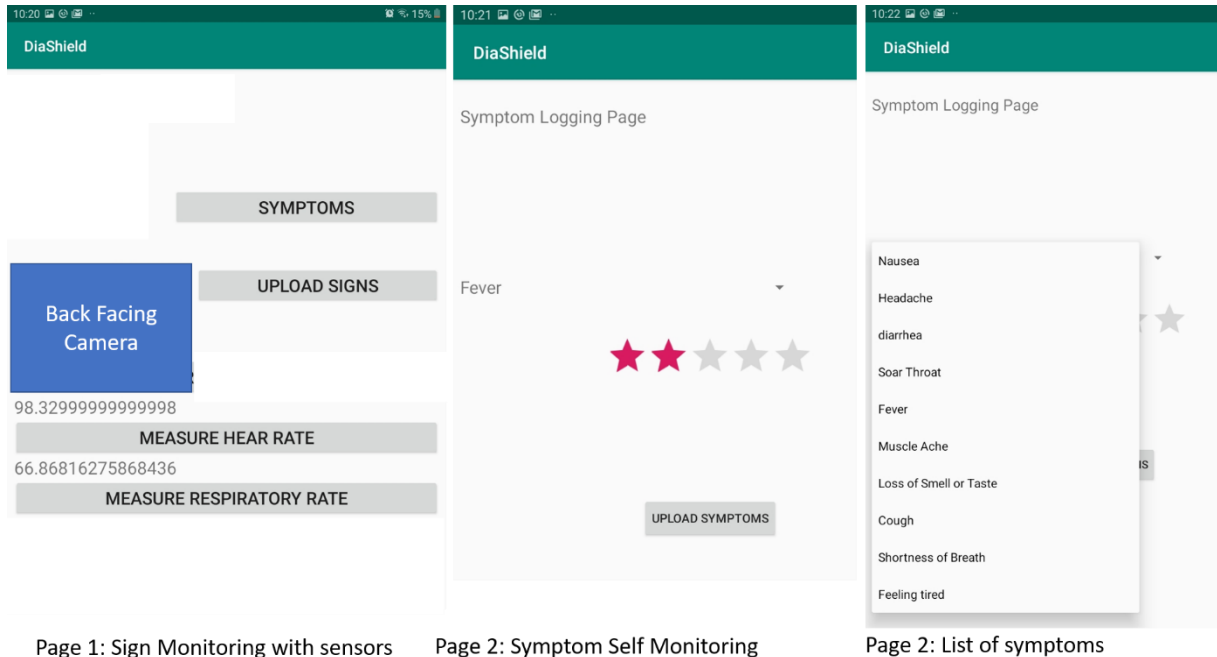


**CSE 535 (Hybrid): Mobile Computing, Fall 2023**  
**Project 1**  
**Due Date 06/09/2023**

**This project will consist of 4 parts:**

1. **Pre-Coding Reading Assigned Paper:** You are required to read the following papers and have a holistic understanding of the research papers.
  - a. [bhealthy: A physiological feedback-based mobile wellness application suite](#)
2. **Coding Assignment:** You are required to build a Context Monitoring Application for the users. A detailed explanation about the requirements of the application is provided in the following pages. **If you are not familiar with Android programming, we recommend watching the videos available in the “Mobile Programming” module section. A helper code is provided for heart rate and respiratory rate data collection.**
3. **Post Coding Reading Assigned Paper:** You are required to read the following papers after completion of your coding assignment and have holistic understanding of the research papers.
  - a. [Health-dev: Model based development pervasive health monitoring systems](#)
4. **Writing Assignment:** You will be asked to answer a certain number of questions based on your understanding of the papers you were assigned to read, the implementation problems that you might have faced during the coding assignment and in class activities. The questions will be subsequently released on canvas.

## Context Monitoring Application (Coding Assignment)



**Figure 1.** Develop an android or iOS application that collects vital information and stores them in a database in the smartphone. It should have two pages as shown in the Figure above.

### OVERVIEW:

#### ACTIVITY 1

The first page should present the user with 2 sign measurement techniques which should be measured and stored in the database.

- Heart Rate Sensing
- Respiratory Rate Sensing.

#### ACTIVITY 2

The second page should collect symptoms data and store it in the database you created earlier.

## ACTIVITY 1

In the first activity it should present the user with two sign measurement techniques: a) heart rate sensing, and b) respiratory rate sensing.

We will use the following methods for each sensing operation.

### Heart rate sensing:

- **Back camera** of the smartphone with **flash enabled**.
- Take a **45 s video** from the back camera with the flash on.
- While taking the video, the user should softly press their index finger on the camera lens while covering the flash light. From the **variation of the red** coloration in the image we will derive the heart rate of the subject.
- **A helper code is provided.**

### Respiratory rate:

- Utilize the **accelerometer or orientation sensor** of the smartphone.
- The user will be asked to lay down and place the smartphone on their chest for a period of **45 seconds**. The respiratory rate will be computed from the accelerometer or orientation data.
- **A helper code is provided.**

## ACTIVITY 2

- Once the user is done collecting signs data, the user will be taken to the second page to collect symptoms data.
- The user will **select a symptom (check figure1 for symptoms list)** and then **select a rating out of 5**.
- The user **does not** need to select all the symptoms. Whichever symptoms the user has not reported will be marked with **0 rating**.
- After this the user will click on the **UPLOAD SYMPTOMS button**.
- At this point a database table entry with **12 entries** will be created and stored in the database in the smartphone.

### Platform:

Android API 29 or greater

You can do it on your smartphone or in android emulator.

You can also do it in iOS but deliverables are a little different. See below.

### You need to submit the following:

- a) **The entire project folder with all code in it and put it in a zip folder. (DO NOT SUBMIT YOUR DATA FILES) .**

- b) Extract the APK (for android/ android emulator) or IPA (for iOS).**
- c) Upload a demo video of your application showing:**
  - i) heart rate collection,**
  - ii) respiratory rate collection,**
  - iii) symptom monitoring and iv) database creation.**