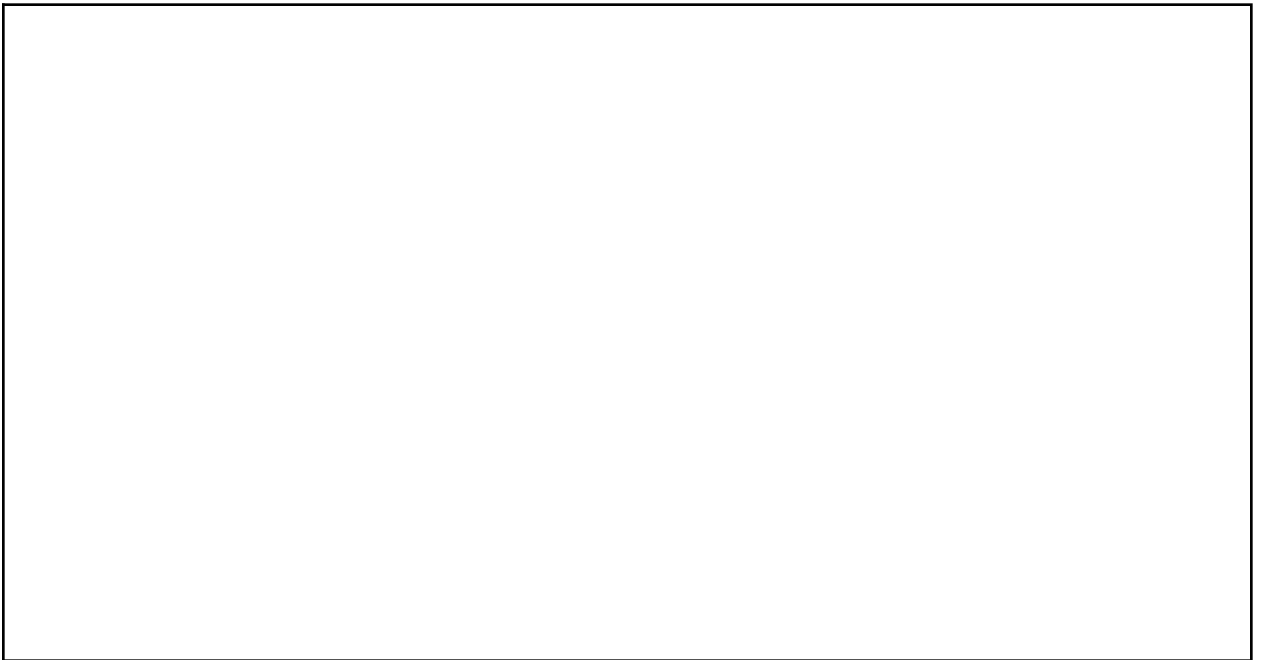
7.9	**Learning Management System**

Group Members: Yash Jawale,Harsh Bhat,Hrithika Singh,Hrithika Singh

Mentor: Mrs.Pallavi Saindane

Abstract:.E-Learning Management System is a project which aims in developing an online application to provide Online Education, maintain Study Materials, keep Student records and collect Payments. This project has login features, Educator, Admin and Student as an user can login into their own portal separately. This System can be used to search for course,add new courses, edit courses, check payment status etc. The User can login into his account to follow the course he purchased and can share his/her feedback.Overall this project of ours is being developed to help the Educator as well as Students to provide a Teaching-Learning platform in the best way possible.

7.10	**Online Doctor Appointment Booking System**

Group Members: Dipti Menghani ,Gaytri Aasija,Hema Gallani ,Venkatesh Rallapalli

Mentor: Dr. Dashrath Mane

Abstract: Nowadays many people are facing different types of medical problems. The pandemic has not only brought the COVID-19 virus, but also many major and minor diseases as well. Due to the lockdowns, booking doctor appointments physically has become almost impossible. Also, most people don't know who the best doctor they can go to and they don't have direct contact with the doctor to consult about their health problems. Efficiency and patient satisfaction are desired optimal performance but the outpatient of most clinics in developing countries are faced with plethora of issues.Keeping in mind these issues, a web- based doctor appointment system has been developed. In this the admin (receptionist) allows registration and login for both doctors and patients.

Doctors can register by giving necessary details like Name, Qualifications, Specializations, Work History etc. After successful registration, the doctor can log in by giving their username and password. The doctor can see the patient request and sends the notification to the patients if the appointment is available. They can prescribe medicines after consultation and also view the feedback given by the patient. The patient must also be a registered user and they can select the particular doctor they want to book an appointment with. This system focuses on improving the efficiency and quality of delivering a web-based appointment system.

7.11	**Shiksha: A career guide**

Group Members: Laveena Kithani,Disha Raghani,Chirag Dayaramani,Yash Kriplani

Mentor: Mrs.Mannat Doultani

Abstract: A Career Guidance System, Shiksha : A career guide where students can see various career opportunities ,the system shows various fields available after 10th ,12th. It also lists various colleges available where students can search colleges by their courses. Next the system allows users to give a test. It is actually a series of tests of various general questions. After test completion a score is calculated for each test. Based on those results the system manipulates and calculates the best career for that user.

S.E. PROJECTS

III	S.E. MiniProjects
1.	**AI, Deep Learning and Data Warehousing & Mining**
1.1.	Wealthy Kids India
Goal	**8** Decent Work and Economic Growth
Group Members: Gayatri Talreja, Ritika Raina, Sonal Belani, Tanishq Harchandani	
Mentor: Dr. Prashant kanade	
Abstract: Wealthy kids india aims to provide information on different investment schemes. Parents can plan investments for their kids.Various schemes that usually help in financial wellbeing for kids.Financial stability is a must for future needs and requirements at the right age. The solution is accessible from the browser, is accessible from the browser and is simplistic in its design and uncomplicated in its functionality.	

1.2.	**Health Awareness App for Diabetic Patient in Rural India**
Goal	3 Good Health and Well-Being

Group Members: Harsh Loya, Viraj Joshi, Varun Chawla, Harsh Patil

Mentor: Prof. Priya RL

Abstract: In our mini project our aim is to create awareness about diabetes among the people of rural India. As the number of patients with diabetes are increasing day by day in our country. The reason behind this sudden increase in patients is the adaptation of unhealthy lifestyles .So in order to solve this problem our application provides various activities to the users which helps to cure the disease. Also our application helps the user to monitor his sugar level. The technologies used in order to make our application are Android Studio (To make GUI of application) & My SQL (To create Database) which is required for our application. Thus our application helps the user to keep his or her diabetes in control.

1.3	**e-Guidance portal**
Goal	**4** Quality Education

Group Members: Prathamesh Shripad Thakur, Shreyas Arun Sawant, Hariharan Krishnan Iyer, Anurag Pravin Ghatge

Mentor: Prof. Abha Tewari

Abstract: Offline counseling is not readily available everywhere, which makes it much less accessible, putting a strain on both time as well as money. Also, a tight schedule needs to be followed which further makes it difficult to have all the questions answered. This shows that there is a need for this activity to adapt to the current technology, which can make it reach a wider audience. Following this, we also aim to create an e-guidance portal which will help students make the correct decisions for a bright career.

1.4.	**A gaming guide for Autistic and Deaf Kids**
Goal	4 Quality Education

Group Members: Ketaki Jambhekar, Gaurav Ambartani, Shalini Mirani, Jatin Ochani

Mentor: Mr. Richard Joseph

Abstract: Gaming Guide for Deaf and Autistic Kids is a mobile application that has been made for Visual, Physiological and Overall Development for Deaf and Autistic Kids. The App is also developed to spread awareness in the society and to let a special needs child enjoy simple daily activities without being bullied or discriminated against. The App focuses on repetitive daily tasks performed by the user to help them with real world problems and gives daily results. This project presents an efficient approach for storing data and using them for helping the society.

II	Data Analytics and Machine Learning
2.1	Personal Smart Nutritionist
Goal	3 Good Health and Well-Being

Group Members: Isha Hemant Desai ,Shrey Panchamia, Mohit Shahdadpuri,Gauri Nagral

Mentor: Mrs. Geocey Shejy

Abstract: Our project is focused on tracking dietary habits, classifying various Indian food items based on their nutritional value. It generates appropriate suggestions for the user based on his/her requirements.

2.2	CVS Anaylzer
Goal	3 Good Health and Well-Being

Group Members: Aaryan Manawat, Nikhil Ram Haswani,Hitesh amrakhyani, Devanand ,Abhiman Singh

Mentor: Mrs. Geocey Shejy

Abstract: Our project identifies CVS (Computer Vision Syndrome) amongst people with high amounts of screen time on a day to day basis like software engineers and recommending treatments and cures to prevent CVS.

2.3	COVID'19 Data Analysis
Goal	3 Good Health and Well-Being

 Group Members: Nikkita Gurnani ,Namrata Avhad,Roshini Panjwani,Sakshi Shadadpuri

Mentor: Mrs. Indu Dokare

Abstract: CORONA VIRUS was declared as pandemic in march 2020.With lakhs and millions of people getting affected due to this pandemic every single day it is very difficult to keep a record of affected citizens in offline manner so a website will really be helpful to provide detailed information of affected, recovered and mortal ones. Also giving detailed information on vaccines available and keeping a record of citizens getting vaccinated is provided by the website. Detailed and complete analysis of state wise cases and vaccination is done by our website in a statistical manner.

2.4-	Read to Right
Goal	**4** Quality Education
Group Members: Vinit Patil, Chirag Panjwani, Prerna Bajaj,Deanna Fernandez	
Mentor: Dr. Sujata Khedkar	
Abstract: To design and develop the website to measure the fluency of the student in reading English language text. The application will display the different reading passages as per the level of the student. Progress monitoring and auto grading of the student will be stored in the student profile. This webapp can be used by school teachers to train and evaluate the primary to secondary level students	
2.5	Question Generator from Text Document
Goal	**4** Quality Education
Group Members: Gautam Wadhwani, Neeraj Chawla, Tanmay Thakare,Yash Kewlani	
Mentor: Dr. Sujata Khedkar	
Abstract: Question is an essential tool to assess the learning of a student. It helps the teacher to test the student's knowledge. However searching and framing questions manually is a job which requires lots of work, time and patience. The objective of our project is to automatically generate meaningful Multiple Choice questions with appropriate choices on a given text document.	
2.6	Placement Prediction using Machine Learning
Goal	**8** Decent Work and Economic Growth
Group Members: Sahil Santosh Salunkhe, Nimish Chidrawar,Gautam Dinga,Kaustubha Sahu	
Mentor: Dr. Mrs. Rohini Temkar	
Abstract: The campus placement activity is incredibly vital from an institution point of view as well as student point of view. In this regard to improve the student's performance, a work has been analyzed and predicted using the classification algorithms to validate the approaches. The algorithms are applied on the data set and attributes used to build the model. The final algorithm will be applied to the system based on the accuracy obtained.	
2.7	Automatic Timetable Generator
Goal	**9** Industry Innovation and Infrastructure
Group Members: Gunjan Chhaproo, Sagar Kishnani, Mohit Gangwani, Reshoo Nehru	
Mentor: Mr. Richard Joseph	

Abstract: Most colleges have a number of different courses and each course has a number of subjects. Now there are limited faculties, each faculty teaching more than one subject. So now the time table needed to schedule the faculty at provided time slots in such a way that their timings do not overlap and the time table schedule makes best use of all faculty subject demands.

2.8	**Music Recommender System**
Goal	**9** Industry Innovation and Infrastructure

Group Members: Ritika Vanjarani, Jasmine Dhirwani, Neeta Narang, Diya Janyani

Mentor: Mrs. Nusrat Ansari

Abstract: The number of songs available exceeds the listening capacity of a single individual. People sometimes feel it is difficult to choose from millions of songs. Moreover, music service providers need an efficient way to manage songs and help their customers to discover music by giving quality recommendations. Thus, there is a strong need for a good recommendation system. Our system is able to estimate what artist or group would match user preferences to the user at a given time.

2.9	**Website creation and Social Media Research**
Goal	**9** Industry Innovation and Infrastructure

Group Members: Siyona Singh,Tammana Bathija,Sanjana Bhojwani,Vanshika Thakur

Mentor: Mrs. Veena Trivedi

Abstract: The objective of the project is to analyze depression related tweets and to display the result in a website. As effective treatment of depression requires early detection. Therefore a person can identify the level of depression at the early stages through our website. This can help him/her in dealing with depression.

2.10	**Book Analysis and Recommendation System**
Goal	**9** Industry Innovation and Infrastructure

Group Members: Yash Nilesh Brid, Prem Tarun Chawla, Sahil Rajesh Talreja,Kaplesh Mulchandani

Mentor: Mr. Satish Ranbhise

Abstract: With each passing year, more books are published. We have always considered the magical persona, and the impact books seem to hold, and in this project we analyze what kind of books really interest people into reading. The sole purpose of this project is to provide an in-depth analysis on data related to books and recommend new books to the users based on their choices. So by developing this recommendation system, we group together the books that are similar in some aspects and provide new recommendations to the users.

3	**Product Design & Development**
3.1	App for the elderly
Goal	**3** Good Health and Well-Being

Group Members: Kaushik Sahasranaman, Manasi Shah, Riya Nadagire, Chaitanya Sondur

Mentor: Dr. Sharmila Sengupta

Abstract: The senior community in India faces a lot of challenges in terms of using smart phones browsing through various documents memorizing their health checkups and some are even socially inactive due to family background or environment. It is the need of the hour to provide a single application meeting all the requirements. Through "ONTRACK", we aim to develop a solution for their regular needs. The app integrates various facilities like Medicine Reminders, Schedule Doctor Appointments, Health related suggestions (Diet suggestions/Recipes),Access to E-News, E-Magazines and Recreation/Travel sites, Solutions to minor ailments and Entertainment/Recreation (music, yoga, meditation which would make them feel light and happy as well. We would keep it simple, easy to understand and with lots of helpful features for our senior citizens.

3.2	**Healthy Kids Repository**
Goal	**3** Good Health and Well-Being

Group Members: Om Madat , Figo Cardozo ,Vansh Pahuja, Aayush Shribatho

Mentor: Dr. Prashant Kanade

Abstract: Healthy Kids Repository is a Kids Development Monitoring that keeps track of kids Sleeping, Growing (Height, Weight, Head circumference), Skills and Vaccinations. Parents can provide information about their children using a repository and Doctors can monitor and analyze information for their patients using a Web App. The solution is accessible from the browser and is simplistic in its design. The solution uses HTML, CSS, JavaScript, PHP, SQL and uses a local server on our system known as Xampp to host our webapp.

3.3	**Activity Planner and Reminder**
Goal	**3** Good Health and Well-Being

Group Members: Lalchandani Jessica Shailesh,Lahrani Simran Ravi,Karira Karina Inder,Wadhwani Roshni Gyanchand

Mentor: Mrs. Indu Dokare

Abstract: In this mini project, our main aim is to make people's lives easier. The sustainable goal of our project is to ensure punctuality, better time management and ease in organizing the work. This application will be useful for all age groups. Children and college students can use it to complete their homework, assignments and extracurricular activities on time. Elderly people can set reminders to take their medicines on time. Hence, our application will help working people and home makers to manage their tasks on time. The user can create, edit, and delete the reminders as per requirement. Dynamic notifications will also be given at appropriate times.

3.4	**Website for giving guidance about pet grooming**
Goal	3 Good Health and Well-Being

Group Members: Samarth Gawali, Yask Kaka, Soham Bhole, Tarang Rajpal

Mentor: Prof. Lifna CS

Abstract: The "Website for giving guidance about pet Grooming" will be a web based portal for pet lovers who want to know about how to take care of their pet. Here during this website an individual who wishes to know about and wants information related to pets can visit. The individual can register and login to buy products.

3.5	**Web Portal**
Goal	3 Good Health and Well-Being

Group Members: Yash Narkhede, Dhananjay Pai, Pushkaraj Baradkar, Yash Sahane

Mentor: Mrs. Mannat Doultani

Abstract: The project "E-commerce site for sweets and dry fruits" is a web based application. This website provides a facility for buying and selling sweets and dry fruits. Consumers get to know about the quality of the products they are buying, by presenting them with an idea on how to distinguish between a good and bad quality product. The seller has a special system of admin where he can update, create and delete the items available in the shop's inventory. Furthermore users can view the most buyed products from our website. After buying the consumer gets a machine generated bill along with a confirmation mail for the order. This makes the whole process of buying, selling and managing processes a whole lot easier.

3.6	**Online Medicine Booking Store**
Goal	3 Good Health and Well-Being

Group Members: Abhishek Chhabria,Mithil Wasrani,Ritika Bhat,Harsh Deshmukh

Mentor: Mrs.Yugchhaya Galphat

Abstract: In today's times where it is getting dangerous to go out and get our desired medicines and that too at a cheap price is a difficult task, so here we are introducing 'CAREFIRST', which compares the medicine prices and deals across e-medical stores and delivering at your doorstep.

3.7	**Covid Patient Tracker**
Goal	**3** Good Health and Well-Being

Group Members: Sakshi Rane,Sanjana Asrani,Dimple Madhwani,Divyang Patel

Mentor: Mrs.Yugchhaya Galphat

Abstract: This Project proposes a Covid Patient Tracker website which includes graphical visualization of covid data and a forum for user interaction. The web pages consist of covid-related information and updates , SOP's and a survey form for users to give themselves a self-diagnosis based on their symptoms.

3.8	**Snap Care Health Assistant**
Goal	**3** Good Health and Well-Being

Group Members: Atharva More,Athurva Sawant,Aditi Salvi

Mentor: Mr. Satish Ranbhise

Abstract: Snap Care is a simple and user-friendly application which helps you book appointments with the best suitable specialized Doctors as per your need and also suggest the best suitable hospitals/clinics nearest to your location. This Application also Suggests some home remedies for some lighter problems as well.

3.9	**WEATHERCAST+ (Weather Updates & Forecast Application)**
Goal	**4** Quality Education

Group Members: Hitakrit Goplani,Shruti Dalvi, Swara Nabar,Krish Mehta

Mentor: Dr. Dashrath Mane

Abstract: Weather influences everyone in the world. The objective of our project is to help the general public be updated about the weather conditions in their surroundings either entering the location manually or through GPS.

3.10	**Reader's Hub**
Goal	**4** Quality Education

Group Members: Denzil Nelson,Tanay Phatak, Harsha Chelani, Vidhi Chijwani

Mentor: Dr. Dashrath Mane

Abstract: Reader's Hub is a Library Management System that helps the librarian to manage and maintain the library resources and make them available to the users/readers in a more efficient and hassle-free manner. It also automates features of fine calculation, stock tracking. This is a web-based software which enables users to access the library from anywhere any time.

3.11.	e-Sports Ecosystem
Goal	4 Quality Education

Group Members: Vishakha Kulkarni,Ananya Pandey, Madhura Mhatre,Harsh Rane

Mentor: Prof. Priya RL

Abstract: eSports Ecosystem is an opportunity to take on a series of physical activity challenges and compete with others for fun, certificates and the overall victory in the competition. Gamification is a technique used to insert gameplay elements in non-gaming settings, to enhance user engagement with a product or service. By weaving suitably fun features such as leader boards and badges into an existing system, designers tap users' intrinsic motivations so they enjoy using them more. "Fitness Inc." is an e-sports web application that aims at providing healthcare to heart and diabetic patients through a portal. This app classifies the user according to the age and severity of their present health condition.

3.12	Visualization of polynomial Arithmetic
Goal	4 Quality Education

Group Members: Priotosh Mondal ,Rahul Motwani,Malhar Kajale,Utsav Gavli

Mentor: Prof. Lifna CS

Abstract: The concept of polynomials is fundamental to our understanding of the world through the mathematical lens. Visualization of the complex concepts of polynomial arithmetic operations will aid young learners to grasp the concepts with utmost ease. We aim to create an efficient platform in the form of a webpage to provide the same features and help educators and learners in their learning journey.

3.13.	Chess Engine with AI
Goal	4 Quality Education

Group Members: Mansi Bellani, Siya Doshi, Sudhanshu Sabale, Anishkumar Mahalingam Iyer

Mentor: Prof Abha Tewari

Abstract: The aim of this project is to create a program that can play chess and analyze how it has improved with the different iterations of the engine. To achieve these goal different approaches to chess engines will be explored. These different algorithms will be implemented into Python with the aim of creating a low to mid-level chess engine. The overall outcome of the project is visually pleasant and functional providing the user all the functionality of the chess engine in a clean and easy to use Graphical User Interface..

3.14	**Web-based application for automatic timetable generation**
Goal	4 Quality Education

Group Members: Om Gole, Ayush Jain, Varad Deshmukh, Hrishikesh Patil

Mentor: Ms. Pallavi Gangurde

Abstract: The aim of this project is to create a web - based application for automatic time table generation. The manual time table designing is time consuming and demands considerable effort. An automated time table generator saves time and efforts thus, ensuring that no classes overlap with each other and provides easy access to students and faculties. In addition to that, it reduces error, is secure and user friendly and easy to customize. It makes use of genetic algorithms to overcome every trivial issue with maximum efficiency.

3.15	Visualization of sorting algorithm
Goal	**4 Quality Education**

Group Members: Siddhant Kodolkar,Sachin Choudhary,Harsh Karira,Sahil Ramchandani

Mentor: Mrs. Rupali Hande / Mrs. Priti Joshi

Abstract: Algorithm Visualization which is a form of high level dynamic visualization of software that uses user interface techniques to portray and monitor the computational steps of the algorithms. Moreover algorithm visualization systems are also useful tools in algorithm engineering, particularly at several stages during the design, implementation, analysis tuning, experimental evaluation and presentation of the algorithm process. Algorithms are a captivating use case for visualization. Algorithm Visualization (AV) uses graphics to portray an algorithm's actions. AV holds the promise of helping computer science students understand algorithms more effectively and in more prominent profundity. The purpose of this study is to design a system for sorting algorithm visualization and implement the system.

3.16	An Quiz Application
Goal	4 Quality Education

Group Members: Nikita Narwani,Chitra Atlani,Navin Idnani,Muskan Chhabria

Mentor: Mrs. Nusrat Ansari

Abstract: The "MCQ Quiz Application" has been developed to override the problems prevailing in the practicing manual system. This software is supported to eliminate and in some cases reduce the hardships faced by this existing system.It can assist the user to concentrate on their other activities rather than concentrating on the record keeping. Thus it will help organizations in better utilization of resources.

3.17	Educational Tool and Progress Calculator for kids
Goal	4 Quality Education

Group Members: Vivek Balani,Sakshi Bhojwani ,Prabha Pamula,Yash Pahlani

Mentor: Mrs. Sunita Suralkar

Abstract: E-learning educational system is a learning system based on formalized teaching but with the help of electronic resources.
most importantly it provides an essential opportunity for many pre-primary and kindergarten kids to learn valuable lessons through the medium of online technology. we aim to create a free and fun learning app which would benefit senior Kindergarten kids with their development and growth of their mental skills our objective is to develop an Application which will provide report cards as well as a progress calculator with fun learning activities for different subjects like Math, English and EVS.

3.18	Android - Memory Game Development for Kindergarden
Goal	4 Quality Education

Group Members: Roshni jaisinghani,Sahil Dodeja,Vanshika Makhijani,Divya Makhija

Mentor: Mrs. Pallavi Saindane

Abstract: Memory games help to build cognitive skills that will help for future development. The games are centered on recognizing differences, connecting related images, remembering positions of images etc. the traditional system has been altered and new ideas are developed.

3.19	Contact Book Application
Goal	4 Quality Education

Group Members: Yashraj Mulwani,Chetaniya Bajaj,Piyush Waghmare,Shreya Kukreja	
Mentor: Mrs.Yugchhaya Galphat	
Abstract: :This application is aimed towards making a user friendly desktop version of a contact book/phonebook. This system is developed using the general need required by the user while using the phone directory book. It will simplify the task and reduce paper work. The system is very convenient and it is anticipated that administrators, academics, students, and applicants will easily access functions of the system. This application is directed towards learning and database testing purposes.	

3.20	**Typing Tour**
Goal	**4** Quality Education

Group Members: Omkar Mahajan ,Anish Nair,Chaitanya Limaye,Manav Valecha,Sakshi Sanjaykumar Patil	
Mentor: Mrs.Yugchhaya Galphat	
Abstract: Due to ongoing pandemic and initiatives like Digital India, an increasing number of users have started using electronic devices. Efficient use of electronic devices requires good typing skills. This web app "Typing Tour" aims to teach users ten-finger typing technique. It will teach this technique in a step-by-step manner, starting from beginner to advanced. It also features a typing race where you can test your typing speed and accuracy.	

3.21	**Restaurant Management**
Goal	**8** Decent work and Economic growth

Group Members: Bhargav Mungekar,Aarya Lotke,Aayushi Salunkhe,Niranjan Yeole	
Mentor: Mrs. Sujata Khandaskar	
Abstract: Our project lies in the domain of Product Design and Development. The application will provide automated order placing and menu management functionalities for the restaurant. The customer will search for his/her favorite dishes among various healthy options available from the menu and choose between dine-in and pick-up option.	

3.22	**Blood donation management system**
Goal	**8** Decent work and Economic growth

Group Members: Eshwar Vazirani,Khan Nausheen,Lavesh Lulla,Saif Syed	
Mentor: Mrs.Prerna Solanke	

Abstract: Blood Bank Management System (BBMS) is a browser based system that is designed to store, process, retrieve and analyze information concerned with the administrative and inventory management within a blood bank. This project aims at maintaining all the information pertaining to blood donors, different blood groups available in each blood bank and help them manage in a better way. Aim is to provide transparency in this field, make the process of obtaining blood from a blood bank hassle free and corruption free and make the system of blood bank management effective. Our client is not interested in blood stocking, instead we are stocking blood donors information. The donors who are interested in donating blood have to register in the database. There is no storage of blood so no complications in the project. The software is fully integrated with CRM (customer relationship management) as well as CMS (content management system) solution. It is developed in a manner that is easily manageable, time saving and relieving one from manual work. The requirement of the blood has to be requested and we supply the information of the donor. The donors can update their status whether they are available or not.

3.23	**Online Shopping Store App**
Goal	**8** Decent work and Economic growth

Group Members: Kesar Kishan Jotwani,Jayesh Rajesh Dayalani,Aryan Vishal Motwani,Kapil Bhavnani

Mentor: Mrs. Manisha Mathur

Abstract: Due to prevailing pandemic situation with malls closed and restrictions in going out. more and more people are switching to online shopping from the comfort of their homes.Online shopping is a process whereby consumer directly buys goods,services etc,from a seller without an intermediary service over the internet.Online shopping app consist of different functionalities and features such as proper categorization of the product,trending products,recently searched items etc.that will have clear idea about the product and will have the benefit of choosing product wisely.

3.24	**Online Toy Management System**
Goal	**9** Industry Innovation and Infrastructure

Group Members: Ritesh Tahilramani, Ritika Hotwani, Komal chhutlani, Anish Mangnani

Mentor: Mrs. Vidya S Zope

Abstract: PlayCastle: For The Toys You Have Always Wanted! Toys are a child's best source of entertainment. Many people around the world prefer to shop online. Our main objective is to create a hassle free web based online toy management system where we ensure that there should be minimum time loss for the customer with a huge variety of options and maximum profit. Our system provides toys of various categories for example learning toys, soft toys, pet toys and many more. We have feasible payment options like cod and card payment.

3.25	**Coupons Generation System**
Goal	**9** Industry Innovation and Infrastructure

Group Members: Digvijay Kocharekar,Tanmay Damle,Atharva Mahalle,Raghav Singh

Mentor: Mrs. Prerna Solanke

Abstract: Coupons in today's world have been a crucial aspect in the growth of new startups or even established businesses to attract consumers to their products. Not only new startups but even these coupons help in the introduction of new product lines in the market and encourage their consumers to buy those commodities. The main aim of our project is fairly simple that is as per the name goes 'Coupon Generating System'. We are aiming to distribute coupons to the new startups so they can have a strong impact before getting exposure in the market. This will help them in building their business with a strong start and get connected to their consumers.

3.26	**Handwritten Text recognition using python**
Goal	**9** Industry Innovation and Infrastructure

Group Members: Vedansh Udhawani,Chirag Dodeja,Romesh Lulla,Sunny Satish Bhatia

Mentor: Mr. Sanjay Mirchandani

Abstract: Handwritten Text recognition is the ability of a machine to receive and interpret handwritten input from multiple sources like paper documents, images, touch screen devices etc. Recognition of handwritten and machine characters is an emerging area of research and finds extensive applications in banks, offices and industries. Handwritten Text Recognition using Python that can effectively recognize a Handwritten file by using Pytesseract and openCV-python open source libraries and can convert the handwritten file in .txt, pdf and a voice speech by using gTTS (a Python library) which creates the audio file of text in .mp3 format.

3.27	**Railway Reservation System**
Goal	**11** Sustainable cities and Communities

Group Members: Divesh Mangtani, Tarun Shetty, Varun Salvi , Paraskumar Panchal

Mentor: Mrs. Mannat Doultani

Abstract: In the given project we will be developing a website and an app which will help users to find train details, book tickets and to the desired destination. With the help of online booking people can book their tickets online through the internet, sitting in their home by a single click of mouse.

3.28	**Housing Society Management System**
Goal	**11** Sustainable cities and Communities

Group Members: Nishchay Rajpal ,Shubham Gupta ,Sujal Patil,Mihir Bhatkar

Mentor: Mrs. Pallavi Saindane

Abstract: Housing Society Management System is a project that effectively manages and handles all the functioning of a co-operative housing society. The software system can store the data of various flat owners along with their necessary information. This project deals with the important things which directly or indirectly plays a vital role in residential life.

3.29	**Mobile app for Cab Sharing**
Goal	**11** Sustainable cities and Communities

Group Members: Ashutosh Mishra,Om Borate,Swapnil Thatte,Suraj Patel

Mentor: Mrs. Sujata Khandaskar

Abstract: The objective of our project is to share the taxi in an effective way by reducing the time and cost of the passenger, which will also reduce the road traffic and in turn reduce the air pollution caused by the traffic. Nowadays due to the pandemic we are supposed to follow the compulsory guidelines.

3. 30	**Restaurant Management System**
Goal	**11** Sustainable cities and Communities

Group Members: Jayesh Repale,Pratik Sawlani,Gaurav Amarnani,Kritika Yadav

Mentor: Mrs. Sujata Khandaskar

Abstract: We will provide a subscription based model for the owners of restaurants where they can get analytical data about their best selling dishes. We will provide an interface for customers to sign up and login for every business and users could get benefits like getting chosen for discounts and special offers .This project will contain the menu and then adds up the selected items by customer and sums up the total of all items, adds tax and service charges and displays total bill with charges.

3.31	**WorkFlow-an app for employee management**
Goal	**11** Sustainable cities and Communities
Group Members: Yashvi Dhar,Japneet Rajput,Aayush Pathak,Aaditya Khetwani	
Mentor: Mrs. Veena Trivedi	

Abstract: Employees are the backbone of every organization and handling their data has always proved to be challenging. Over the years, paper-based systems for information management have been carried out across most of business and organizational sectors. Overcoming this problem is the main focus of this project in order to reduce the risk of redundancy and avoid unnecessary labor. This application can maintain and view computerized records of information like employee data, attendance, number of leaves taken etc that can be accessed at any time by the employee or the administration.

3.32	**Crop Management System**
Goal	**15** Life on Land
Group Members: Khushi Rajesh Bhatia ,Khushboo Harpal Kimtani ,Aditya Mundas,Deepali Duseja	
Mentor: Mrs. Prerna Solanke	

Abstract: Most farmers are unaware of their soil quality and are unable to get quality seeds and inputs for their farms. Our project would help them to gain additional information about their soil along with suitable crops and a section from which they can buy good quality inputs.

3.33	**Crime Reporting and Management System**
Goal	**16** Peace, Justice and Institutions
Group Members: Nishtha Batra, Drishti Samvedi,Tithi Jhamnani,Teesha Karotra	
Mentor: Dr. Rohini Temkar	

Abstract: The main objective of the Crime Reporting and Management System is to manage the details of Crime, Criminal, Public, Solutions and Department. The users can view FIRs, Missing People and Wanted People List and add FIR and Missing Person Reports. The police officers can add and update the status of the reports while the administrator can update and delete the reports i.e. have access to the entire system. The purpose of the project is to build an application program to make the system more efficient and effective for the citizens of the country as well as the administrators.

IV	**Image Processing**
4.1	**Path-o-Mind: Online exams' cheating Detector System**
Goal	**4** Quality Education

Group Members: Bhavesh Bhatia, Abhayvir Singh, Pranav Ubarhande, Suhail Shaikh

Mentor: Prof. Vidya S Zope

Abstract: Since March 2020, education and exams have been conducted virtually which has made monitoring of students during exams difficult and hence increased dishonesty among them. Path-o-mind is a novel approach for the detection of cheating in online exams to extend the support given to the invigilator and institutes. Our main focus will be on Image Processing with some of the innovations like face detection and eye tracking, while also providing basic features like posting of questions by teachers and answering questions from students side.

4.2	**Website for document organization**
Goal	**8** Decent Work and Economic Growth

Group Members: Meera Sawantdesai, Aditi Bhatia, Tanisha Patil, Trishala Jeswani

Mentor: Dr. Sharmila Sengupta

Abstract: The project Website for Document Organization enables the user to select their profession and create a customized website for storing their important documents in a safe and secure repository. The benefit of such a website is that it will enable the user to find the right documents at the right place for daily life references, traveling etc- so that one doesn't need to carry them.

4.3	**License plate Recognition**
Goal	**9** Industry Innovation and Infrastructure

Group Members: Meet Chhabria, Kaustubh kharche, Sakshi Shinde , Muskan Bahrani

Mentor: Mrs. Rupali Hande / Mrs. Priti Joshi

Abstract: License Plate Recognition System (LPRS) is a technology for identifying vehicles by their license plates using image processing and is an important field of research. The number plate information is extracted automatically from the image of a vehicle or from a sequence of images without direct human intervention.
LPRS is divided into 4 phases:
1. Capturing Pictures of Vehicles
2. Pre-Processing of image
3. Obtaining the picture of the license plate
4. Optical Character Recognition.
This project presents an efficient approach for license plate extraction from a preprocessed vehicle input image using 1. RGB to Grayscale Conversion 2.Obtaining Gradient of an image 3. Noise removal using bilateral filter() method.4.obtaining binary form of image. 5. Edge Detection using Canny method 5.Contrast Enhancement of image 6.Morphological opening of image 7. Subtraction of image8.Sharpening of Image using filter2D() method

4.4	**Car License Plate Recognition using OpenCV and Raspberry Pi**
Goal	**9** Industry Innovation and Infrastructure

Group Members: Sahil kishnani, Rahul fatnani, Vansh Takrani, Sahil nagdev

Mentor: Mr. Sanjay Mirchandani

Abstract: Automatic number plate recognition (ANPR) is an image processing technology which uses a number (license) plate to identify the vehicle. The objective is to design an efficient automatic authorized vehicle identification system by using the vehicle number plate.

4.5	**Image Classification from Dataset**
Goal	**11** Sustainable Cities and Communities

Group Members: Sahil Madhyan,Anuj Bagad, Divesh Chhoda, Aayush Talreja

Mentor: Ms. Pallavi Gangurde

Abstract: This research study about image classification by using the deep neural network (DNN) or also known as Deep Learning by using framework TensorFlow. Java is used as a programming language because it comes together with the TensorFlow framework. The input data mainly focuses on flower categories that have been used. We have chosen DNN as its best option for the training process & it provides a high percentage of accuracy.

V	**Cloud Computing**
5.1	**Next Generation Web Application Development**
Goal	**9** Industry Innovation and Infrastructure

Group Members: Sanket Anand Jaiswal,Swapnil Sakpal,Aditya Nehete,Harsh Bhaktar

Mentor: Mrs. Sunita Suralkar

Abstract: Today the amount of information on the internet grows very rapidly and people need some instruments to find and access appropriate information. One of such tools is called a recommendation system. Recommendation systems help to navigate quickly and receive necessary information. Generally they are used in Internet shops to increase the profit. This paper proposes a quick and intuitive book recommendation system that helps readers to find appropriate book to read next. The overall architecture is presented with its detailed description.