



## Club Report

### Contents

A.	Members of the Club .....	2
	Faculty in-Charge.....	2
	President.....	2
	Senior Mentors - .....	2
	Junior Mentors .....	2
B.	Year in Review .....	3
C.	Lecture Series.....	4
	1. Lecture 1 : Python.....	4
	2. Lecture 2 : Python Datatypes.....	4
	3. Lecture 3 : Object Oriented Programming in Python: .....	5
	4. Lecture 4 : Python NumPy.....	6
D.	Blogs .....	8
	1. Activation Function In Neural Networks.....	8
	2. Algorithmic Trading .....	8
	3. Apriori Algorithm .....	8
	4. Artificial Intelligence-The Future of Football .....	8
	5. An Insight into Tesla Autopilot AI .....	8
	6. Spotify's Algorithm.....	9
E.	Research Projects.....	10
	1. Music Recommender System: .....	10
	2. Car Damage Detection.....	10
	3. Accent Recognition:.....	10
	4. Question Answering System:.....	10
	5. Lip Reading: Delving into Deep Learning: .....	11
	6. Stock Market Prices and Returns Forecasting using Deep Learning based on Technical and Fundamental Analysis:.....	11



## **A. Members of the Club**

**Faculty in-Charge** - Prachi Tawde

**President** - Manav Shah

**Senior Mentors** -

There are 4 senior mentors:

- Meet Shah
- Rishabh Nevatia
- Shivam Kejriwal
- Varun Vora

**Junior Mentors** -

There are 9 junior mentors:

- Aryan Ringshia
- Chirag Jagad
- Karan Nandaniya
- Jainam Rambhia
- Jay Thadeshwar
- Neil Desai
- Rashi Lodha
- Umang Jhunjhunwala
- Ved Mistry



## B. Year in Review

It has been a year of change and improvement at DJ Init.ai Club. We have focused on our team members and worked on refining their skill sets, so that we can continue to deliver our hallmark events and activities. This year we focused on :

- **AI Lecture Series** : This series is aimed at lecturing and mentoring students who are in the second year of their degree about AI and its fundamentals. Students who attend the lectures are given assignments that help them strengthen the foundation of the topics taught in the lectures.
- **Blogs** : Blogs are written and published by our junior mentors. These blogs are focused on AI topics.
- **Research Projects**: Junior mentors are guided and mentored by the Senior mentors to work on projects that enable them to do quality research work.

The following sections give a detailed review of each of the activities/events mentioned above.



## C. Lecture Series

### 1. Lecture 1 : Python

Name of the Speakers: Rashi Lodha , Jainam Rambhia.

Venue: MS Teams

Date: 19th November, 2021

Time: 2:00 pm – 3.30 pm

Class: Second Year BTech IT

Attendance: 115

Topic: Introduction to Python I – Basics and Fun Tricks

Description:

The quick informative lecture on Python Basics for the Second-Year students was conducted by the Junior Mentors of the club. The lecture covered a brief recap of python syntax and data structures , if else else-if conditions, arithmetic operations , basic for and while loops, range function , enumerate function and functions with return statement in Python. The SEs were provided with a link for a tutorial of basic python syntax. . The different unique data types and data structures were introduced to the SEs and the methods that are often used with these data types. Following that students were shown some fun tips and tricks unique to python, why python as a programming language is so easy and fun to learn and code. A google collab notebook was also shared with the juniors which had cheat sheets for the topics covered in the lecture. This notebook also touched those topics which are not that often used but will be helpful for students who want to deep dive into the Python world . During the course of the lecture we took some polls and questions on Mentimeter an interactive presentation tool so as to gauge student comprehension ,test knowledge retention and make it a fun way to break up learning. This at the same time enabled every voice in the classroom to be heard. Answers to all the questions asked during the same were provided with a proper reason so that students who couldn't make it to the solution know why they are wrong. Finally, SE's were given some questions and a brainstorming session was done for the solutions of the same. The code was explained and the students were given enough time to implement it as well. The response received was quite good and we had a footfall of 84 students attending the lecture. The overall session was an interactive one with the students asking the doubts and getting them solved by the Mentors. The students were satisfied with the lecture according to the results we got in the feedback form. The lecture ended on a good note building up the curiosity to attend the upcoming lectures.

### 2. Lecture 2 : Python Datatypes

Name of the Speakers: Ved Mistry, Neil Desai.



Venue: MS Teams

Date: 25th November 2021

Time: 21:00 – 22.00

Class: SY BTech Information Technology

Attendance : 59

Topic: Introduction to Python I – Sets, Tuples, Lists and Dictionary and NumPy

Description:

The quick informative lecture on Python Basics for the Second-Year students was conducted by the Junior Mentors of the club. The lecture covered a brief recap of data structures available (i.e. Sets, Tuples, Lists and Dictionaries), their descriptions, their available functions and also basics about the NumPy Array in Python. The SEs were provided with a link for a tutorial of Data structures in python. The different unique data structures were introduced to the SEs and the methods that are often used with these data types. Following that, students were shown how they can use the different data structure available in python efficiently and learn importance and functioning of each. A google collab notebook was also shared with the juniors which had cheat sheets for the topics covered in the lecture. This notebook also touched those topics which are not that often used but will be helpful for students who want to deep dive into the Python world. Answers to all the questions asked during the same were provided with a proper reason so that students who couldn't make it to the solution know why they are wrong. Finally, SE's were given some questions and a brainstorming session was done for the solutions of the same. The code was explained, and the students were given enough time to implement it as well. The response received was quite good and we had a footfall of 25 students attending the lecture. The overall session was an interactive one with the students asking the doubts and getting them solved by the Mentors. The students were satisfied with the lecture according to the results we got in the feedback form. The lecture ended on a good note building up the curiosity to attend the upcoming lectures.

### **3. Lecture 3 : Object Oriented Programming in Python:**

Name of the Speakers: Jay Thadeshwar, Karan Nandaniya

Venue: MS Teams

Date: 02nd December, 2021

Time: 09:00 pm – 10.00 pm

Class: Second Year BTech IT

Attendance: 52



Topic: Introduction to Object Oriented Programming Concepts in Python Description:

A detailed and elaborative lecture on Concepts of Object-Oriented Programming (OOP) in Python for the Second-Year students was conducted by the Junior Mentors of the club. The lecture initially started by developing the basic knowledge for the students on the theoretical side of OOP by making them understand what object oriented programming is, then comparison of OOP vs POP with the help of an approach-based example in which they were demonstrated with the problem of banking system and shown different approaches used by the two programming paradigms to solve the problem i.e. OOP and POP continue with the need for the invention of OOP programming paradigm. Various pictorial representation of the concepts were included in the notebook after a certain interval in order to grab SEs attention. Later, the lecture continued by covering the coding aspect of OOP where the syntax of class, objects, constructors were introduced to them. Following that students were demonstrated the concepts of class methods and functions along with the code snippets. After that we had a brief discussion about the four main pillars of OOP- Encapsulation, Inheritance, Polymorphism and Abstraction. Beginning with Encapsulation, they were introduced to the concept of Information hiding and encapsulating different components together which are working on the same data. The same concept was then demonstrated to them with the help of code by accessing and modifying the private variables of class directly and also through class methods. Further Inheritance and the various types of Inheritance were discussed with proper diagrammatic visualization of its types along with its syntax. Each and every type of Inheritance had its own example code for a better understanding to make SEs comfortable with coding in Python. After that we had a brief conceptual discussion about Polymorphism in Python explaining the concept of Method Overriding. Finally, the fourth and the last pillar of OOP - Abstraction made its way into the session giving an insight about the concept of Abstract classes in Python and their uses and how those abstract methods can be implemented in the child class. During the course of the lecture, SEs were encouraged to ask and clear the doubts they had in their minds by the junior mentors. Answers to all the questions asked during the same were provided with a proper reason so that students who couldn't understand it in the first try were able to keep up with the lecture and the lecturer's pace. Overall, the session was fun and interactive with SEs interacting with the mentors to gain a deeper understanding about the core concepts. The students were satisfied with the lecture according to the feedback taken at the end of the session. The lecture ended on a good note building up the curiosity to attend the upcoming lectures and dive deeper further in AI/ML.

#### **4. Lecture 4 : Python NumPy**

Name of the Speaker: Aryan Ringshia , Umang Jhunhunwala.

Venue: MS Teams

Date: 6th January, 2022

Time: 9:00 pm– 10:00 pm



Class: Second Year BTech IT

Topic: Python NumPy

Description:

The quick informative lecture on Python NumPy for the Second-Year students was conducted by the Junior Mentors of the club. The lecture covered a brief recap of python data structures (list, tuple, dictionary, set. Following that students were shown given an introduction to NumPy and its importance in Data Science and Machine Learning. A google collab notebook was also shared with the juniors which explained the syntax of NumPy. The students were also explained the various ways to initialize and access/index a NumPy array. Integer indexing and Boolean indexing was also explained. In addition to the above topics, NumPy broadcasting was also taught which helped them to understand the concept of NumPy better. In order to gauge student comprehension, test knowledge retention and make it a fun way to break up learning, doubts were frequently asked. This at the same time enabled every voice in the classroom to be heard. Answers to all the questions asked during the same were provided with a proper reason so that students who couldn't make it to the solution know why they are wrong. The code was explained and the students were given enough time to implement it as well. The overall session was an interactive one with the students asking the doubts and getting them solved by the Mentors. The lecture ended on a good note building up the curiosity to attend the upcoming lectures.



## D. Blogs

### 1. Activation Function In Neural Networks

This blog describes need of activation functions, various types of activation functions and their advantages and disadvantages

Link: <https://djinit-ai.github.io/2020/09/27/sigmoid.html>

### 2. Algorithmic Trading

This blog describes Algorithmic Trading. Algorithmic trading (also called automated trading or algo-trading) uses a computer program that follows a defined set of instructions (an algorithm) to place a trade. Algorithmic trading makes use of complex formulas, combined with mathematical models and human oversight, to make decisions to buy or sell financial securities on an exchange.

Link : <https://djinit-ai.github.io/2020/09/27/Algorithmic-Trading.html>

### 3. Apriori Algorithm

This blog explains Apriori Algorithm. Apriori algorithm uses frequent itemsets to generate association rules. The rules devised during the process of Associate Rule Mining (ARM) are called Associate Rules. Being an integral part of Data Mining, ARM helps us create simple IF/THEN rules statements that help discover relationships and patterns between items in the database, and to consequently predict the next item set.

Link : <https://djinit-ai.github.io/2020/09/22/apriori-algorithm.html>

### 4. Artificial Intelligence-The Future of Football

For many centuries, the use of technology in football has been minimal, however seeing the advancements in the field of AI, one can already expect AI to be a very big part of Football. From using Computer Vision for getting tracking data to using plotting libraries and machine learning algorithms to make sense of the data, there is a lot of potential for such advancements. The current applications of AI that are being implemented in Football are Goal Line Technology (GLT), Video Assistant Referee (VAR), Electronic Performance and Tracking Systems(EPTS) and many more.

Link: <https://djinit-ai.github.io/2020/09/20/AI-in-Football.html>

### 5. An Insight into Tesla Autopilot AI

Tesla Autopilot is a suite of advanced driver-assistance system features offered by Tesla that has lane centering, traffic-aware cruise control, self-parking, automatic lane changes, semi-autonomous navigation on limited access freeways, and the ability to summon the car from a garage or parking spot. In all of these features, the driver is responsible and the car requires constant supervision. The company claims the features reduce accidents caused by driver negligence and fatigue from long-term driving.





Link : <https://djinit-ai.github.io/2020/08/16/an-insight-into-tesla-autopilot-ai.html>

## **6. Spotify's Algorithm**

Spotify's recommendation system is built on the belief to provide each and every user a personalised feel and a sense of uniqueness to his/her listening experience. Its goal is to quickly help users find something they are going to enjoy listening to, according to a presentation by Spotify Research director Mounia Lalmas-Roelleke at the Web Conference earlier this year.

Link : <https://djinit-ai.github.io/2020/04/16/Spotify's-algorithm.html>



## E. Research Projects

### 1. Music Recommender System:

Problem Statement : Mood based recommender system will detect mood of the user and recommend the music accordingly. This project uses Computer Vision and Deep learning techniques to identify the mood of the user and then based on the mood recommend music.

Team Members:

- Aryan Ringhasia
- Neil Desai

### 2. Car Damage Detection

Problem Statement : For an average person it is difficult to estimate the cost of repair and the type of damage done to the car. This project will detect car damage and estimate repair cost using Image Detection and Computer Vision

Team Members :

- Ved Mistry
- Umang Jhunjhunwala

### 3. Accent Recognition:

Problem Statement : In ASR(Automatic Speech Recognition), one of the profound variability is accent. It is very important to deal with this variability in order to build effective ASR systems .This project aims at handling this variability by performing accent recognition using AI.

Team Members :

- Rashi Lodha
- Jainam Rambhia

### 4. Question Answering System:

Problem Statement : Question Answering Systems (QAS) have special significance and advantages over search engines and are considered to be the ultimate goal of semantic Web research for user's information needs. Question answering system is concerned with building systems that automatically answer questions posed by humans in a natural language.

Team Members :

- Jay Thadeshwar
- Karan Nandaniya



### **5. Lip Reading: Delving into Deep Learning:**

Problem Statement : Lip reading is the task of screening the lips of the user and producing natural language as the output. This paper focuses on review and comparison of various lip-reading techniques and systems.

Team Member :

- Meet Shah
- Rishabh Nevatia

Accepted and Published at International Journal for Research in Applied Science & Engineering Technology (IJRASET)

DOI :<https://doi.org/10.22214/ijraset.2021.38216>

### **6. Stock Market Prices and Returns Forecasting using Deep Learning based on Technical and Fundamental Analysis:**

Problem Statement : The stock market is a global network that facilitates practically all significant economic transactions at a dynamic rate known as the stock value, which is based on market equilibrium. The nature of the stock market makes it incredibly challenging to predict and analyse stock market data in general. It is inherently non-linear, dynamic, complex, nonparametric, and chaotic, which makes it incredibly difficult to parse useful information from and model.

Team Member :

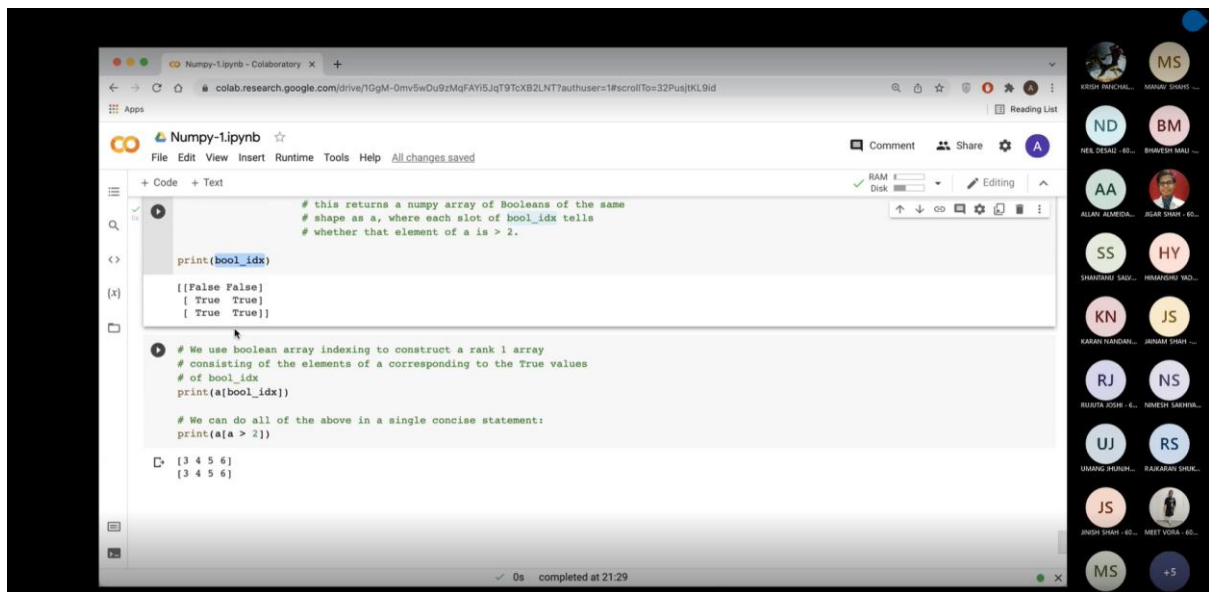
- Manav Shah
- Varun Vora

Accepted for Publication after presentation at ICTCS'21 on December 18, 2021.

Springer - Lecture Notes in Networks & Systems

Journal: (ICTCS 21 - International Conference on Information and Communication Technology for Competitive Strategies)

## NumPy Session



The screenshot shows a Jupyter Notebook interface with the following content:

```
# this returns a numpy array of Booleans of the same
# shape as a, where each slot of bool_idx tells
# whether that element of a is > 2.

print(bool_idx)

[[False False]
 [ True  True]
 [ True  True]]

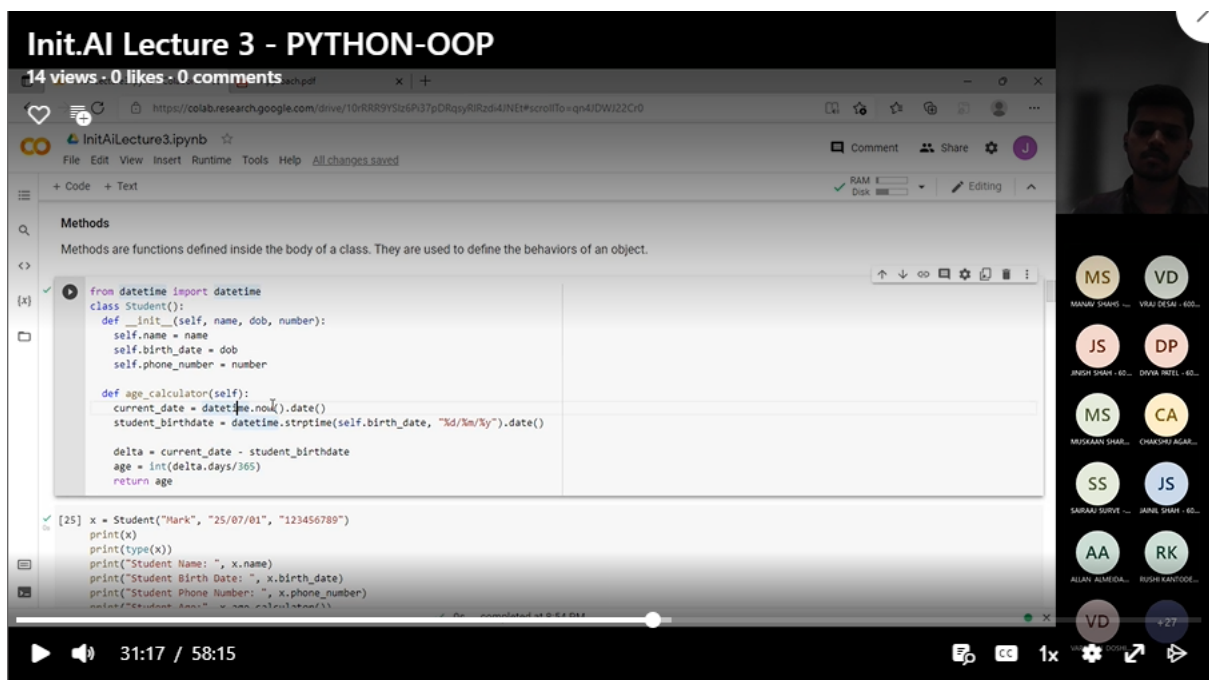
# We use boolean array indexing to construct a rank 1 array
# consisting of the elements of a corresponding to the True values
# of bool_idx
print(a[bool_idx])

# We can do all of the above in a single concise statement:
print(a[a > 2])

[3 4 5 6]
[3 4 5 6]
```

The output shows the resulting boolean array and the filtered values from the original array.

## OOPS Lecture



The screenshot shows a video player displaying a lecture titled "Init.AI Lecture 3 - PYTHON-OOP". The video content shows a Jupyter Notebook with the following Python code:

```
from datetime import datetime
class Student():
    def __init__(self, name, dob, number):
        self.name = name
        self.birth_date = dob
        self.phone_number = number

    def age_calculator(self):
        current_date = datetime.now().date()
        student_birthdate = datetime.strptime(self.birth_date, "%d/%m/%y").date()
        delta = current_date - student_birthdate
        age = int(delta.days/365)
        return age

[25] x = Student("Mark", "25/07/01", "123456789")
print(x)
print(type(x))
print("Student Name: ", x.name)
print("Student Birth Date: ", x.birth_date)
print("Student Phone Number: ", x.phone_number)
print("Student Age: ", x.age_calculator())
```

The video player interface includes a progress bar at 31:17 / 58:15 and a list of participants on the right side.

InitAI\_Lecture3.ipynb - Colaboratory

colab.research.google.com/drive/106RR9Y5z6P37pDRqpyR2d4iN3#scrollTo=7i-0nXBpr-5w

File Edit View Insert Runtime Tools Help Last saved at 9:23 PM

+ Code + Text

dog barking  
Animal Speaking

### Multiple Inheritance

```

class Calculation1:
    def Summation(self,a,b):
        return a+b;

class Calculation2:
    def Multiplication(self,a,b):
        return a*b;

class Derived(Calculation1,Calculation2):
    def Divide(self,a,b):
        return a/b;

d = Derived()
print(d.Summation(10,20))
print(d.Multiplication(10,20))
print(d.Divide(10,20))

```

30  
200  
0.5

Python Lec01.ipynb - Colaboratory

colab.research.google.com/drive/1BAZGgjuC-r5ORMF2cnaX2UlnHwC#scrollTo=elyTKktZwWm

File Edit View Insert Runtime Tools Help Saving failed since 2:14 PM

+ Code + Text

### Taking Inputs from the User

```

# name = input("Enter your name: ")
# print(f"Name: {name}")

Enter your name: Jainan
Name: Jainan

[ ] num1 = int(input("Enter first number: "))
num2 = int(input("Enter second number: "))
sum = num1+num2
print("Addition: " + str(sum))

# name = str(input("Enter name: "))
# print(f"Hello {name}")

```

### Strings in Python

1 #Indexing

Python Lec01.ipynb - Colaboratory

colab.research.google.com

File Edit View Insert Runtime Tools Help All changes saved

+ Code + Text

```

# name = str(input("Enter name: "))
# print(f"Hello {name}")

Strings in Python

[16] long_string '''
-0 - 0
0
....
print(long_string)

-0 - 0
0
....

[Indexing]
name = "Hello World"
# 01234
# print(name[0])
# print(name[-1]) I
# print(name[1])
# print(name[1:-1])

[ ] # len() function
# methods in strings , uppercase, lowercase, replace, find, in
brand = 'nike is my favourite brand'
# print(len(brand))
print(brand.capitalize)

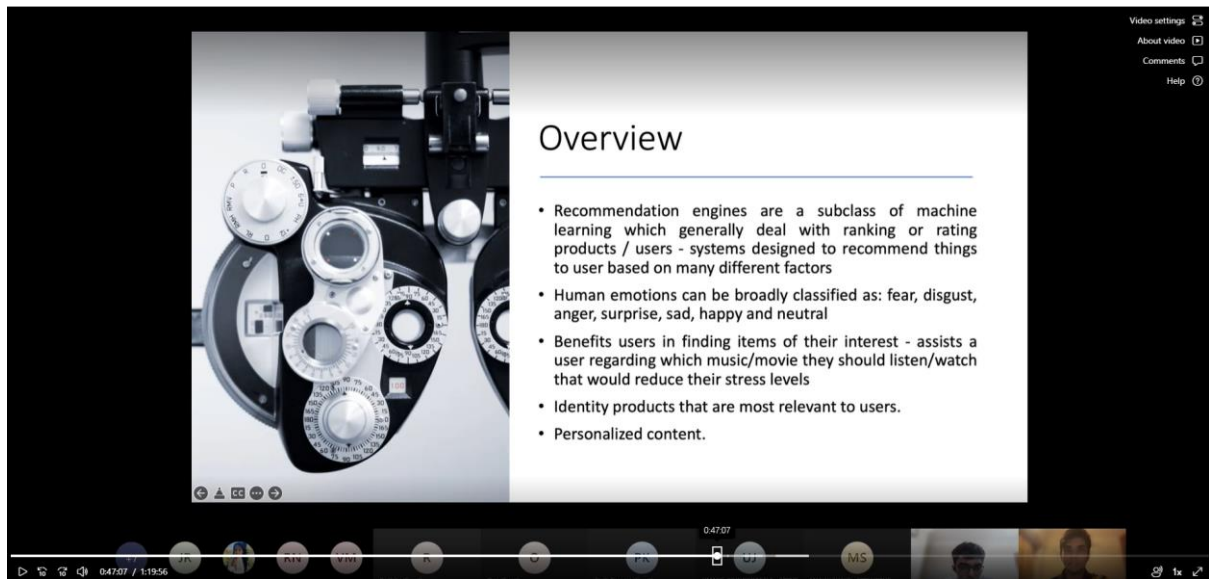
```

0:18:34

0:18:34 / 1:13:31

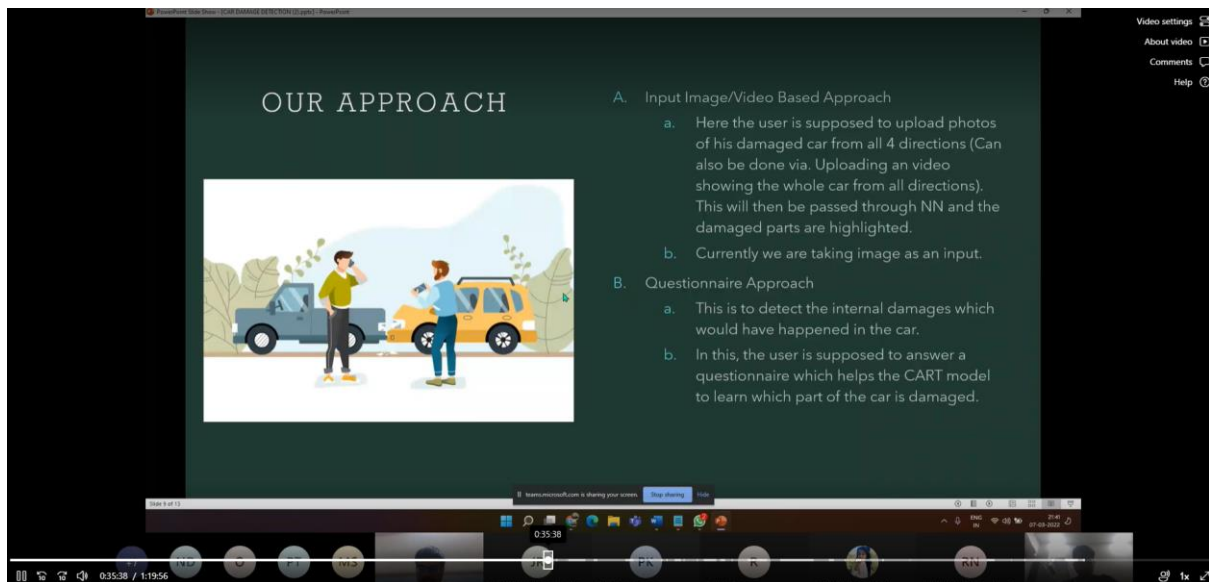
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## Project Presentations-II



**Overview**

- Recommendation engines are a subclass of machine learning which generally deal with ranking or rating products / users - systems designed to recommend things to user based on many different factors
- Human emotions can be broadly classified as: fear, disgust, anger, surprise, sad, happy and neutral
- Benefits users in finding items of their interest - assists a user regarding which music/movie they should listen/watch that would reduce their stress levels
- Identify products that are most relevant to users.
- Personalized content.



**OUR APPROACH**

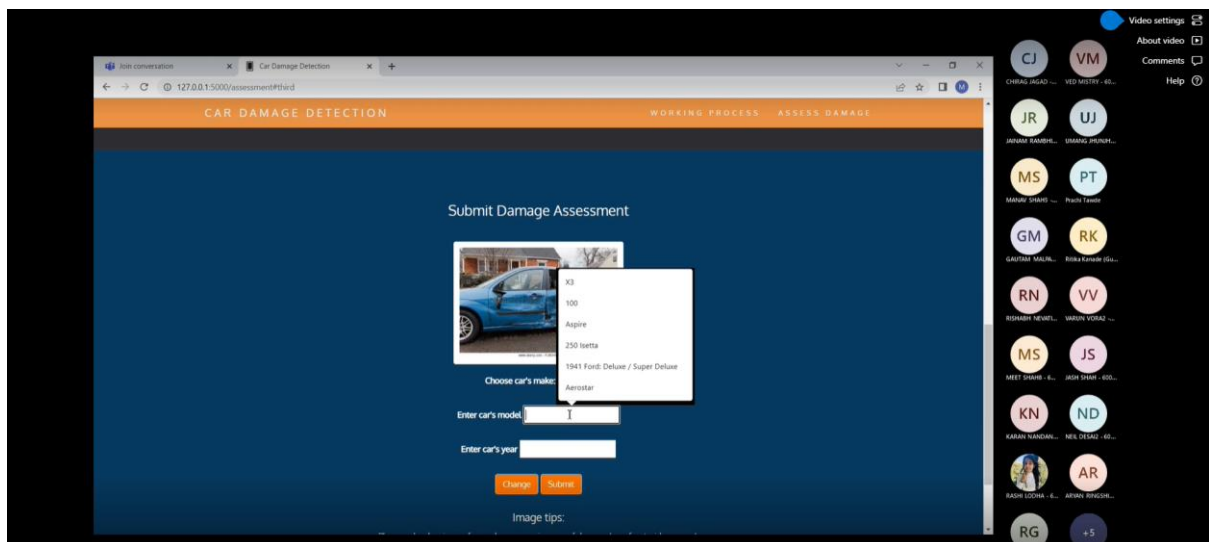
A. Input Image/Video Based Approach

- a. Here the user is supposed to upload photos of his damaged car from all 4 directions (Can also be done via. Uploading an video showing the whole car from all directions). This will then be passed through NN and the damaged parts are highlighted.
- b. Currently we are taking image as an input.

B. Questionnaire Approach

- a. This is to detect the internal damages which would have happened in the car.
- b. In this, the user is supposed to answer a questionnaire which helps the CART model to learn which part of the car is damaged.

## Project Presentations-II



**CAR DAMAGE DETECTION**

WORKING PROCESS ASSESS DAMAGE

Submit Damage Assessment

Choose car's make:

- X3
- 100
- Apprie
- 250 ietta
- 1941 Ford: Deluxe / Super Deluxe
- Aerostar

Enter car's model:

Enter car's year:

Image tips: