MACHINE LEARNING APPROACH TO DETECT & ANNOTATE DISEASES USING RETINAL IMAGGES

2023-162

Status Document II

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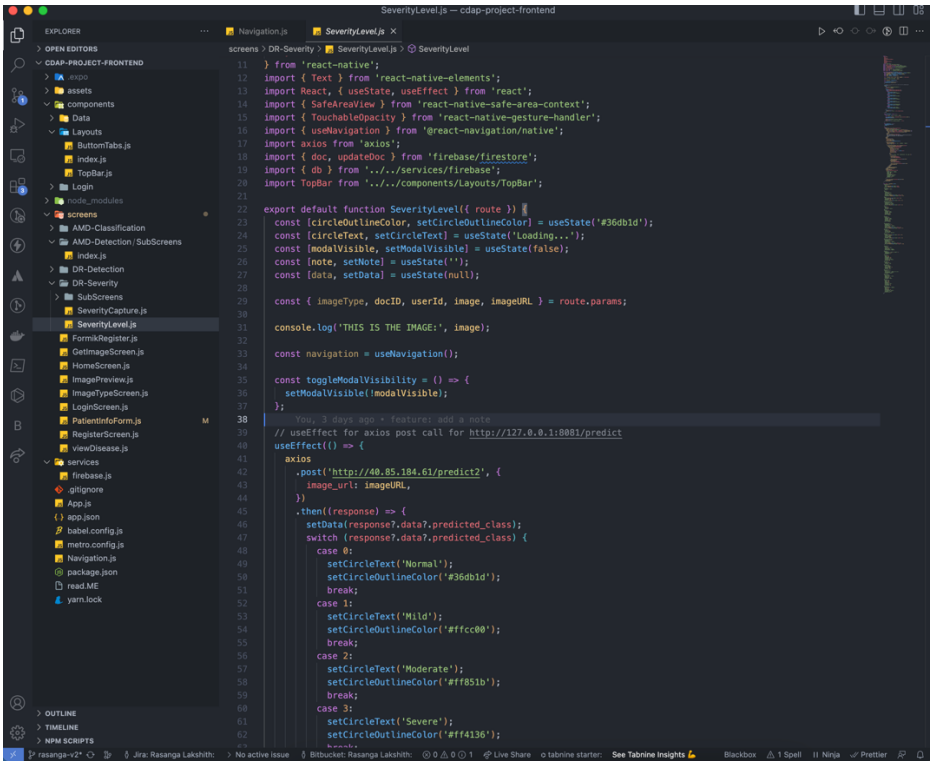
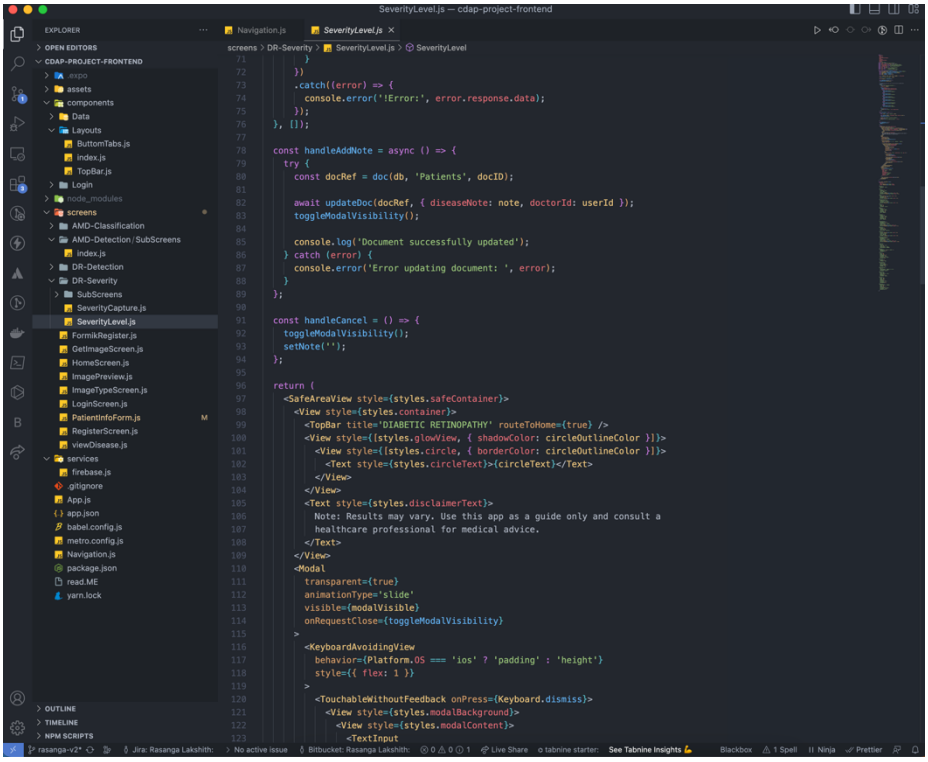


```
} from 'react-native';
import { Text } from 'react-native-elements';
import React, { useState, useEffect } from 'react';
import { SafeAreaView } from 'react-native-safe-area-context';
import { TouchableOpacity } from 'react-native-gesture-handler';
import { useNavigation } from '@react-navigation/native';
import axios from 'axios';
import { doc, updateDoc } from 'firebase/firestore';
import { db } from '../../services/firebase';
import TopBar from '../../components/Layouts/TopBar';

export default function SeverityLevel({ route }) {
  const [circleOutlineColor, setCircleOutlineColor] = useState('#36db1d');
  const [circleText, setCircleText] = useState('Loading...');
  const [modalVisible, setModalVisible] = useState(false);
  const [note, setNote] = useState('');
  const [data, setData] = useState(null);

  const { imageType, docID, userId, image, imageURL } = route.params;

  console.log('THIS IS THE IMAGE:', image);

  const navigation = useNavigation();

  const toggleModalVisibility = () => {
    setModalVisible(!modalVisible);
  };
      You, 3 days ago • feature: add a note
  // useEffect for axios post call for http://127.0.0.1:8081/predict
  useEffect(() => {
    axios
      .post('http://40.85.184.61/predict2', {
        image_url: imageURL,
      })
      .then((response) => {
        setData(response?.data?.predicted_class);
        switch (response?.data?.predicted_class) {
          case 0:
            setCircleText('Normal');
            setCircleOutlineColor('#36db1d');
            break;
          case 1:
            setCircleText('Mild');
            setCircleOutlineColor('#ffcc00');
            break;
          case 2:
            setCircleText('Moderate');
            setCircleOutlineColor('#ff851b');
            break;
          case 3:
            setCircleText('Severe');
            setCircleOutlineColor('#ff4136');
```

Figure 1: Front-end code snip 1



```
        })
        .catch((error) => {
          console.error('!Error:', error.response.data);
        });
    }, []);

  const handleAddNote = async () => {
    try {
      const docRef = doc(db, 'Patients', docID);

      await updateDoc(docRef, { diseaseNote: note, doctorId: userId });
      toggleModalVisibility();

      console.log('Document successfully updated');
    } catch (error) {
      console.error('Error updating document: ', error);
    }
  };

  const handleCancel = () => {
    toggleModalVisibility();
    setNote('');
  };

  return (
    <SafeAreaView style={styles.safeContainer}>
      <View style={styles.container}>
        <TopBar title='DIABETIC RETINOPATHY' routeToHome={true} />
        <View style={[styles.glowView, { shadowColor: circleOutlineColor }]}>
          <View style={[styles.circle, { borderColor: circleOutlineColor }]}>
            <Text style={styles.circleText}>{circleText}</Text>
          </View>
        </View>
        <Text style={styles.disclaimerText}>
          Note: Results may vary. Use this app as a guide only and consult a
          healthcare professional for medical advice.
        </Text>
      </View>
      <Modal
        transparent={true}
        animationType='slide'
        visible={modalVisible}
        onRequestClose={toggleModalVisibility}
      >
        <KeyboardAvoidingView
          behavior={Platform.OS === 'ios' ? 'padding' : 'height'}
          style={{ flex: 1 }}
        >
          <TouchableWithoutFeedback onPress={Keyboard.dismiss}>
            <View style={styles.modalBackground}>
              <View style={styles.modalContent}>
                <TextInput
```

Figure 2: Front-end code snip 2

1.2. Back-end Implementation

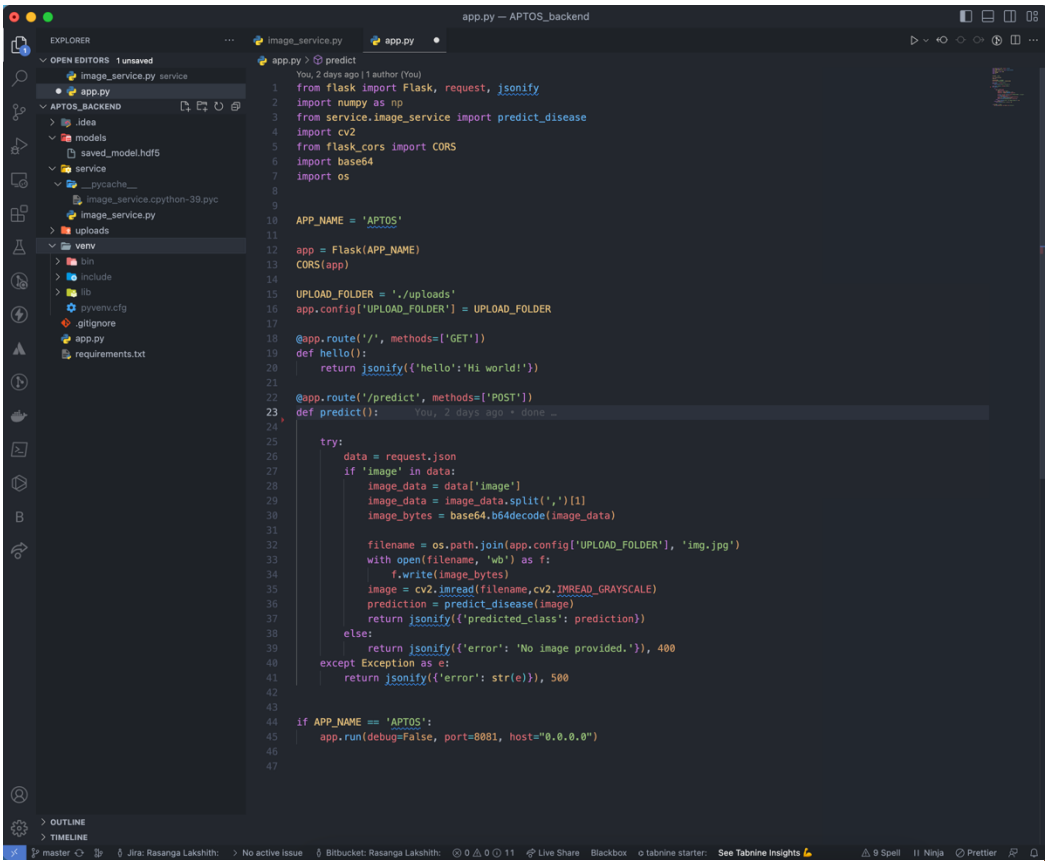


Figure 3: Back-end Flask code

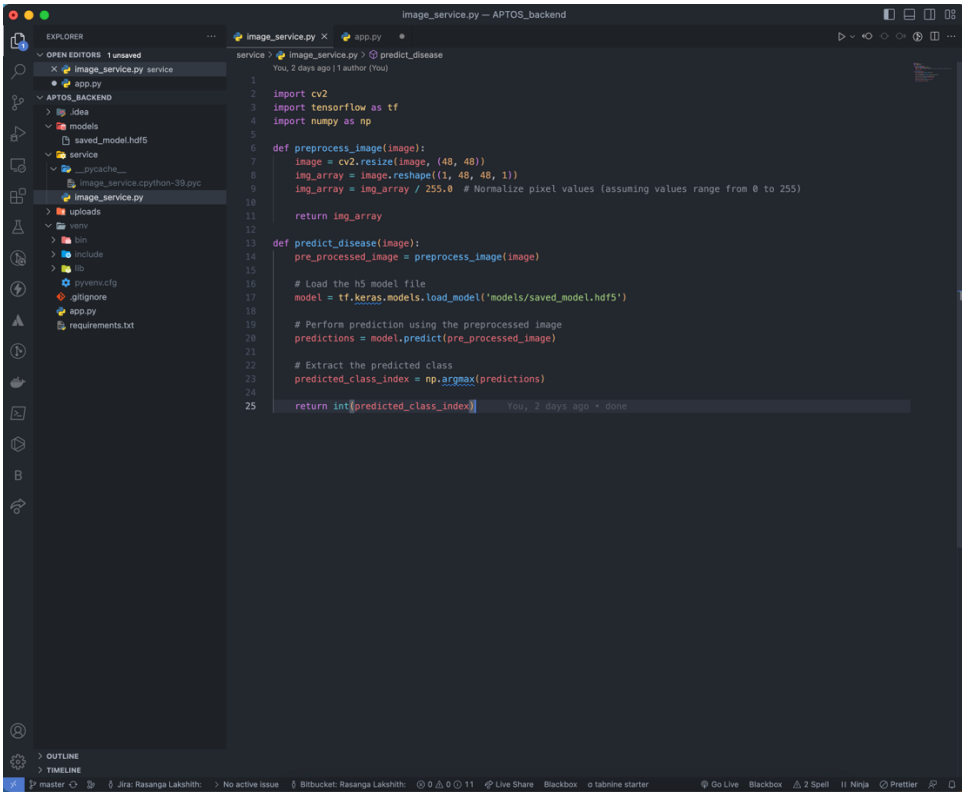


Figure 4: Back-end Service code

```
# model
model = keras.Sequential()

model.add(tf.keras.layers.Conv2D(64, (3,3) , input_shape = (48,48,1) , padding="same"))
model.add(tf.keras.layers.MaxPooling2D((2,2)))

model.add(tf.keras.layers.Conv2D(64, (3,3), padding="same"))
model.add(tf.keras.layers.MaxPooling2D((2,2)))

model.add(tf.keras.layers.Dropout(0.2))

model.add(tf.keras.layers.Flatten())
model.add(tf.keras.layers.Dense(5 , activation = 'softmax'))


model.summary()
```

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 48, 48, 64)        640

 max_pooling2d (MaxPooling2D  (None, 24, 24, 64)       0
 )

 conv2d_1 (Conv2D)           (None, 24, 24, 64)        36928

 max_pooling2d_1 (MaxPooling  (None, 12, 12, 64)       0
 2D)

 dropout (Dropout)           (None, 12, 12, 64)        0

 flatten (Flatten)           (None, 9216)              0

 dense (Dense)               (None, 5)                 46085

=================================================================
Total params: 83,653
Trainable params: 83,653
Non-trainable params: 0
_________________________________________________________________
```

Figure 5: Custom made lightweight model

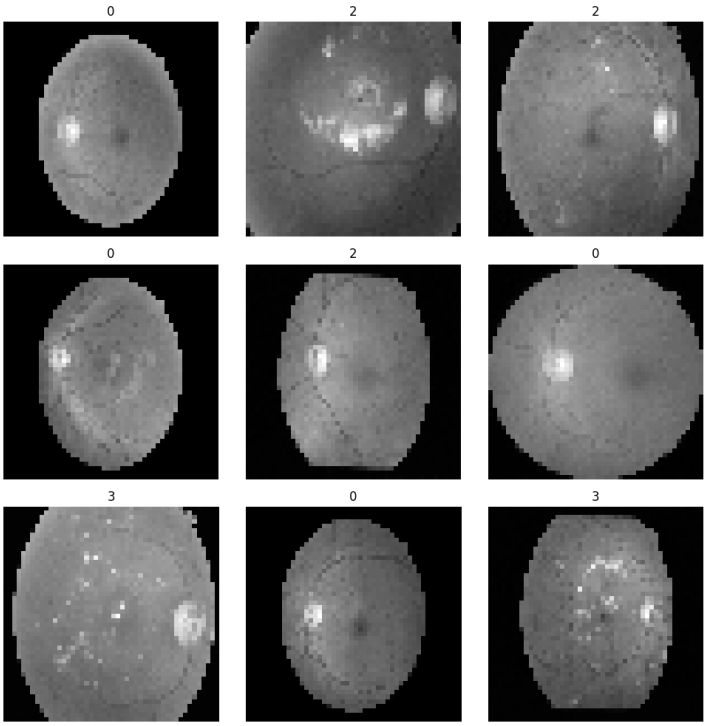
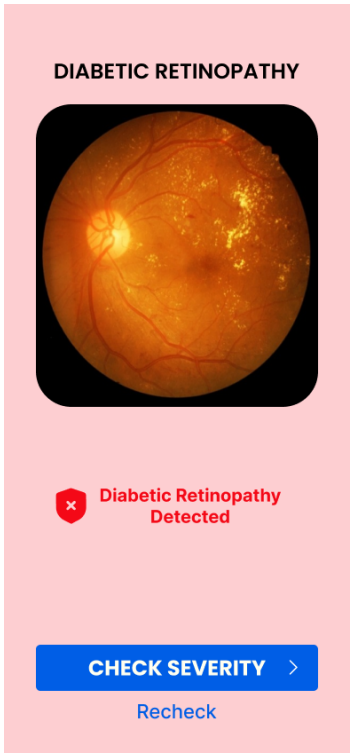
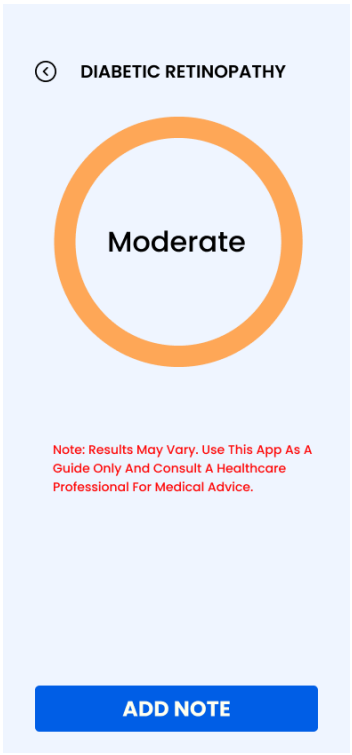
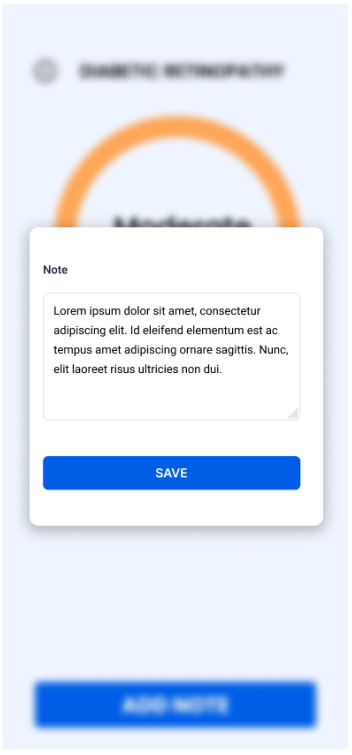


Figure 6: Preprocessed images

1.3. Mobile App UI designs







2. Project view

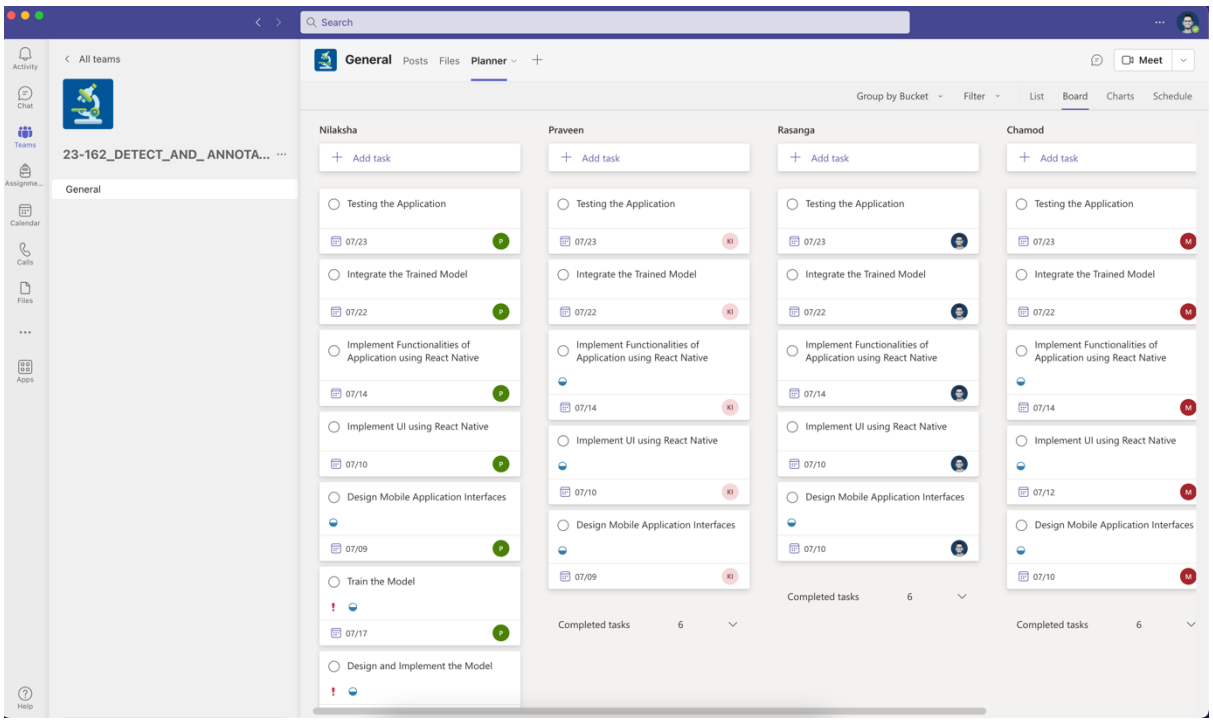


Figure 7: Planner - board view

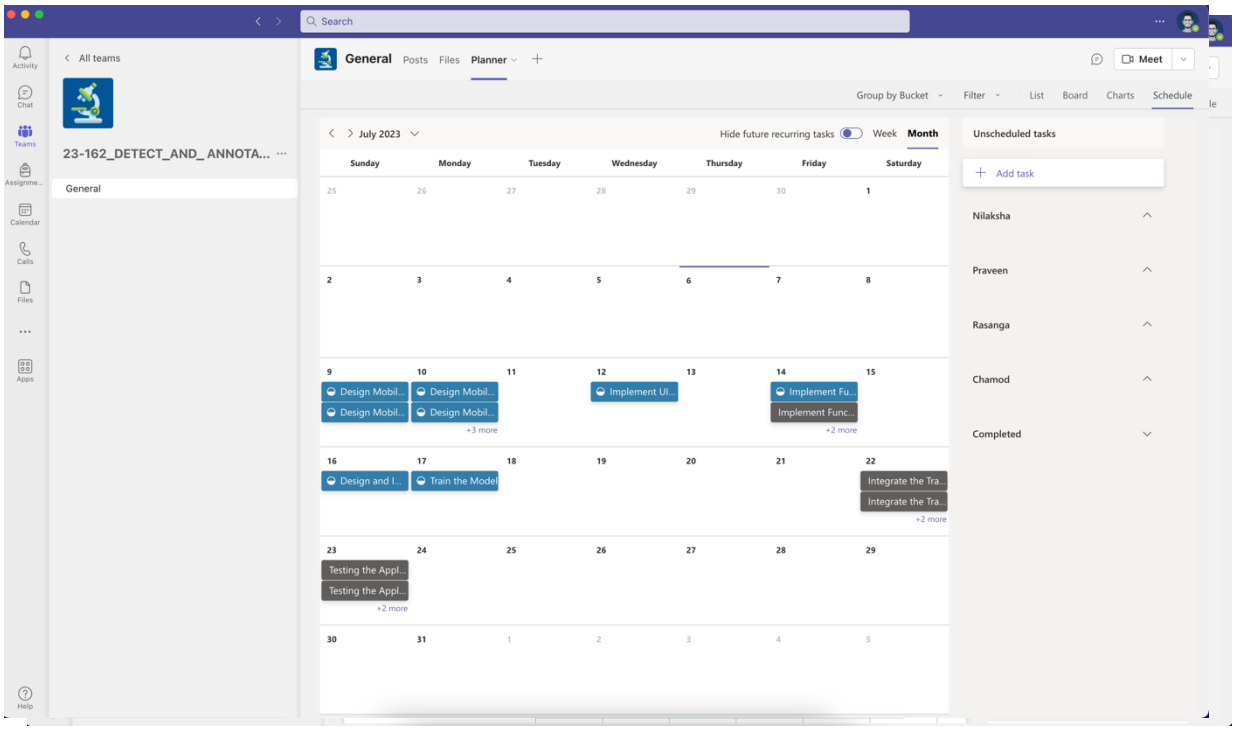


Figure 9: Planner - schedule view

3. Gantt chart

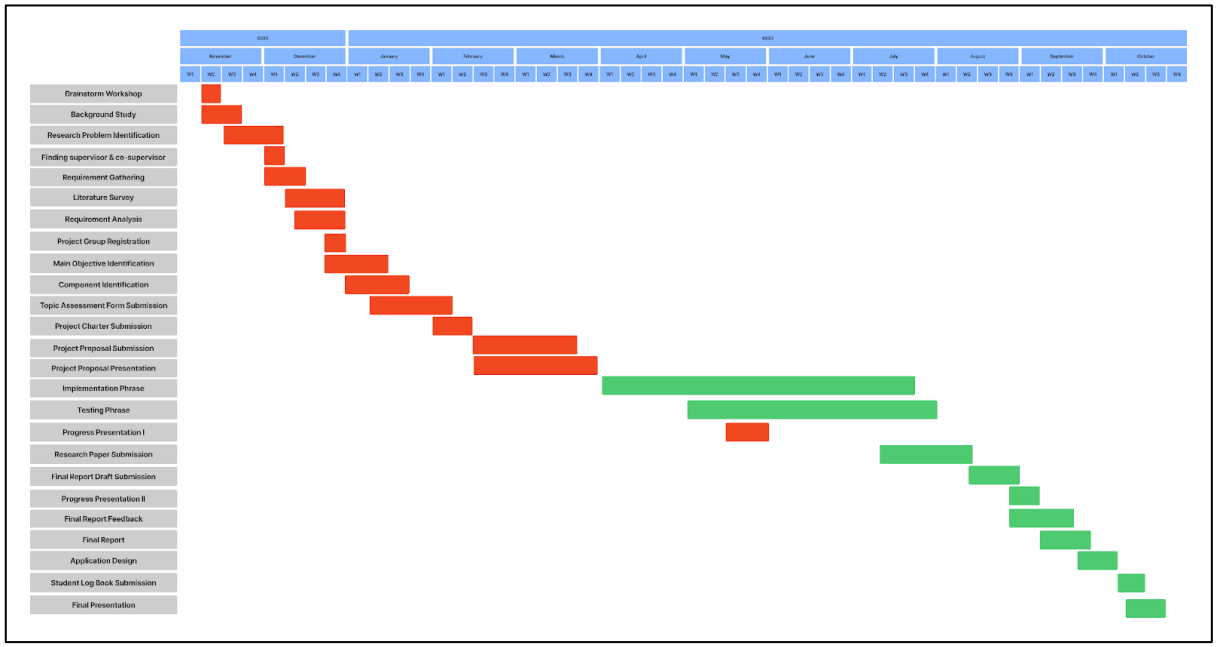
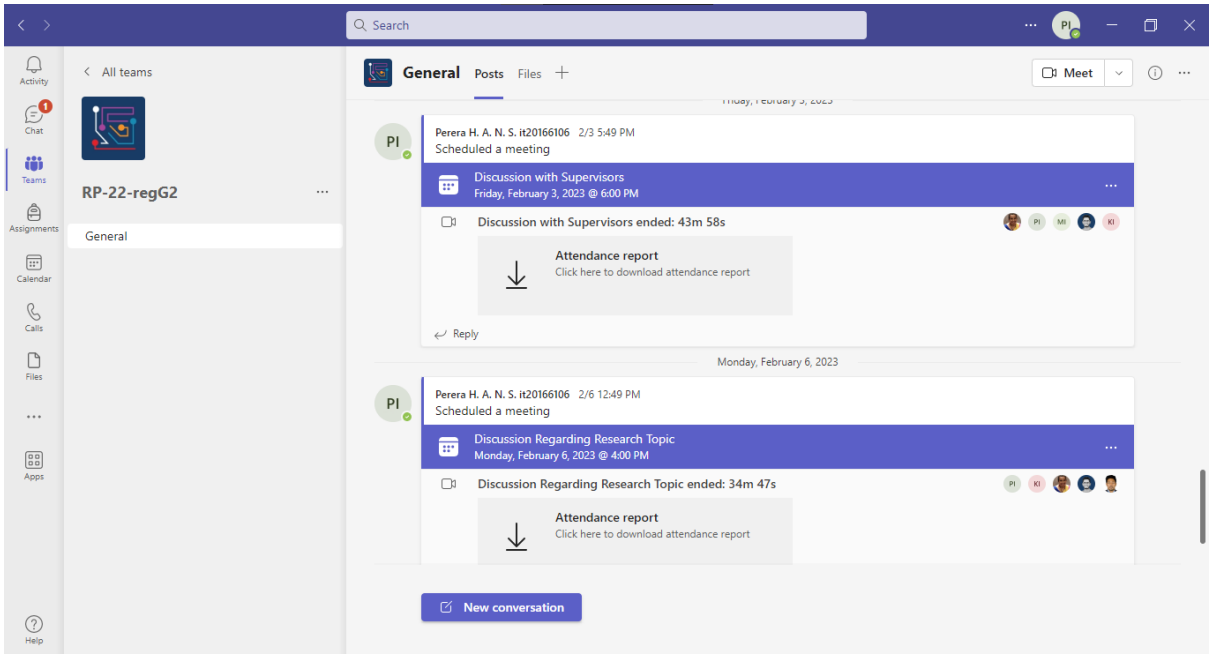
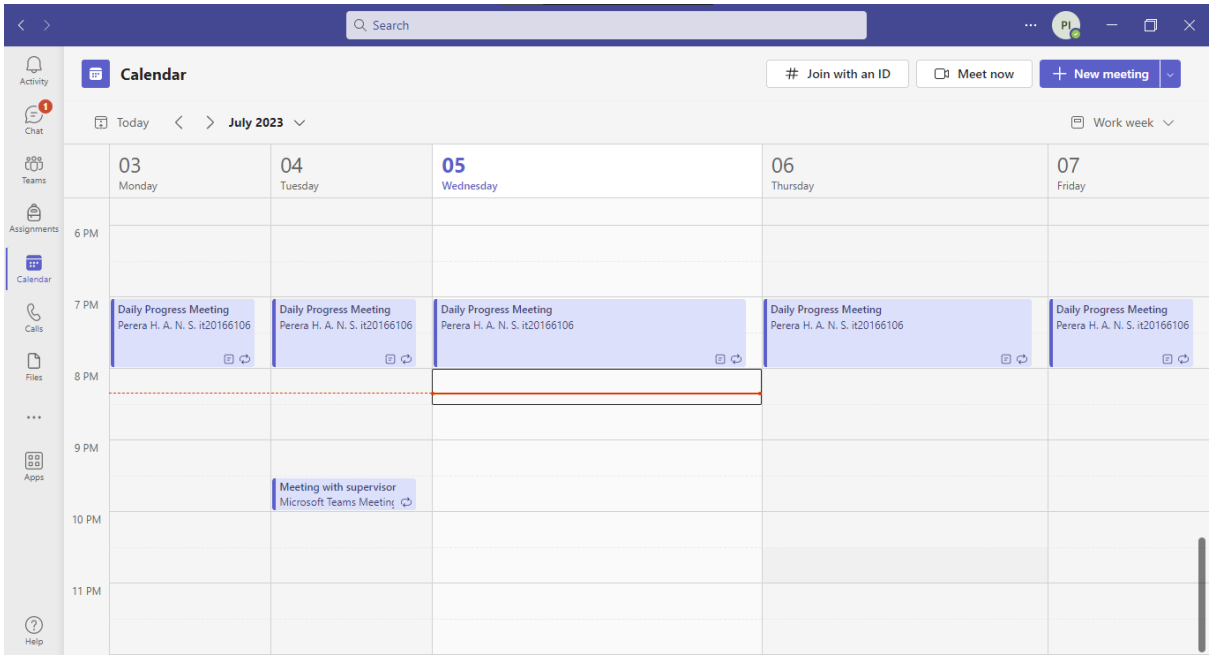
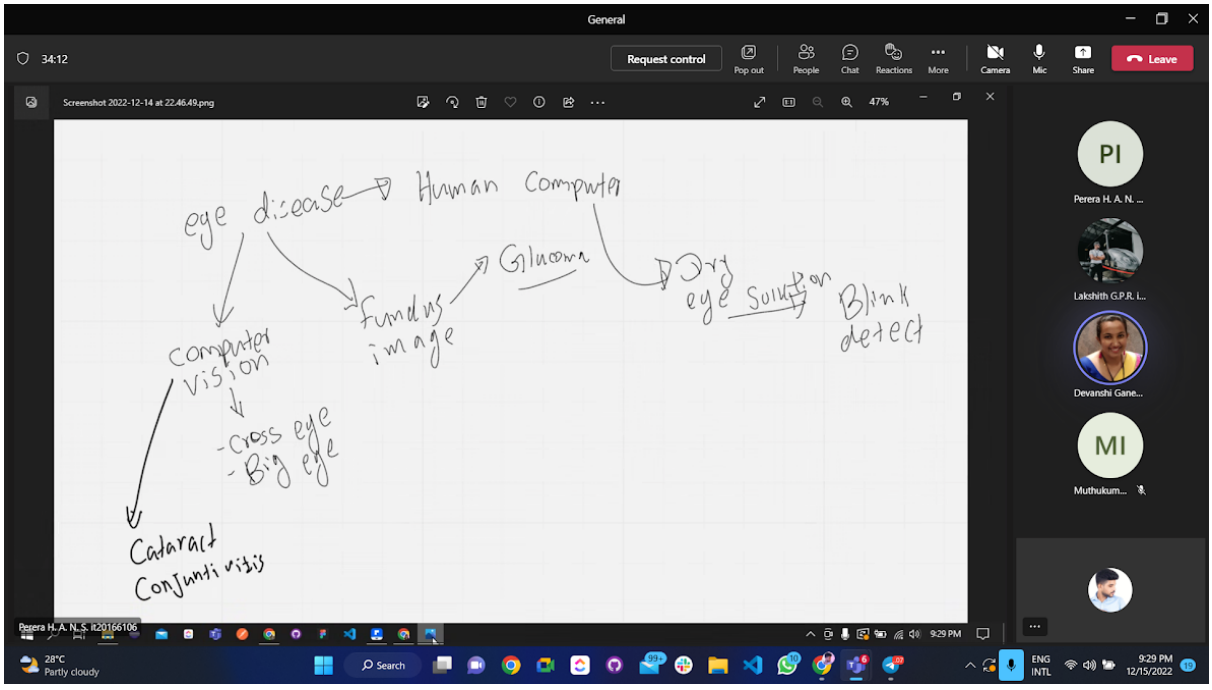


Figure 10: Gantt chart

4. Screenshots of conversations and calls – MS Teams




Search
Calendar
Join with an ID
Meet now
New meeting
Today
July 2023
Work week
03 Monday
04 Tuesday
05 Wednesday
06 Thursday
07 Friday
6 PM
7 PM
8 PM
9 PM
10 PM
11 PM
Daily Progress Meeting
Perera H. A. N. S. it20166106
Meeting with supervisor
Microsoft Teams Meeting
Activity
Chat
Teams
Assignments
Calendar
Calls
Files
Apps
Help


General
34:12
Request control
Pop out
People
Chat
Reactions
More
Camera
Mic
Share
Leave
Screenshot 2022-12-14 at 22.46.49.png
47%
eye disease
Human Computa
Glucoma
funding image
Dry eye
Blink detect
computer vision
- cross eye
- Big eye
Cataract
Conjunti vitis
PI
Perera H. A. N. ...
Lakshith G.P.R. i...
Devanshi Gane...
MI
Muthukum...
Perera H. A. N. S. it20166106
28°C
Partly cloudy
Search
ENG
INTL
9:29 PM
12/15/2022