I'mBesideYou Inc Internship

Project Title: Clock-O-Mentia (Web Application)

Student Name:- Utsav Raj

College- IIT (ISM) DHANBAD
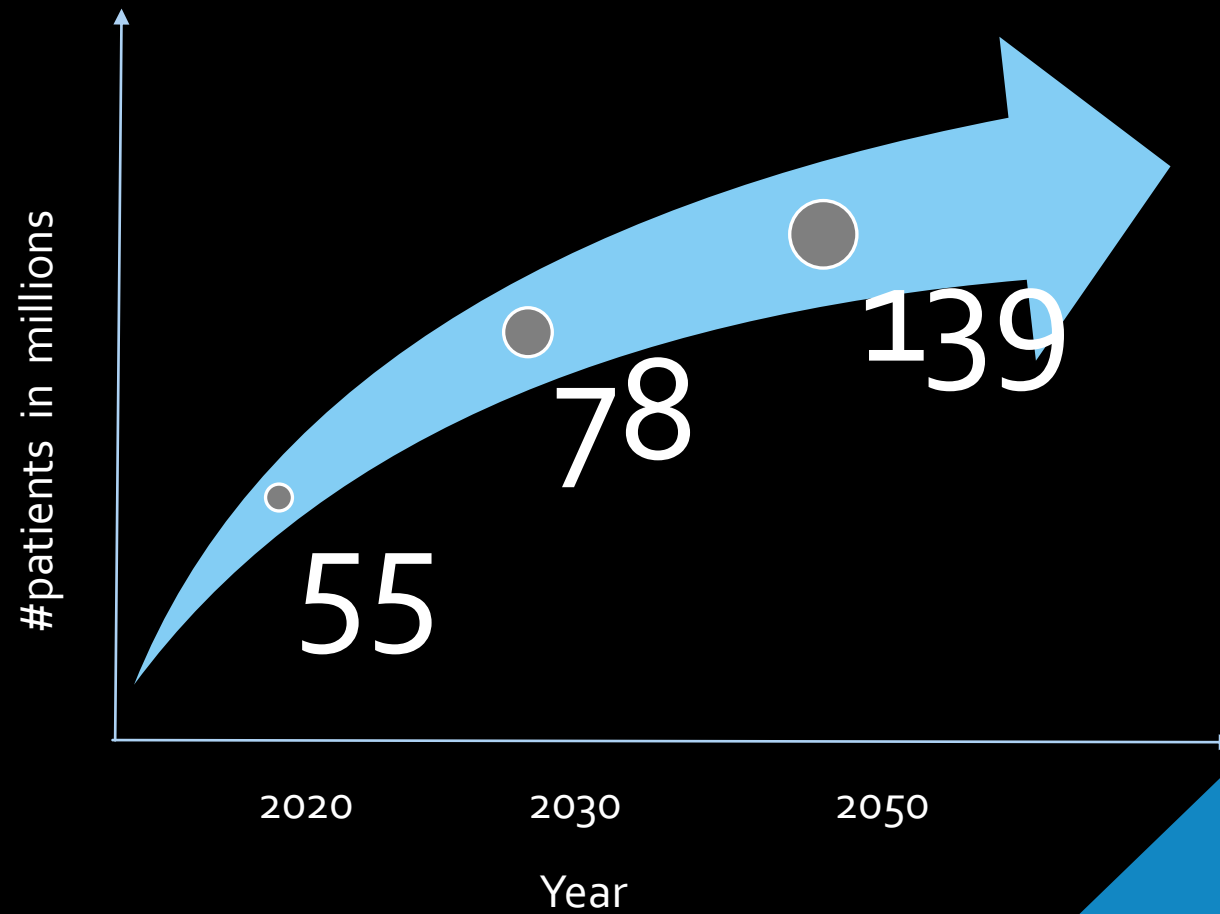Branch- Computer Science and Engineering

Project and Developer Details

- Hi! My name is Utsav Raj, and I am a 3rd Year student pursuing bachelor of Technology in Computer Science and Engineering from IIT (ISM) Dhanbad. I have made this web application for detecting Dementia using clock drawing test. The user will upload an image based on the given instruction and CNN model will be used to score the test. The name of CNN Model is Efficient Net and it the model will return 6 values between 0-5 and the probability corresponding to each value

- This Model also has been developed, trained and deployed by me and accuracy of 92% has been achieved.
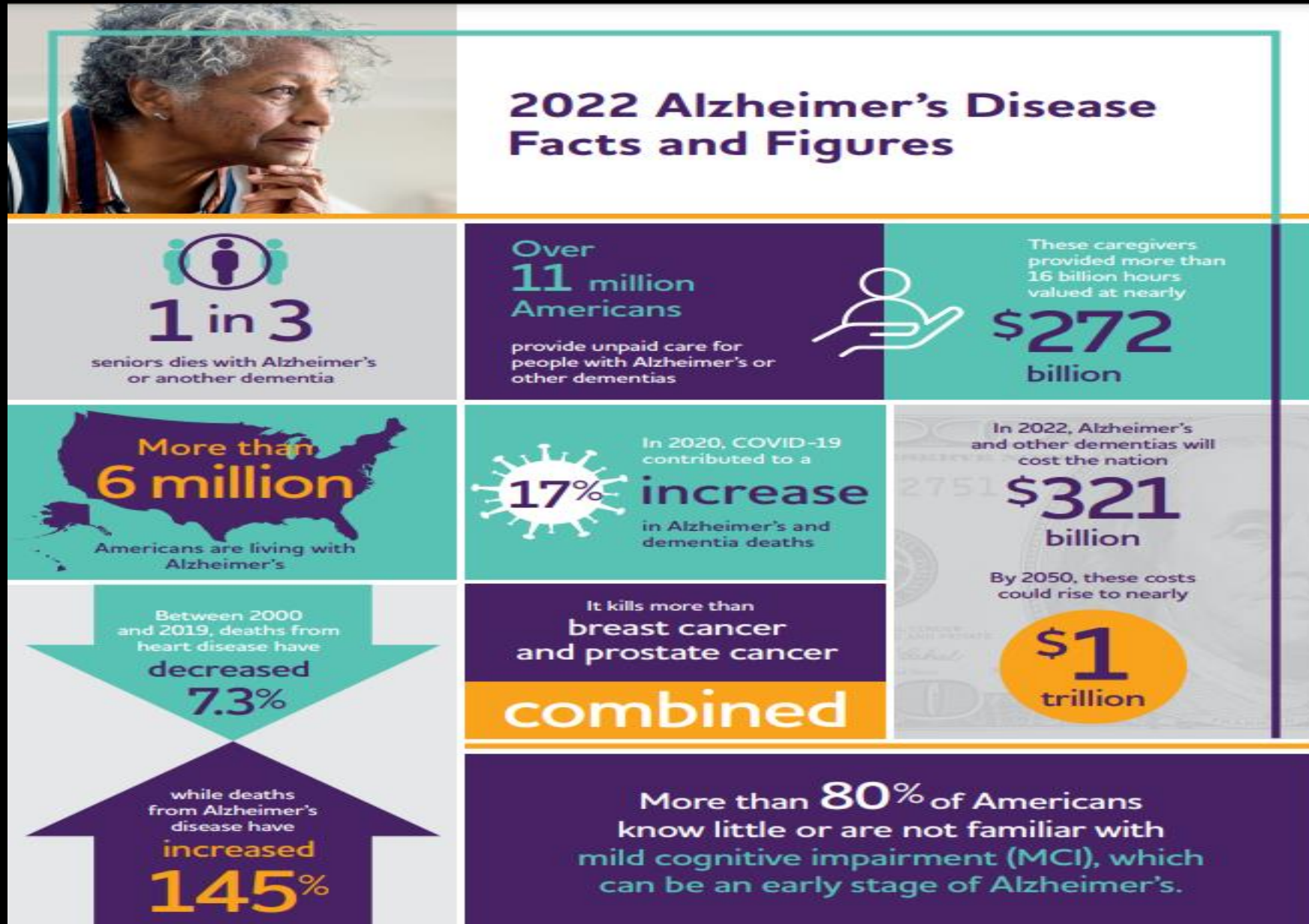
Why AI used in BackEnd?

- This Model is made using Python and is deployed using a python framework called Flask. Hence , it was easy to integrate the ML Model and Flask as both are in Python.

- From the Frontend, the user uploads the clock image and we make the API Call, which makes a post request on the Backend and we get our output.

- Using this technique, both the frontend and backend are separated. Also, the API in backend can also be used to make app.

Technology – Computer Vision

Dementia is one of the most common neurocognitive syndromes in the world, in which the memory and the ability to perform daily life activities deteriorate and get worse.
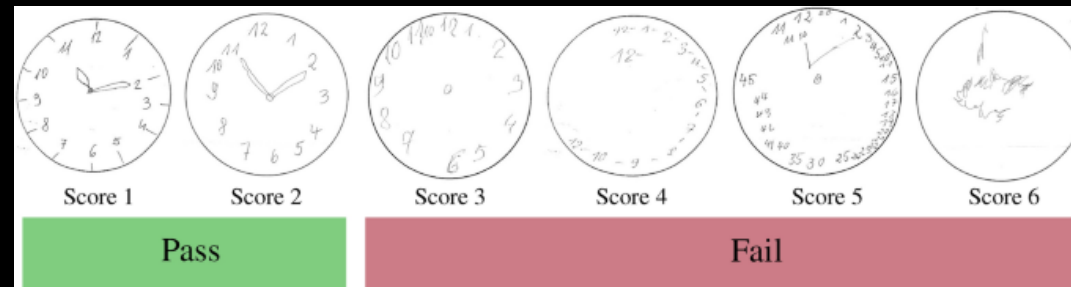
Some Alarming Figures

Why Is Early Detection Important ?

- Dementia if detected early can help in better management of the disease and can save a person from a lifelong dependency on severe medication.

- Early diagnosis saves cost of long term medical care for both families and the government .

- According to a survey conducted in the United States , among all Americans alive today if those who will get Alzheimer's disease were diagnosed when they had mild cognitive impairment , before dementia, it would collectively save approximately $7 trillion in healthcare costs.

Proposed Solution

Clock Drawing Test

- The CDT is a proven preliminary test for detection of neurocognitive diseases like dementia

- In it the patient is given a pen and a paper and he is asked to draw an analog clock on it and show the time "11:10"

- Based on how the patient draws ,a medical practitioner can detect the chances of the patient suffering from dementia

- Our solution uses the proven clock drawing test and digitalizes it using high precision deep leaning models to facilitate early detection of dementia and other neurocognitive diseases.
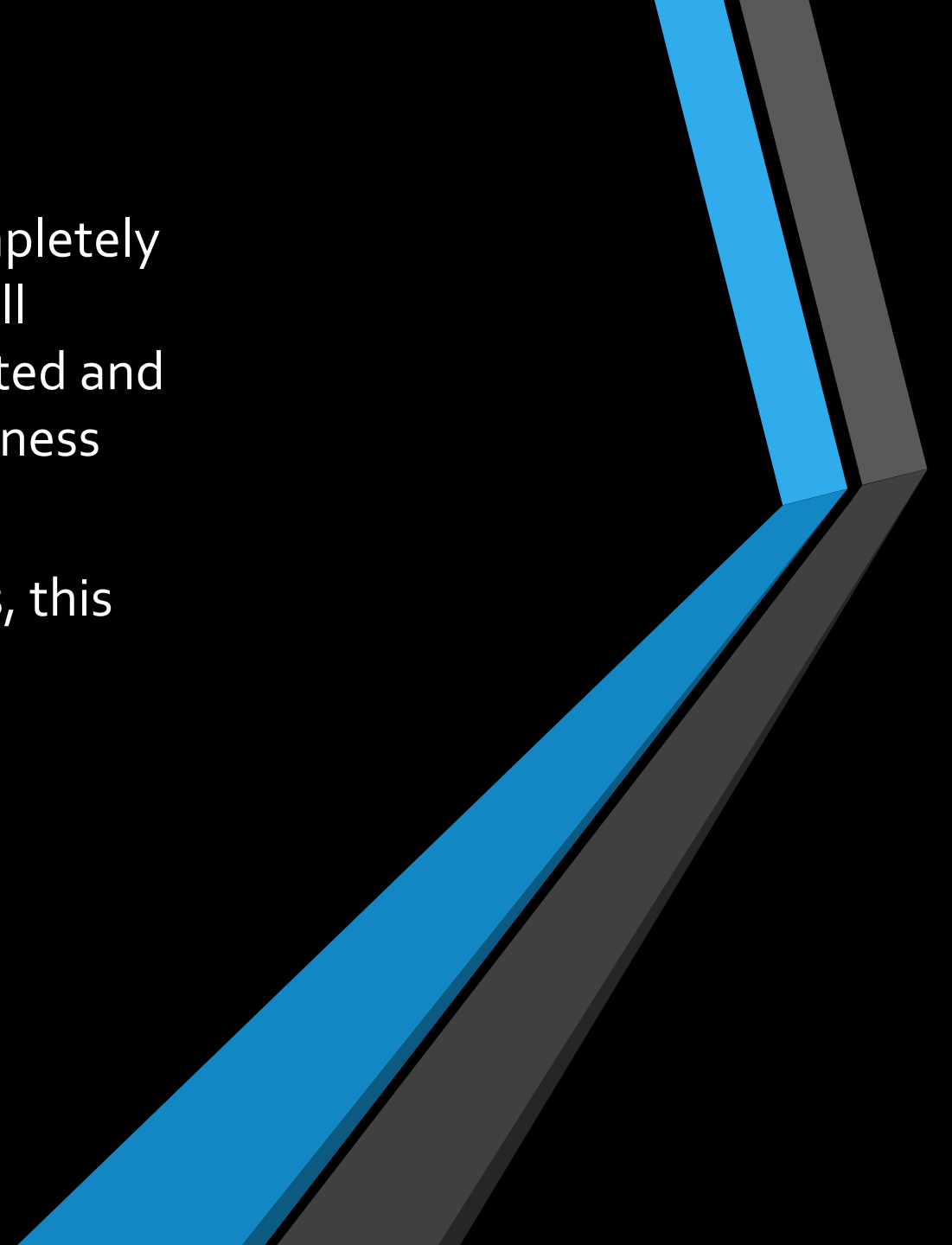
Clock-O-Mentia

1) Data collected from NHATS.

2) Variants of EFFNETS used as base learners

3) Focal loss used along with Adam optimizer

4) Achieved a test accuracy of 92%

Social Impact of the Idea

- The app provides its users free of cost and completely digital test to detect dementia, thus in itself will encourage a large number of people to get tested and will help in increasing the general public awareness regarding these issues.

- As more and more users get connected with us, this will help in removing the stigma surrounding these disorders.

Business Model

- Customer Base → Patients
- Customer Base → Doctors

- Key resources : DataBase, GPU enabled Cloud Services

- Key activities: As of now the product is completely free for the patients and we plan to charge a commission fee from the doctors end. We are also thinking about a Freemium model for the patients where the diagnosis and consultation will be free but we will also provide healthcare assistance like reminder tracking for the premium users.

- Value proposition : The product will increase the patient base of the doctors and increase their visibility as well. On the other hand, the patients get an easy, remote and free of cost access to diagnosis and consultation.