**PROJECT SYNOPSIS**

ON

**Crowd Social Distance and Mask Detection**

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**Submitted By: Guided By:**

Abhishek Suyal (Section: B / 1918130) Mr. Mukesh Kumar

Ankit Negi (Section: C / 1918614)

Mahima Bisht (Section: I / 1918443)

Shubham Parihar (Section: B / 1918716)

**DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY**

**GRAPHIC ERA HILL UNVERSITY, DEHRADUN**

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Thank you,

Abhishek Suyal, Ankit Negi

Mahima Bisht, Shubham Parihar

B. Tech (Computer Science and Engineering)

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**1. ABSTRACT**

Health is the most crucial aspect of a human's life. A person with all the fortune in the world cannot be happy if they are suffering from a disease. In today's fast-moving world, we have made everything digital except our medical records. Many hospitals still give medical reports to their patients on paper. This not only makes managing medical reports harder for the patient but also makes it too difficult to change doctors or cities since the patient will have to carry all their medical documents with them wherever they go.

We aim to fix this issue by building a platform where both Doctors and Patients can create their accounts to store and share medical reports and prescriptions. This platform will not only be limited to sharing medical documents. With the permission of a patient, we can run Machine Learning models on their data to provide crucial insights into their health like potential disease, allergies, diet recommendation, and many more.

**2. INTRODUCTION**

The project we are working on is a decentralized machine learning based health care platform which will provide a means for both patients and doctor to communicate and ease their work.

**2.1 HISTORY**

**2.2 MOTIVATION**

What motivated us to make this project is the fact that most of the times patients are in doubt about their health care and the things to be done in sickness. We aim to assist patients in self-management and empowering them by helping them digitalize their resources such as medical records. India lacks a proper health care management system digitally and our platform would be beneficial both for patients and doctors. The thought that our knowledge in development can help the society in moving forward in medical field motivated us to make this project.

**2.3 PROBLEM STATEMENT**

Simply the process of getting medical treatment by letting patients store all their medical records in one place in the cloud and provide hassle free access of the same to their respective Doctors. Hospital and medical staff can also use our platform to send medical reports and prescriptions online directly to the patient. Doctor’s handwriting is hard to understand and sometimes impossible to read. We also aim to build doctor’s handwriting recognition system.

**2.4 OBJECTIVE**

1. Our main objective is to use cloud to store medical records so that the patient can easily manage them. People often lose their medical records, and we will provide them a platform to store their medical history and to interact with the doctors.
2. Most of the time, it is very difficult for patients to find the prescriptions readable. We aim to build doctor’s handwriting recognition system using CNN. In this, we will scan the image of the prescription, and it will predict the text written in it or will simply convert it to digital format.
3. Use of Machine Learning to provide key insights into patient’s health. It will provide doctors with access to medical records. This in turn, would make it easier for them to diagnose the patient.
4. One of the features that we would like to include in our project is that we will apply clustering on patient’s medical record. Clustering is a type of machine learning technique in which we group together similar type of data points in such a way that a particular group has similar type of data points, and those data points are dissimilar to data points of another group. The purpose of applying clustering on medical records of patient is that our model will group together the patients with similar illness and would suggest making an appointment at a particular date for that group.

**3. METHODOLOGY**

**3.2 FLOW CHART**

**3.3 TECHNOLOGY USED**

**TensorFlow**

TensorFlow is a free and open-source software library for machine learning and artificial intelligence. It can used across a range of tasks but has a particular focus on training and inference of deep neural networks. It was developed by Google Brain team for internal Google use in research and production. TensorFlow can be used in a wide variety of programming languages including Python, JavaScript, C++, and Java.

**Keras**

Kera is an open-source software library that provides a Python interface for artificial neural networks. Keras acts as an interface for the TenserFlow library. It focuses on being use-friendly, modular, and extensible. It was developed as part of the research effort of project ONEIROS (Open-ended Neuro-Electronic Intelligent Robot Operating System). Its primary author and maintainer is François Chollet, a Google engineer.

**OpenCV**

Open-Source Computer Vision Library (OpenCV) is a library of programming functions mainly aimed at real-time computer vision. It was developed by Intel and later supported by Willow Garage and Itseez. It is cross-platform and free for use under the open-source Apache 2 license. It also supports GPU acceleration for real-time operations.

**React.js (UI)**

React.js is an open-source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta and a community of individual developers and companies.

**Next.js (Routing, Bundling, and Code Splitting)**

Next.js is also an open-source web development framework created by Vercel. It lets developers build React based web applications that can be server-rendered, statically generated, or incrementally generated.

**Supabase (Database and Storage)**

Supabase is an open-source Firebase alternative. It uses a Postgres database under the hood. It provides services like database, authentication, automatic API generation, Edge functions, Realtime subscriptions, and Storage. Supabase has SDKs for Flutter and JavaScript.

**Vercel (Hosting)**

Vercel is a US based platform-as-a-service company. It maintains the Next.js web development framework. Vercel was founded by Guillermo Rauch in 2015 as Zeit. Deployments on Vercel are handled through Git repositories, with support for GitHub, GitLab, and Bitbucket repositories. Vercel’s infrastructure uses AWS and Cloudflare.

**3.4 DATASET USED**

The dataset that powers this project is courtesy of Kaggle user Larxel. He is a Senior Data Scientist at Hospital Israelita Albert Einstein in Brazil.

The dataset consists of 853 images belonging to 3 classes. These classes are “With Mask”, “Without Mask”, and “Mask Worn Incorrectly”.

The dataset is licensed under Public Domain and can found at the following URL:

<https://www.kaggle.com/datasets/andrewmvd/face-mask-detection>

The dataset was last updated 2 years ago and is 417 MB in size.

We are also thankful to Kaggle for providing a platform to host all kinds of datasets. Without them we wouldn’t be able to get hold of this dataset and this project wouldn’t have been possible.

**4. ADVANTAGE**

1. Handwritten prescriptions/ health records on paper are bound to be lost occasionally and it’s hard to keep track of all the reports we have. Even if we don’t lose it, things on paper doesn’t last for longer time. Uploading it on the cloud would save us from the trouble of losing it and would keep all our medical records intact.
2. It would be easier for the doctor to analyze our situation, by having access to our past records.
3. Patients would be able to save their money and time, by not standing in lines for ticket. If they want to switch doctors, they will be able to with the help of this. They can make an appointment online if they want to switch doctors rather than standing and waiting for their turn in the ticket counter.

**CONCLUSION**

**FUTURE SCOPE**

1. We aim to make this website used nationwide as we are planning to link with a unique identification number like AADHAR card, PAN card, etc.
2. We will connect it with Google Calendar, to keep patients updated with the timing at which they have to intake the medicine, or upcoming appointments. They will be notified when the time comes.
3. Most of the time, when we visit a hospital, the doctor is not present. We will add a feature which will show us if the doctor is present at the hospital or not. In this way, we will be able to save ourselves from a trip to hospital.

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