SMART PHONE ACTIVITY MONITOR

A PROJECT REPORT

Submitted by

JAYASURYA K - 311119205020
LOGAVISHWAN S - 311119205030
MANOJ S - 311119205032
ARAVIND R - 311119205301

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ANNA UNIVERSITY: CHENNAI - 600025

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ANNA UNIVERSITY : CHENNAI 600025

BONAFIDE CERTIFICATE

Certified that this project **"SMART PHONE ACTIVITY MONITOR"** is the bonafide work of **JAYASURYA K (311119205020), LOGAVISHWAN S (311119205030), MANOJ S (311119205032)** and **ARAVIND R (311119205301)** who carried out the project work under my supervision.

SIGNATURE	**SIGNATURE**
Dr A JANANI, B.TECH., M.S., Ph.D.,	**Dr. R JULIANA, M.E, Ph.D**
SUPERVISOR	**HEAD OF THE DEPARTMENT**
Associate professor	**Professor**
Information Technology	Information Technology
Loyola-ICAM college of engineering and technology Loyola campus, Nungambakkam,	Loyola-ICAM college of engineering and technology Loyola campus, Nungambakkam,
Chennai-34	Chennai-34

Submitted for the Project Viva Voce examination held on ______________________.

INTERNAL EXAMINER **EXTERNAL EXAMINER**

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ABSTRACT

The modern age calls for exhaustive exposure of kids and teens to social media, society undirection and Communication on various platforms. This scenario equally comes with changes in behavior resulting in the expression of various emotions. There is a critical need especially for kids so that they don't get into depression and stress. In the recent advancements in Video Analytics, the art of feature extraction aids in emotional understanding.

This paper presents a trained ML model to recognise the various emotional expressions of youngsters while using mobile phones. The emotions and the mobile activity of the teenager and youngster are collectively recorded and the corresponding report is sent to the parent/guardian to asses their kid's emotions.

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LIST OF ABBREVIATIONS

S.NO	ACRONYM	ABBREVIATION
1	SPAM	SMART PHONE ACTIVITY MONITOR
2	ML	MACHINE LEARNING
3	AI	ARTIFICIAL INTELLIGENCE
4	GPS	GLOBAL POSITIONING SYSTEM
5	GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
6	IDE	INTEGRATED DEVELOPMENT ENVIRONMENT
7	UI	USER INTERFACE
8	DB	DATABASE

CHAPTER 1

INTRODUCTION

Nowadays, School and College students' suicide rates have increased these days. This is because of a lack of support from their parents and surroundings. A Machine Learning Model that recognises the facial expressions and analyses the emotion of the student and constantly monitors their activities like travel, searching, and app usage and sends them as reports to the person concerned if there occurs any negative activity detection. Our target audience is school and college-going children as well as their parents. We often hear news of students committing suicide nowadays. They lack emotional support. Most parents may not always have a track of their children's emotional aspects. This may be because of their lack of time or their children not being open to them.

A Solution to constantly monitor the children's activities to identify their emotions to direct them on the right path and prevent wrong decisions is needed. So the parents should be made aware of their ward's emotional status and activities. The purpose of this project is to reduce the negative effects of smartphones and direct students/children on the right path. Our project is established to record the student's emotions and determine their stress level. The purpose of this project is also to notify the person concerned if their ward types in or searches for any negative words like 'suicide'.It also provides awareness of the student movement. The locations of students would be tracked and a notification will be sent if they head to a new(strange) location.

1.1 INTRODUCTION TO THE DOMAIN -MACHINE LEARNING:

Machine learning is a field of study and application in computer science and artificial intelligence (AI) that focuses on building algorithms and models that can learn from data and make predictions or decisions without being explicitly programmed.The process of machine learning begins with the collection of relevant data and the selection of an appropriate algorithm or model. The data is then used to train the algorithm or model, which involves adjusting its parameters or weights to minimize the difference between its predictions and the actual outcomes in the training data.Once the model is trained, it can be used to make predictions or decisions on new, unseen data.

This process is known as inference, and it involves applying the learned model to new input data and generating output predictions or decisions.Machine learning has numerous applications across a wide range of domains, including image and speech recognition, natural language processing, predictive analytics, fraud detection, recommendation systems, and autonomous vehicles, among others. The field is constantly evolving, and new techniques and algorithms are being developed to address new challenges and opportunities.

1.2 OVERVIEW OF THE PROJECT

A smartphone activity monitor is a type of app that allows users to track their phone usage and monitor their digital wellness. It provides users with detailed data on their phone usage habits, including screen time, app usage, notifications, and unlock count. This information can be presented in various formats such as graphs, charts, and statistics, enabling users to better understand their phone usage patterns.

Smartphone activity monitors also often come with features to help users manage their phone usage and promote healthy habits, such as setting usage limits and scheduling screen-free time. Overall, a smartphone activity monitor can be a valuable tool for those looking to become more mindful of their phone usage and make positive changes to promote their digital well-being.

1.3 PURPOSE OF THE PROJECT

The purpose of this project is to reduce the negative effects of smartphones and direct students/children on the right path. Our project is established to record the student's emotions and determine their stress level.

The purpose of this project is also to notify the person concerned if their ward types in or searches for any negative words like ‘suicide’. It also provides awareness of the student movement. The locations of students would be tracked and a notification will be sent if they head to a new(strange) location.

1.4 PROJECT PLAN

The project planning stage requires several inputs, including conceptual proposals, project scheles. The development of this project is not successfully done without proper planning and scheduling. Project planning and scheduling is a very important stage for us.

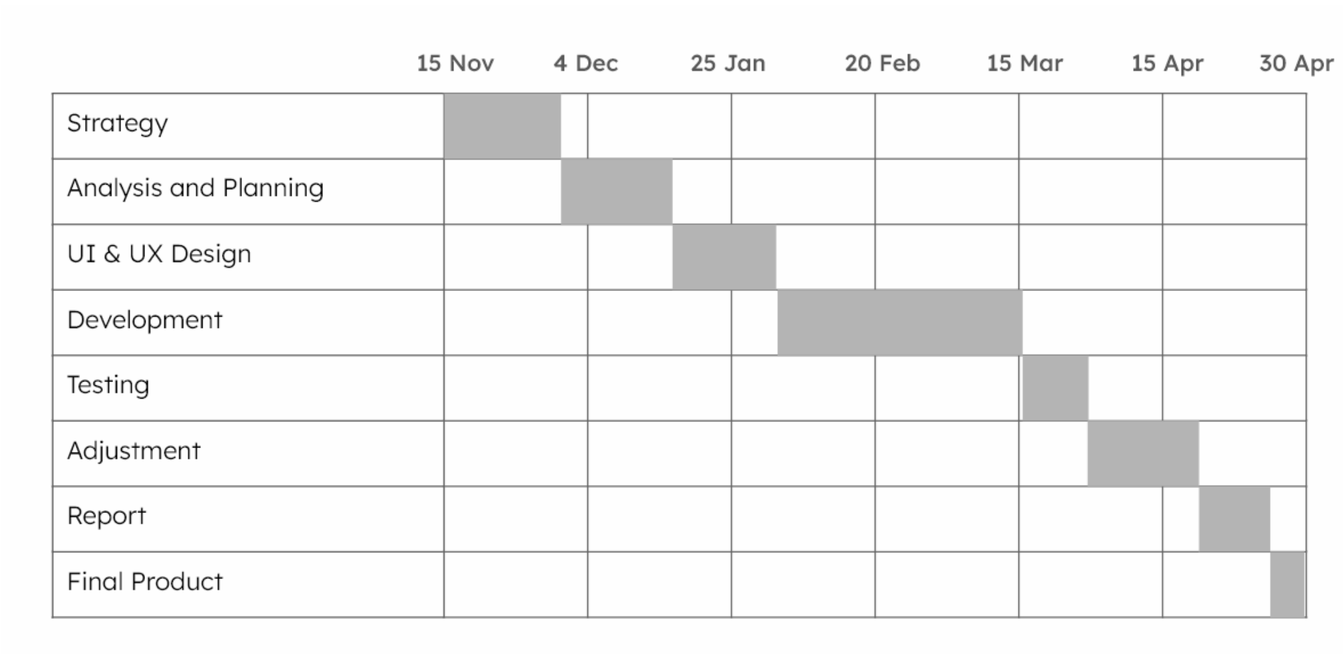

Figure 1.1 – Gantt Chart

UI Designing

The maximum days required for UI design is 10 days.

UI Implementation

The maximum number of days required for UI Implementation is 20 days.

Hardware Implementation

The maximum number of days required for Development is 40 days.

Integration

The maximum number of days required for Integration of all modules is 15 days.

Testing

The maximum days required for testing is 15 days.

1.5 SCOPE OF THE PROJECT

The scope of a project for a smartphone activity monitor for students could include: Developing an app that can monitor a student's activity on their smartphone, including the amount of time spent on different apps and websites. Providing insights into the student's smartphone usage patterns, such as how much time they spend on social media, entertainment apps, and educational apps.Allowing parents and teachers to set limits on how much time a student can spend on their smartphone or specific apps.Providing reports and analytics to parents and teachers about a student's smartphone usage, including trends over time.

Incorporating features that encourage responsible smartphone usage, such as reminders to take breaks or to limit screen time before bed. Ensuring that the app is easy to use and does not interfere with other apps or the normal functioning of the smartphone.Ensuring that the app respects the user's privacy and that their personal data is protected. Overall, the goal of a smartphone activity monitor for students would be to help students develop responsible smartphone usage habits and to give parents and teachers insights into a student's behavior that can help them provide support and guidance.

1.6 SUMMARY

SPAM is a smartphone activity monitor which is a type of app that allows users to track their phone usage and monitor their digital wellness. It provides users with detailed data on their emotions of the person, location monitoring, and phone usage habits, including screen time, app usage, notifications, and unlock count.

CHAPTER 2

LITERATURE SURVEY

This chapter briefly discusses the literature survey done on various projects based on emotions, stress level, keylogger, app usage and location. Their performance uses and limitations are analysed.

2.1 Neutral Face Classification Using Personalized Appearance Models for Fast and Robust Emotion Detection

Authors: Pojala Chiranjeevi, Viswanath Gopalakrishnan, Pratibha Moogi
Published in: IEEE TRANSACTIONS ON IMAGE PROCESSING
Date of Conference: SEPTEMBER 2019

This was personalized Appearance Model Construction which involves constructing personalized appearance models from individual facial expressions. The approach utilizes a deep CNN to learn these models, which capture subtle variations in facial features that are indicative of emotional states. The CNN is trained on a small set of labelled examples for each individual. Emotion Classification the neutral face is classified into one of several emotional categories. The approach uses the personalized appearance models learned in the first step to extract features from the neutral face. These features are then fed into a classifier, such as a support vector machine (SVM), which predicts the emotional category of the neutral face

Cons: *Detects neutral state to bypass those frames from emotion classification.*

2.2 A Deep Learning Approach for Real Time Facial Emotion Recognition

Authors: Rupali Gill, Jaiteg Singh
Published in: 10th International Conference on System Modeling & Advancement in Research Trends (SMART)
Date of Conference: 2021

This paper proposes an approach for recognizing facial actions and their temporal segments from face profile image sequences. The approach utilizes a combination of appearance and motion features extracted from the image sequences to improve recognition accuracy. The proposed approach is evaluated on two publicly available datasets, and the results demonstrate its effectiveness in recognizing facial actions and their temporal segments. The authors also compare their approach to existing methods and show that their approach outperforms these methods in terms of recognition accuracy.

Cons: *The proposed model has attained better accuracy.*

2.3 An Improved Classification Model for Depression Detection Using EEG and Eye Tracking Data

Authors: Jing Zhu , Zihan Wang, Tao Gong,Shuai Zeng, Xiaowei Li , Bin Hu , Jianxiu Li, Shuting Sun and Lan Zhang.
Published in: IEEE TRANSACTIONS ON NANOBIOSCIENCE, VOL. 19, NO. 3
Date of Conference: JULY 2020

This paper proposes an approach for detecting depression using electroencephalography (EEG) and eye-tracking data. The approach utilizes a combination of feature extraction techniques and machine learning algorithms to improve classification accuracy. The approach consists of three main steps: data preprocessing, feature extraction, and classification. In the first step, the EEG and eye tracking data are preprocessed to remove noise and artifacts. In the second step, a set of features is extracted from the preprocessed data using techniques such as wavelet decomposition and spectral analysis. In the third step, a machine learning algorithm, such as a support vector machine (SVM), is used to classify the data into depressed and non-depressed groups.

Cons: *Has a better depression detection accuracy in both EMs and EEG.*

2.4 Facial Depression Recognition by Deep Joint Label Distribution and Metric Learning

Authors: Xiuzhuang Zhou, Zeqiang Wei, Min Xu, Shan Qu, Guodong Guo.
Published in: IEEE Transactions on Affective Computing, Volume: 13, Issue: 3,01
Date of Conference: July-Sept. 2022

This paper proposes an approach for recognizing depression from facial images using deep joint label distribution and metric learning. The approach utilizes a convolutional neural network (CNN) to extract features from facial images and a metric learning algorithm to improve the separability of features between depressed and non-depressed groups. The approach consists of two main steps: feature extraction and metric learning. In the first step, a pre-trained CNN is fine-tuned on a dataset of facial images labeled with depression status. The output of the CNN is a set of high-dimensional feature vectors that capture the relevant information for depression recognition. In the second step, a metric learning algorithm is used to learn a mapping from the high-dimensional feature space to a lower-dimensional feature space that maximizes the separability between depressed and non-depressed groups.

Cons: *The learning modules in DJ-LDML work collaboratively to enhance the robustness of our prediction model.*

2.5 Autonomous Management of Everyday Places for a Personalized Location Provider

Authors: Yohan Chon, Elmurod Talipov, and Hojung Cha
Published in: IEEE TRANSACTIONS ON SYSTEMS, MAN, AND CYBERNETICS—PART C :APPLICATIONS AND REVIEWS
Date of Conference: July 2018

This paper proposes an approach for autonomous management of everyday places to provide personalized location-based services. The approach utilizes a combination of crowd-sourcing, semantic web technologies, and machine learning algorithms to automatically infer the semantics of everyday places and provide personalized recommendations to users. The approach consists of three main steps: data collection, semantic representation, and personalized recommendation. In the first step, user-generated data on the semantics of everyday places is collected using a mobile application. In the second step, the collected data is represented using ontologies and linked data to enable semantic reasoning. In the third step, a machine learning algorithm is used to provide personalized recommendations to users based on their preferences and the semantics of everyday places.

Cons: *Each user constructs his/her own POI map incrementally without a centralized server.*

2.6 Modeling and Improving the Energy Performance of GPS Receivers for Location Services

Authors: Kong yang Chen , Guang Tan , Jiannong Cao,Mingming Lu and Xiaopeng Fan
Published in:IEEE SENSORS JOURNAL, VOL. 20, NO. 8
Date of Conference:APRIL 15, 2020

This paper proposes an approach for modeling and improving the energy performance of GPS receivers in location-based services. The approach utilizes a combination of data collection, statistical analysis, and machine learning algorithms to model the energy consumption of GPS receivers and identify opportunities for energy savings. The approach consists of three main steps: data collection, statistical analysis, and machine learning. In the first step, energy consumption data is collected from GPS receivers in a variety of scenarios, such as different locations, speeds, and weather conditions. In the second step, statistical analysis is used to identify the factors that affect the GPS receiver's energy consumption, such as signal strength, satellite visibility, and hardware specifications. In the third step, a machine learning algorithm is used to model the energy consumption of GPS receivers and identify opportunities for energy savings, such as optimizing the use of GPS receivers in low signal strength environments or reducing the sampling rate of GPS data.

Cons: *This paper uses the GPS to reduce the energy consumption by avoiding unnecessary satellite processing.*

2.7 Modeling and Improving the Energy Performance of GPS Receivers for Location Services

Authors: Francisco Moreno, Silvia Uribe, Federico Alvarezb and Jose Manuel Menendez.
Published in:IEEE Consumer Electronics Magazine (Volume: 9, Issue: 2)
Date of Conference:01 March 2020

This paper proposes an approach for using aspect-oriented programming to dynamically detect user activities in mobile app analytics. The approach extends the traditional aspect-oriented programming paradigm by incorporating dynamic analysis techniques to improve the accuracy and flexibility of activity detection. The approach consists of two main steps: aspect specification and dynamic analysis. In the first step, the user activities to be detected are specified as aspects in the aspect-oriented programming paradigm. In the second step, dynamic analysis techniques are used to identify and monitor the execution of the specified aspects at runtime.

Cons: *This approach uses In-App Usage management without using any third-party libraries by exchanging few JSON files*

2.8 To What Extent We Repeat Ourselves? Discovering Daily Activity Patterns Across Mobile App Usage

Authors: Tong Li , Yong Li , Mohammad Ashraful Hoque.
Tong Xia, Sasu Tarkoma and Pan Hui.
Published in:IEEE TRANSACTIONS ON MOBILE COMPUTING, VOL. 21, NO. 4
Date of Conference:APRIL 2022

This paper proposes an approach for discovering daily activity patterns across mobile app usage. The approach utilizes a combination of data mining and machine learning techniques to extract and analyze the temporal and contextual information of user activities in mobile apps. The approach consists of three main steps: data collection, feature extraction, and pattern discovery. In the first step, user activity data is collected from mobile devices using a custom mobile app. In the second step, contextual and temporal features are extracted from the user activity data, such as time of day, app usage frequency, and app category. In the third step, machine learning algorithms are used to discover daily activity patterns in the user data, such as recurrent app usage sequences or app category transitions.

Cons: *The approach mainly concentrates on the amount of time the user repeats his/her daily activities by analysing the app usage.*

2.9 Unprivileged Black-Box Detection of User-Space Keyloggers

Authors: Stefano Ortolani, Cristiano Giuffrida, and Bruno Crispo
Published in: IEEE TRANSACTIONS ON DEPENDABLE AND SECURE COMPUTING
Date of Conference: JANUARY/FEBRUARY 2020

In this work, they proposes an approach for detecting user-space keyloggers, which are a type of malware that can capture and record keystrokes made by a user on a computer. The proposed approach utilizes a machine learning-based method to detect the presence of keyloggers in a black-box fashion, without requiring any special privileges or access to the operating system. The approach consists of three main steps: data collection, feature extraction, and classification. In the first step, user input data is collected from a variety of sources, such as a keyboard, mouse, or touchpad. In the second step, a set of behavioral features is extracted from the user input data, such as the time between keystrokes or the frequency of specific key combinations. In the third step, a machine learning algorithm is trained to classify the input data as either normal user input or input from a keylogger.

Cons: *An unprivileged black-box approach for accurate detection of the most common keyloggers*

2.10 An Indirect Eavesdropping Attack of Keystrokes on Touch Screen through Acoustic Sensing

Authors: Stefano Ortolani, Cristiano Giuffrida, and Bruno Crispo
Published in: IEEE TRANSACTIONS ON MOBILE COMPUTING,
VOL. 20, NO. 2,
Date of Conference: FEBRUARY 2021

In this work, they proposes an approach for an indirect eavesdropping attack on touchscreen keystrokes through acoustic sensing. The approach utilizes the acoustic signals generated by the tap of a user's finger on a touch screen to infer the location and identity of the keystrokes, enabling an attacker to eavesdrop on the user's inputs. The proposed approach consists of three main steps: data collection, feature extraction, and keystroke inference. In the first step, acoustic signals are collected using a microphone located near the touch screen. In the second step, features are extracted from the acoustic signals, such as the duration and frequency of taps. In the third step, machine learning algorithms are used to infer the location and identity of the keystrokes based on the extracted features.

Cons: *Better Accuracy in keystroke by acoustic signals like sounds waves and also uses finger movements.*

2.11 SUMMARY

This Research paper helps to do the specific feature separately. we build an application which helps to help the parents to monitor their child with the SPAM(Smart Phone Activity Monitor) by enabling the necessity permissions in the childs mobilephone.

CHAPTER 3

SYSTEM ANALYSIS AND DESIGN

3.1 PROBLEM DEFINITION

The problem is that students spend a significant amount of time on their smartphones, which can negatively impact their academic performance, health, and well-being. There is a need for a smartphone activity monitor for students that can track and analyze their smartphone usage patterns, and provide insights and recommendations to help them better manage their time, reduce distractions, and improve their productivity.

3.2 NEED ANALYSIS

The Bull Diagram describes the purpose of the System and about all the Actors who are involved in the system.

3.2.1 BULL DIAGRAM

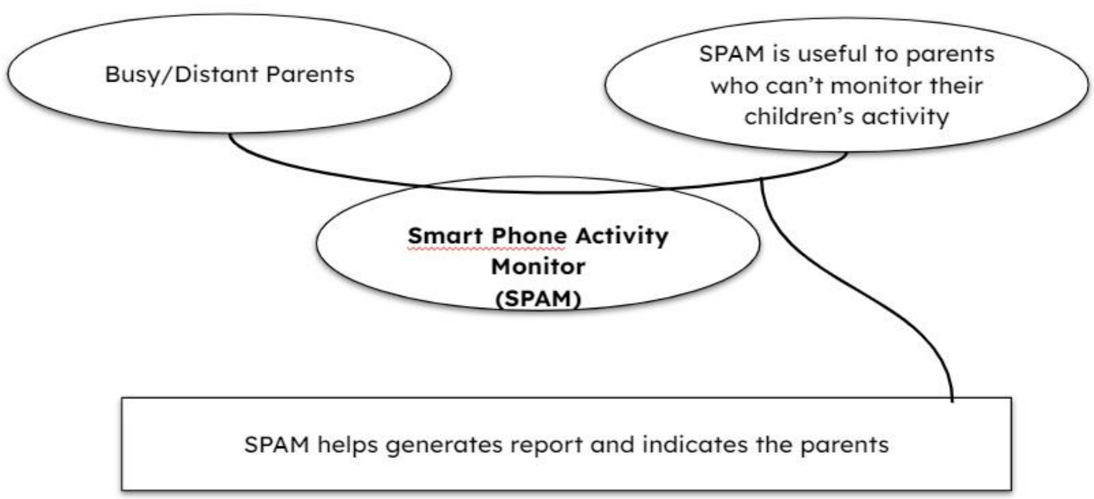

Figure 3.1 – Bull Diagram

3.3 FUNCTIONAL ANALYSIS

The Octopus Diagram describes the functionalities involved in a system. The principle functions specify the primary functionalities that must be provided by the system. The constraint functions are those, which on satisfying the users will provide additional credits to the system or product developed.

3.3.1 OCTOPUS DIAGRAM

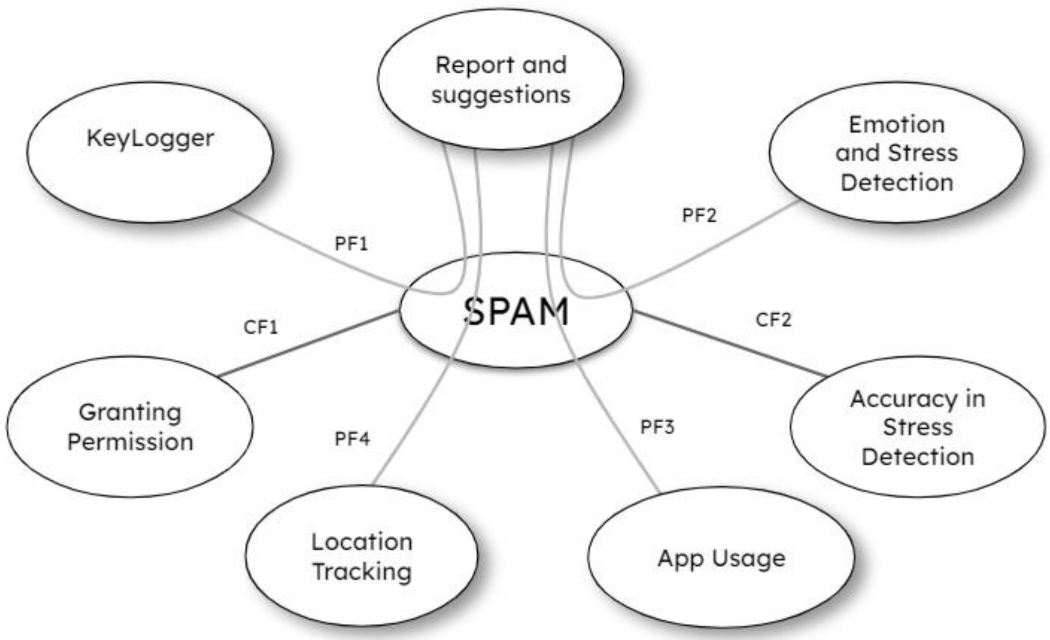

Figure 3.2 – Octopus Diagram

3.4 DATA FLOW DIAGRAM

A Data Flow Diagram (DFD) is a graphical representation of the "flow" of data through an information system, modelling its process aspects. DFDs can also be used for the visualization of data processing. A DFD shows what kind of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored.

3.4.1 DFD-0

DFD 0 is designed to be an abstraction view, showing the system as a single process with its relationship to external entities.

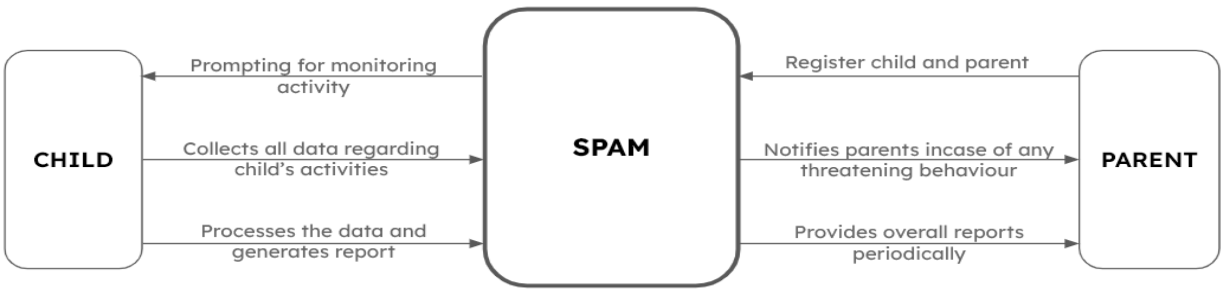

Figure 3.3 – DFD 0

3.4.2 DFD-1

DFD 1 is used to highlight the main functions of the system and break down the high- level process of 0-level DFD into subprocesses.

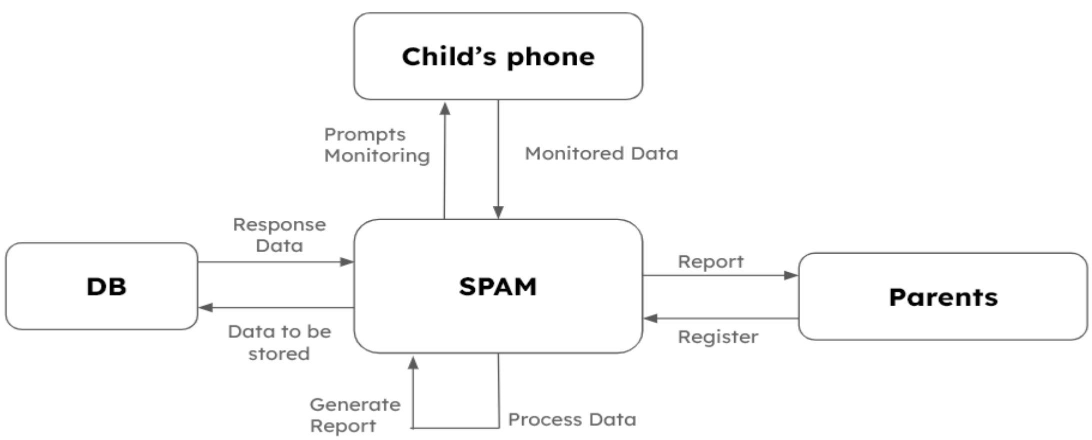

Figure 3.4 – DFD 1

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3.4.3 DFD-2

DFD 2 is used to plan or record the specific/necessary detail about the system's functioning.

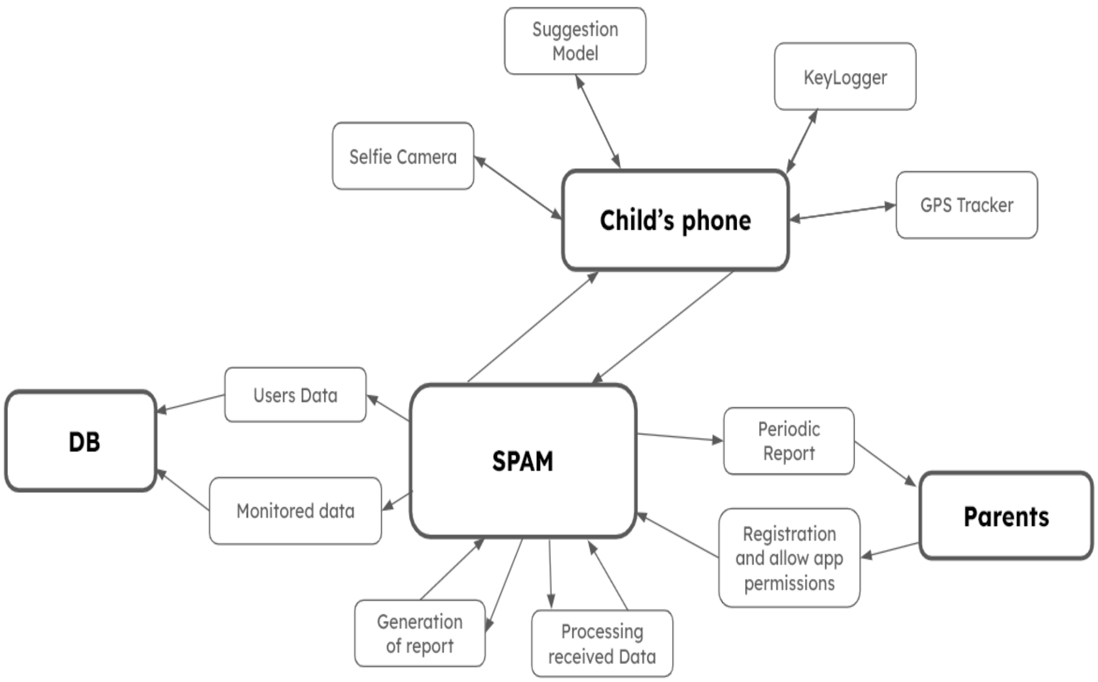

Figure 3.5 – DFD 2

3.5 UML DIAGRAM

UML diagrams are drafted below with the purpose of visually representing a system along with its main actors, roles, actions, artifacts or classes, in order to better understand, alter, maintain, or document information about the 'SMART PHONE ACTIVITY MONITOR'.

3.5.1 USE CASE DIAGRAM

A Use Case Diagram is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved.

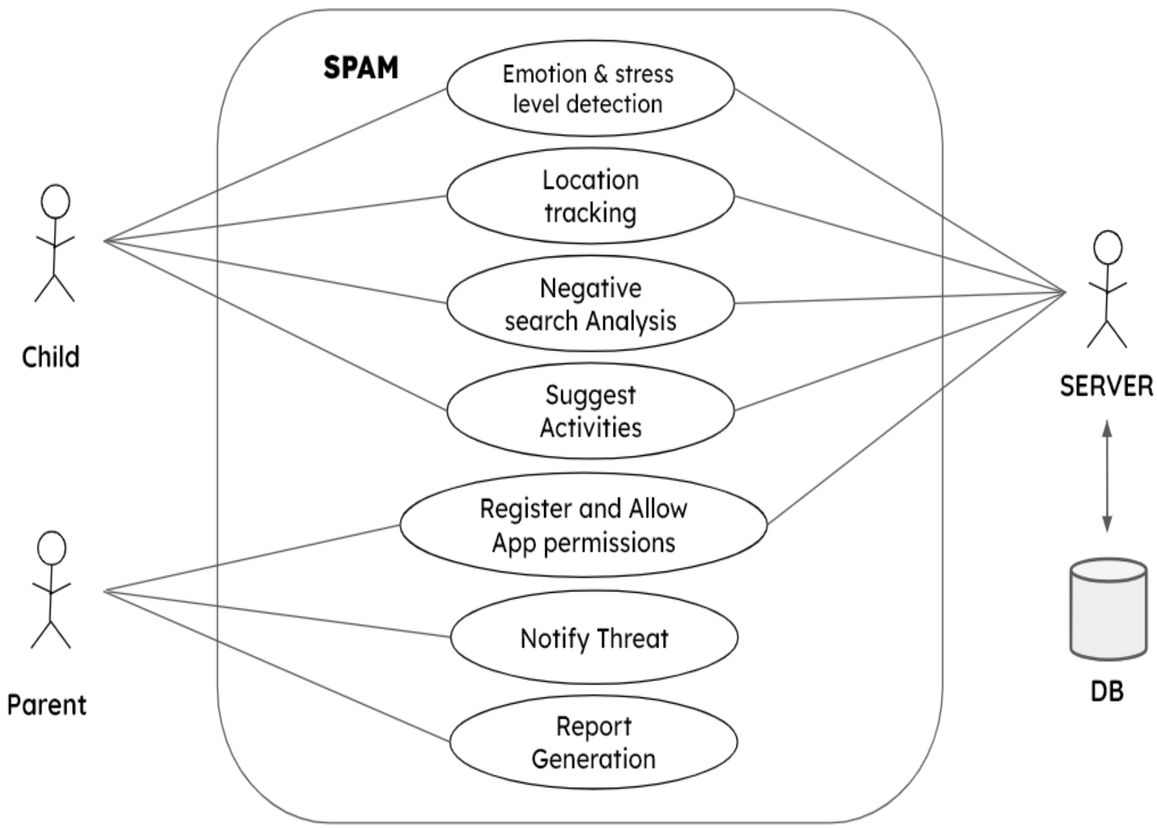

Figure 3.6 – Use Case Diagram

3.5.2 CLASS DIAGRAM

A Class Diagram is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

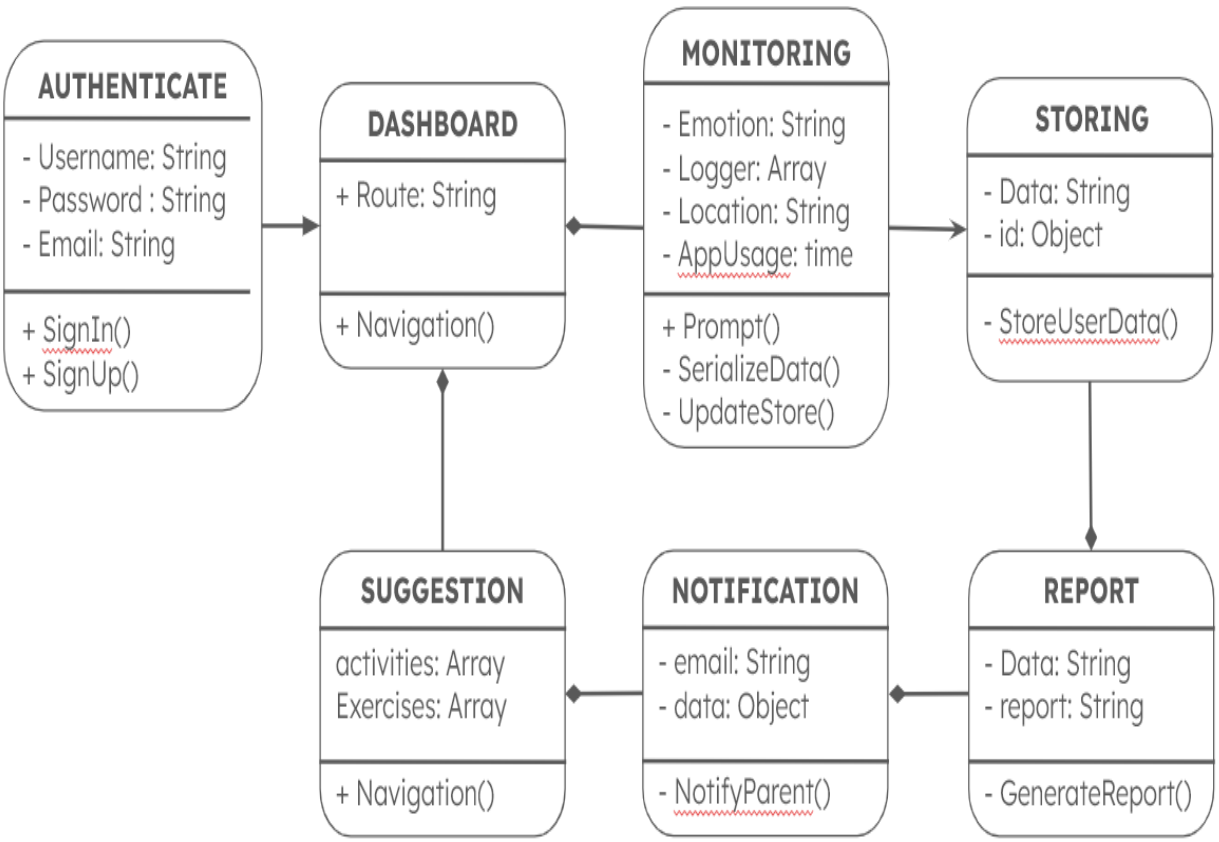

Figure 3.7 – Class Diagram

3.5.3 SEQUENCE DIAGRAM

A Sequence Diagram shows object interactions arranged in time sequence. It depicts the sequence of messages exchanged between the objects to carry out the functionality of the scenario.

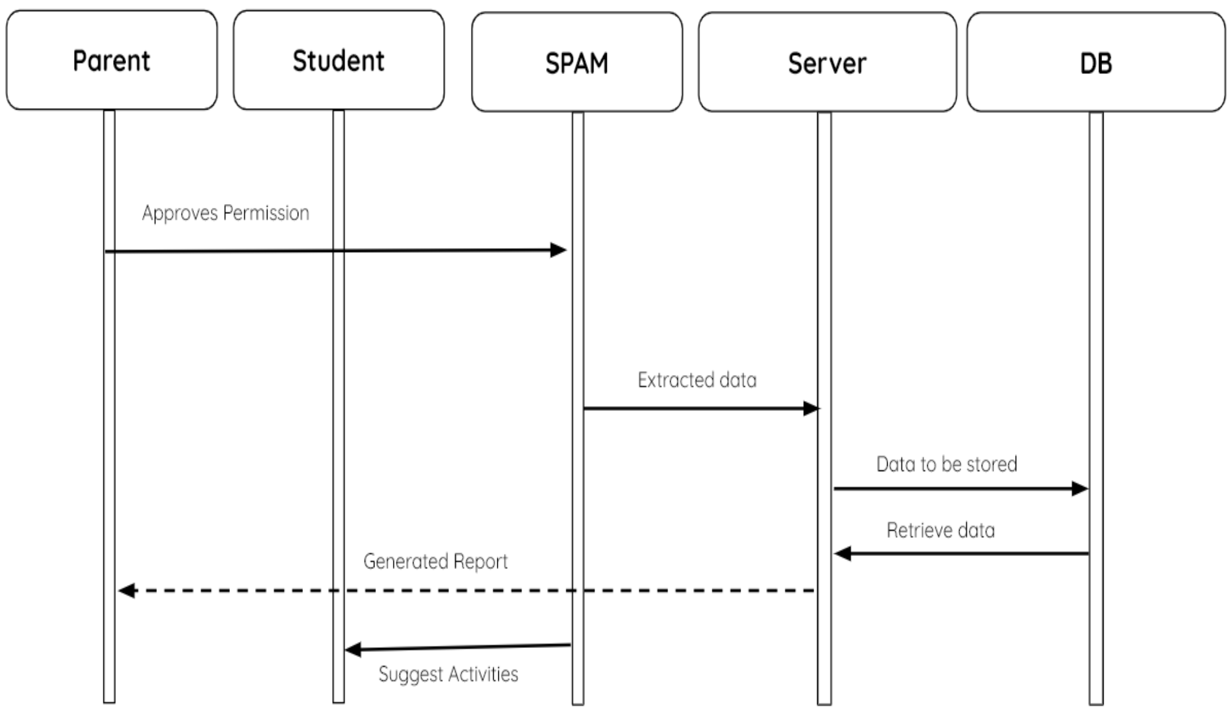

Figure 3.8 – Sequence Diagram

3.5.4 COLLABORATION DIAGRAM

A Collaboration Diagram models the interactions between objects or parts in terms of sequenced messages.

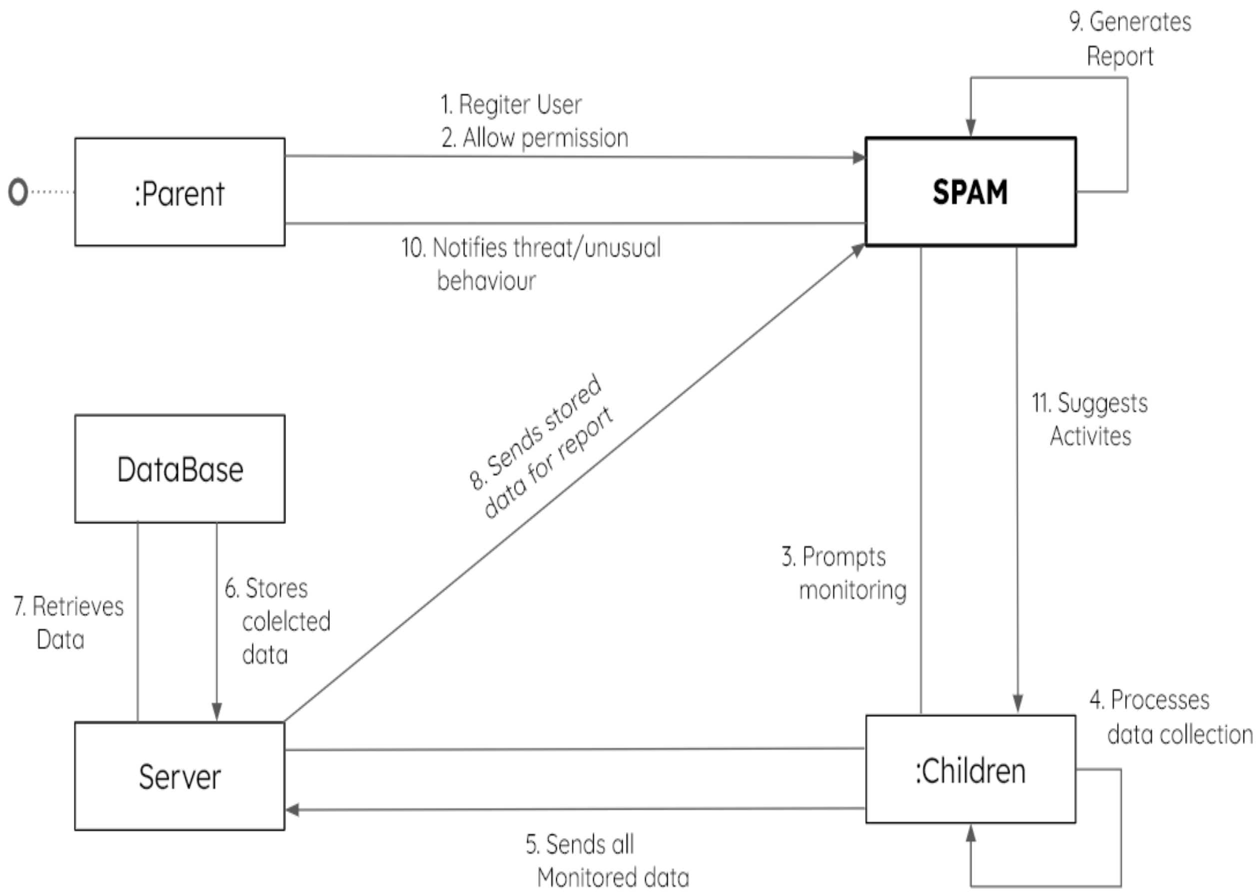

Figure 3.9 – Collaboration Diagram

3.5.5 STATE CHART DIAGRAM

A State Diagram shows the behaviour of classes in response to external stimuli. Specifically, it describes the behaviour of a single object in response to a series of events in a system.

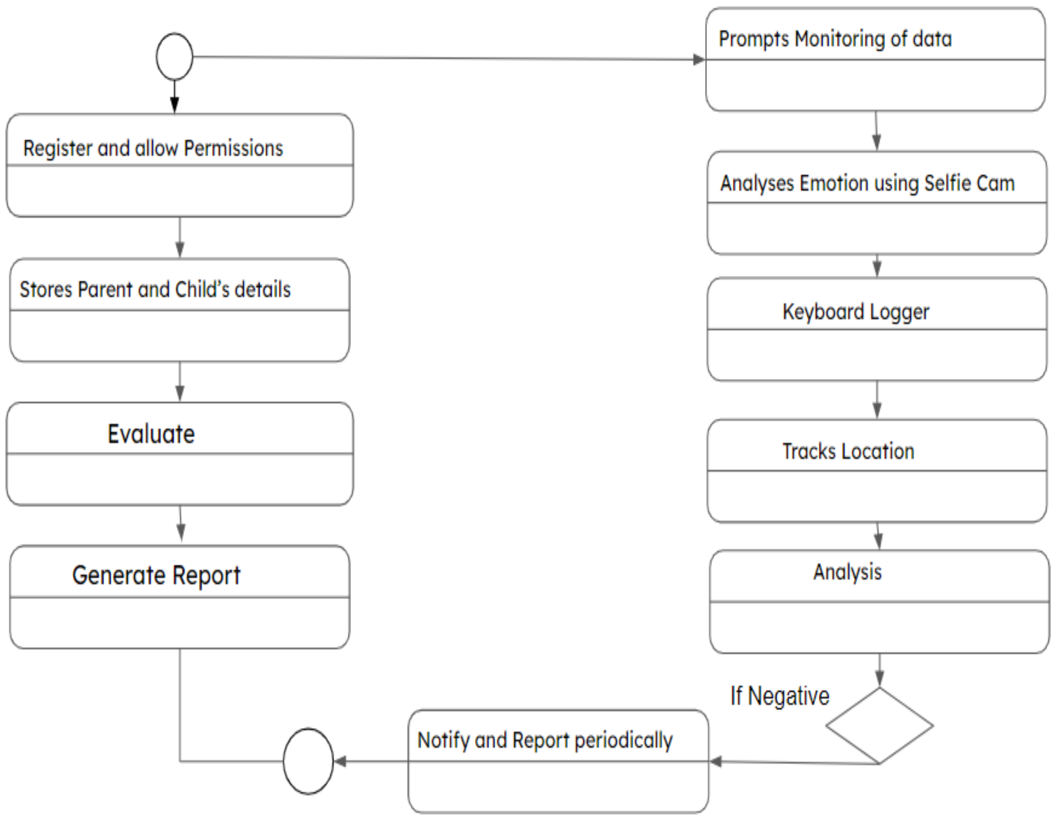

Figure 3.10 – State Chart Diagram

3.5.6 ACTIVITY DIAGRAM

Activity Diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency.

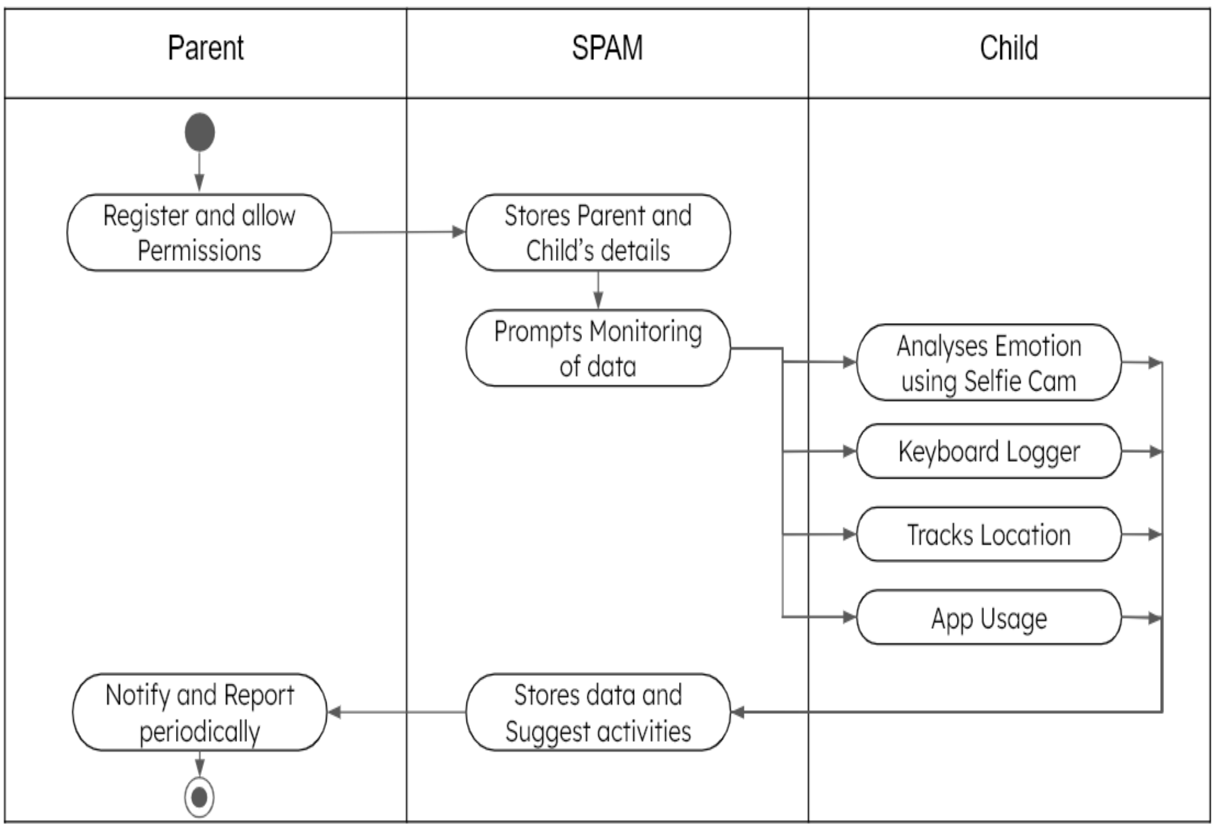

Figure 3.11 – Activity Diagram

3.5.7 COMPONENT DIAGRAM

A Component Diagram depicts how components are wired together to form larger components or software systems. They are used to illustrate the structure of arbitrarily complex systems.

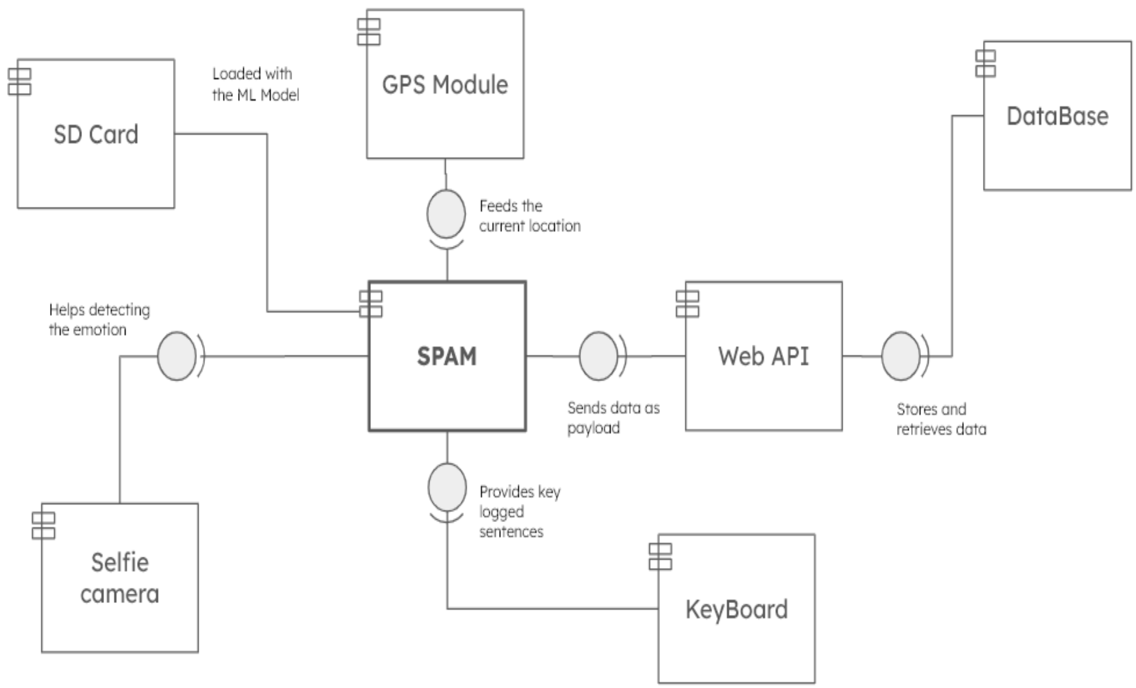

Figure 3.12 – Component Diagram

3.5.8 DEPLOYMENT DIAGRAM

A Deployment Diagram models the physical deployment of artifacts on nodes. It shows what hardware components exist, what software components run on each node, and how the different pieces are connected.

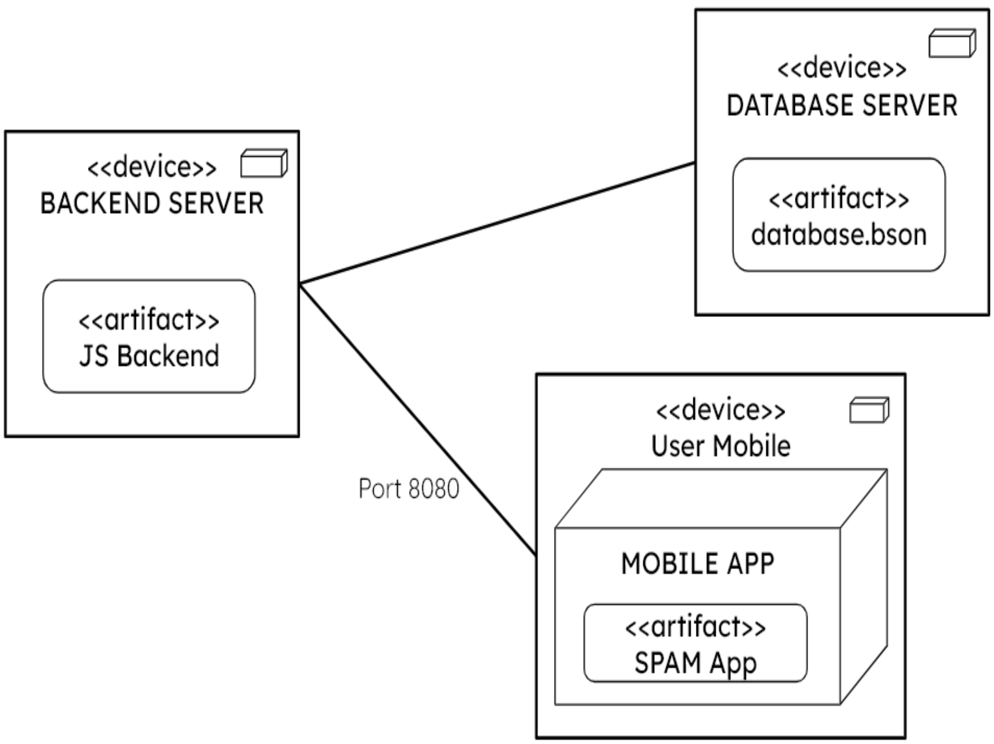

Figure 3.13 – Deployment Diagram

3.5.9 PACKAGE DIAGRAM

Package Diagram can be used to simplify complex class diagrams, it can group classes into packages. A package is a collection of logically related UML elements.

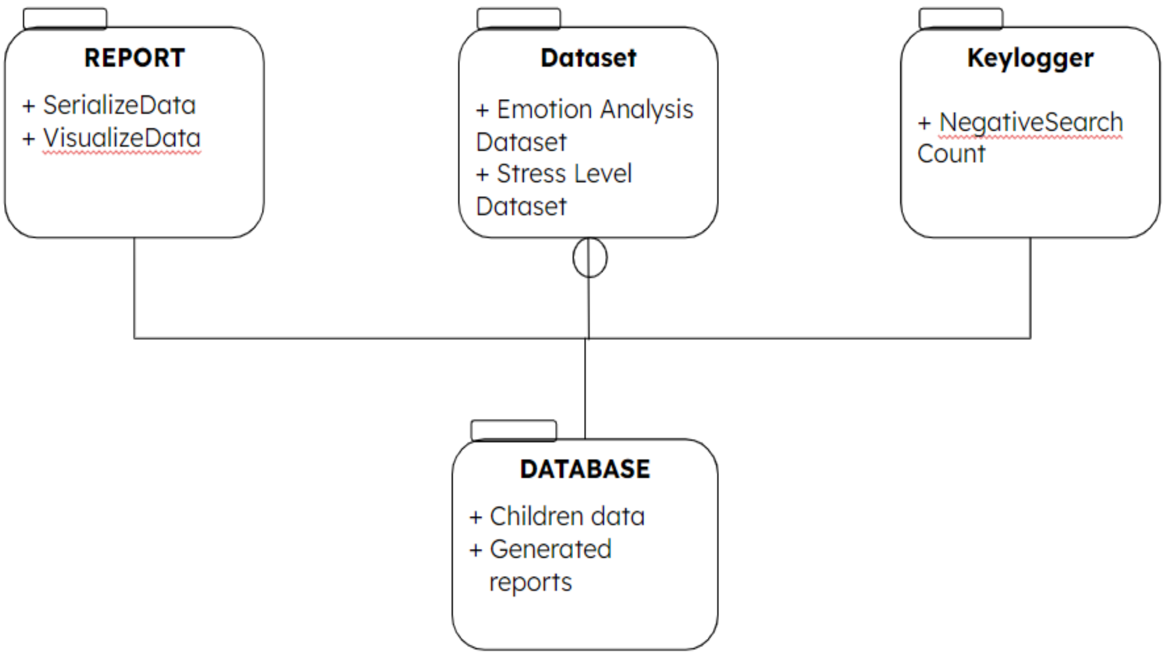

Figure 3.14 – Package Diagram

3.6 SUMMARY

All the UML diagrams for the system are drafted for a better understanding of the system's objects, functions and classes.

CHAPTER 4

SYSTEM REQUIREMENTS

4.1 FUNCTIONAL REQUIREMENTS

4.1.1 SOFTWARE REQUIREMENTS

4.1.1.1 ANACONDA PROMPT

Anaconda Prompt is a command-line interface tool that comes with the Anaconda distribution of Python. It provides access to the conda package manager, which is a powerful tool for managing Python environments, installing packages, and managing dependencies. With Anaconda Prompt, you can create and manage virtual environments, which allow you to isolate your Python installations and avoid conflicts between different versions of packages. You can also use it to run Python scripts, launch Jupyter notebooks, and install third-party packages. Overall, Anaconda Prompt is a powerful tool that can help you manage your Python development environment with ease.

4.1.1.2 PYTHON LIBRARIES

4.1.1.2.1 OPEN CV

OpenCV (Open Source Computer Vision) is an open-source library of computer vision and image processing algorithms. It was developed originally by Intel and now maintained by the OpenCV Foundation. It is written in C++ and provides interfaces for various programming languages, including Python, Java, and MATLAB. OpenCV provides a range of functions for image and video processing, including object detection, face recognition, feature detection, image segmentation, and more. It also supports machine learning algorithms, which can be used for tasks such as object classification and tracking. OpenCV is widely used in both academic research and industrial applications, and is an essential tool for computer vision developers.

4.1.1.2.2 KERAS

Keras is a high-level neural network library written in Python that provides an easy-to-use interface for building and training deep learning models. It is designed to be user-friendly and modular, allowing users to quickly prototype and iterate on their models. Keras supports a variety of popular neural network architectures and comes with pre-trained models for tasks such as image classification and language modeling. It also integrates seamlessly with other popular deep learning libraries such as TensorFlow and Theano. With its intuitive API and strong community support, Keras has become a popular choice for both beginners and experts in deep learning.

4.1.1.2.3 TENSORFLOW

TensorFlow is an open-source software library developed by Google for building and training machine learning models. It provides a comprehensive set of tools for developing and deploying machine learning algorithms, including neural networks, decision trees, and regression models. TensorFlow allows users to define complex computational graphs, which can be optimized for execution on both CPUs and GPUs. Its high-level APIs make it easy to build and train machine learning models, while its low-level APIs provide fine-grained control over model development. TensorFlow has become a popular choice for machine learning practitioners and researchers due to its flexibility, scalability, and ease of use.

4.1.1.3 REACT NATIVE

React Native is an open-source mobile application framework created by Facebook for building cross-platform apps using JavaScript and React. It allows developers to create native mobile applications for iOS, Android, and other platforms using a single codebase. It also provides access to native platform features such as camera, location, and storage through JavaScript APIs. React Native allows for hot-reloading, which means developers can see the changes in the app immediately after saving the code. It has gained popularity for its ability to create high-performance, responsive, and visually appealing mobile apps.

4.1.1.4 FIREBASE

Firebase is a cloud-based mobile and web application development platform developed by Google. It provides a suite of services that help developers build, manage, and grow their apps. Firebase offers services such as authentication, real-time database, cloud storage, hosting, cloud functions, machine learning, and more. These services can be used individually or in combination to create highly scalable and robust mobile and web applications. Firebase provides a simple and intuitive user interface, as well as comprehensive documentation and support. It has become a popular choice for app developers due to its ease of use, scalability, and real-time synchronization capabilities.

4.1.2 HARDWARE REQUIREMENTS

4.1.2.1 CPU

A CPU (Central Processing Unit) is the primary component of a computer that performs arithmetic, logic, input/output, and control operations. It is often referred to as the brain of the computer. The CPU is responsible for executing instructions in a computer program, managing the flow of data, and communicating with other devices in the system. It typically consists of one or more cores, each capable of executing multiple instructions simultaneously, resulting in faster processing. The speed of a CPU is measured in GHz (gigahertz) and determines how quickly it can perform operations. CPUs are an essential component of any modern computing device, from personal computers to smartphones and servers.

4.1.2.2 OS

An operating system (OS) is a software program that manages computer hardware and software resources and provides services to applications. The main function of an OS is to act as an interface between the computer hardware and software applications, enabling them to communicate and interact with each other Examples of popular operating systems include Microsoft Windows, macOS, Linux, Android, and iOS. The OS manages tasks such as memory allocation, file management, and device drivers. It also provides security features such as user authentication and access control. The OS is essential to the operation of a computer or mobile device, and is the foundation upon which other software applications and programs are built.

4.1.2.3 MOBILE PHONE

Mobile refers to a handheld electronic device that is capable of wireless communication, typically using cellular networks. Mobile devices have become ubiquitous in modern society, enabling people to stay connected with others, access the internet, and perform a variety of tasks while on the go. They come in a variety of forms, including smartphones, tablets, and wearable devices. Mobile technology has revolutionized the way people communicate and access information, and has enabled many new services and industries, such as mobile banking, mobile gaming, and mobile advertising. Despite their many benefits, mobile devices can also pose security and privacy risks, and it is important for users to take steps to protect their data and devices.

4.1.2.4 WEB CAM

A selfie camera is a type of digital camera that is designed specifically for taking self-portraits or selfies. It is typically found on the front of a smartphone, tablet, or laptop, and it allows users to take pictures of themselves by pointing the camera towards their face. Selfie cameras often have features such as auto-focus, image stabilization, and low-light capabilities to help users take high-quality selfies.

4.2 NON-FUNCTIONAL REQUIREMENTS

4.2.1 PERFORMANCE REQUIREMENTS

Dynamic numerical requirements:

- 95% of the operations shall be processed in less than 10s.

Static numerical requirements:

- The number of simultaneous users: Many
- The number of Kit per unit: 1

4.3 SUMMARY

The performance of Smart Phone Activity Monitor (SPAM) has been evaluated with the necessary set of test cases and it is analyzed with the proper tool. The software and hardware requirements that are listed above are installed and checked if it has proper version.

CHAPTER 5

SYSTEM IMPLEMENTATION

5.1 SYSTEM ARCHITECTURE

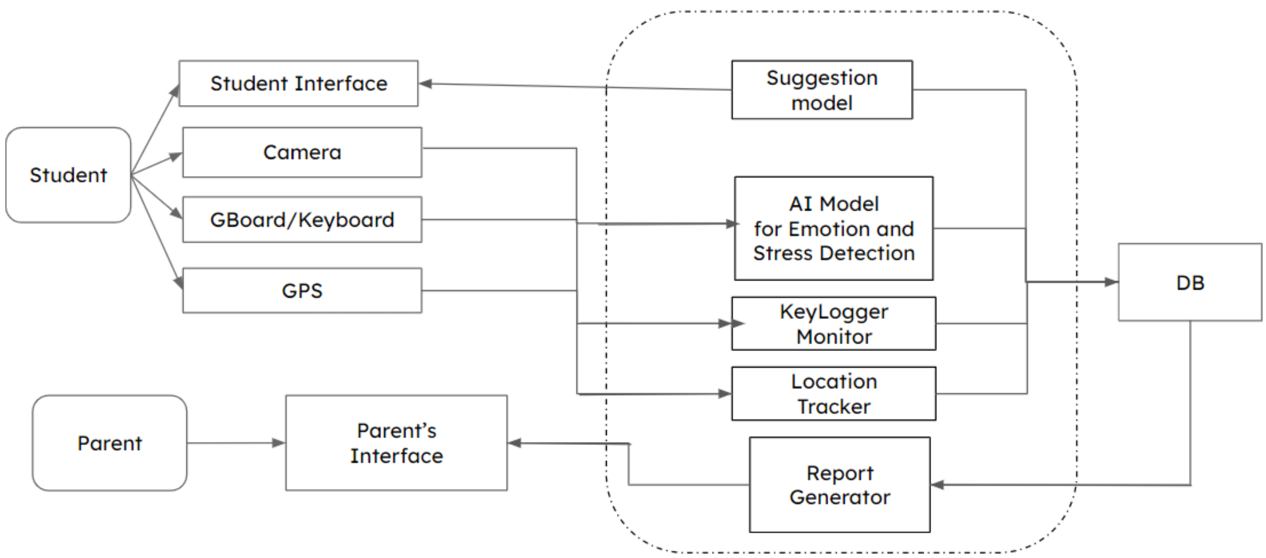

Figure 5.1 – System Architecture

SPAM is a software application designed for monitoring and recording various activities and events on a smartphone. The app can provide insights into the user's usage patterns, including the amount of time spent on each app, the number of times the phone is unlocked, and the amount of time spent on calls or messaging. The application utilizes various sensors and features of the smartphone to collect and analyze user data, including GPS location, accelerometer, and microphone data. The app can also monitor and analyze app usage, including social media, messaging apps, and other third-party apps. Some of the benefits of using a smartphone activity monitor include a better understanding of smartphone usage patterns, potential reduction of screen time and improved time management, and increased awareness of potential addiction or overuse of certain apps or features.

The app can also be useful for parents who want to monitor their children's smartphone usage and ensure their safety. However, there are also privacy concerns associated with smartphone activity monitoring, as the app may collect sensitive information and data from the user's phone. It is important to use caution and ensure that the app is from a trusted source and that the user's data is properly secured and protected. Overall, the Smart Phone Activity monitor is a software application that can provide insights into smartphone usage patterns and help users better understand their phone usage habits. However, it is important to weigh the potential benefits against privacy concerns and to use the app responsibly.

5.2 MODULE DESCRIPTION

5.2.1 EMOTION ANALYSIS AND STRESS LEVEL DETECTION

Emotion analysis and stress level detection of a teenager and youngster's phone involve using software applications on the phone to detect and analyze the user's emotional state and stress levels. The collected data can be used to provide support and intervention when necessary. For example, if the software detects that the user is experiencing high levels of stress, it can provide recommendations for stress management techniques or suggest that the user take a break or engage in a relaxing activity. It is important to note that there are potential privacy concerns associated with collecting and analyzing personal data from a teenager and youngster's phone.

It is important to use these techniques responsibly, ensure that the teenager and youngster's privacy is protected, and obtain appropriate consent before collecting and analyzing data. Overall, emotion analysis and stress level detection on a teenager and youngster's phone can provide valuable insights into the teenager and youngster's emotional state and enable teachers and other support staff to provide appropriate interventions and support. However, it is important to consider privacy and ethical concerns and use these techniques responsibly.

5.2.2 LOCATION TRACKER

Location tracking of a teenager and youngster with their mobile device involves using the GPS functionality and other sensors on the device to track the teenager and youngster's location in real time. This can be done through a mobile app or other software that is installed on the teenager and youngster's device. To use a location tracker for a teenager and youngster, appropriate consent must be obtained from the teenager and youngster and their parents or legal guardians. While location tracking can provide several benefits, it is also important to consider the potential drawbacks, such as the impact on the teenager and youngster's privacy and the potential for misuse of the data.

It is important to have clear policies and guidelines in place for how the data will be collected, stored, and used, and to ensure that the teenager and youngster and their parents are aware of these policies. In summary, location tracking of a teenager and youngster with their mobile device can be a useful tool for enhancing safety and security, attendance monitoring, tracking performance, and providing parental supervision, but it must be done in a way that respects the privacy and security of the teenager and youngster and with appropriate consent and guidelines in place.

5.2.3 APP USAGE

The app usage of a teenager and youngster's mobile device refers to the types of applications that the teenager and youngster is using on their device. This can include social media apps, productivity apps, educational apps, and gaming apps, among others. Understanding a teenager and youngster's app usage can provide insights into their interests and behaviors. For example, if a teenager and youngster is spending a lot of time on educational apps, it may indicate that they are interested in learning and are dedicated to their studies. App users can also be used to monitor teenager and youngster behavior and intervene if necessary.

For example, if a teenager and youngster is spending a lot of time on gaming apps during school hours, it may be necessary to limit their access to those apps or provide alternative activities to keep them engaged in their studies. It is important to consider other factors, such as the teenager and youngster's grades, attendance, and overall behavior, when evaluating their performance and well-being. In summary, app usage can provide valuable insights into a teenager and youngster's interests and behavior, but it should be considered alongside other factors when evaluating their academic performance and well-being. App usage monitoring can also be used to intervene if necessary and limit access to distracting or inappropriate apps.

5.2.4 KEYLOGGER

A keylogger on a teenager and youngster's mobile device is a tool that records and monitors the keystrokes made on the device. This can include usernames, passwords, and other sensitive information entered by the teenager and youngster. While keyloggers can be used for legitimate purposes, such as monitoring the device activity of young children, they can also be used maliciously to steal sensitive information. In the context of a teenager and youngster's mobile device, a keylogger may be used to monitor the teenager and youngster's activity without their knowledge or consent, potentially compromising their privacy and security.

If a keylogger is suspected on a teenager and youngster's mobile device, it is important to take immediate action to remove the software and change any compromised passwords. In some cases, it may be necessary to seek the assistance of a cybersecurity professional to fully remove the keylogger and ensure the device is secure. In summary, keyloggers on a teenager and youngster's mobile device can be used for malicious purposes, compromising their privacy and security. It is important to take steps to protect against keyloggers and take immediate action if one is suspected.

5.2.5 REPORT GENERATION

A report generated by a teenager and youngster smartphone activity monitor would typically provide an overview of the teenager and youngster's app usage, including the types of apps they are using and the amount of time spent on each app. The report may also include information on the teenager and youngster's device usage patterns, such as the times of day when the device is most frequently used and the duration of user sessions. The report may be customized to the needs of the user and may include specific details on app usage, such as the number of social media apps used, the amount of time spent on educational apps, and the frequency of gaming app usage. The report may also include a breakdown of device usage by categories, such as productivity, communication, and entertainment.

The report may also include alerts for potentially concerning behavior, such as excessive use of certain types of apps or usage during inappropriate times, such as during class or late at night. The information provided in the report can be used to gain insights into the teenager and youngster's behavior and interests and can be used to help guide interventions and support when necessary. For example, if a teenager and youngster is spending a lot of time on social media apps, the report may suggest the need for support to help the teenager and youngster manage their social media use and stay focused on their studies. In summary, a report generated by a teenager and youngster smartphone activity monitor provides valuable insights into the teenager and youngster's app and device usage, which can be used to support interventions and provide guidance when necessary. The report can be customized to the needs of the user and may include alerts for concerning behavior.

5.2.6 SUGGEST ACTIVITIES

If a teenager and youngster has depression, a smartphone app can be a useful tool to help manage their symptoms and track their progress. The app could include features such as mood tracking, medication reminders, self-care tips and activities, and access to professional support and resources. Mood tracking could allow the teenager and youngster to log their moods throughout the day, which could help identify patterns in their emotions and symptoms. The app could also provide self-care tips and activities, such as breathing exercises, guided meditation, or journaling, which can help the teenager and youngster manage their symptoms and cope with stress.

In addition, the app could provide access to professional support and resources, such as crisis hotlines, counseling services, or online support groups. This could be particularly useful for teenagers and youngsters who may not have access to in-person support or who prefer to seek help anonymously. Overall, a smartphone app can be a valuable tool for teenagers and youngsters with depression to help manage their symptoms, track their progress, and access support and resources.

5.3 SUMMARY

The proposed system is to monitor an teenager when they are in depressed situation by the modules described above with simultaneous monitoring.

CHAPTER 6

EXPERIMENTAL RESULTS

6.1 PERFORMANCE EVALUATION

Performance evaluation of the smart phone activity monitor report was conducted to assess the effectiveness and efficiency of the monitoring system. The evaluation was based on various key criteria, including accuracy, functionality, usability, and reliability.

Accuracy: The accuracy of the smart phone activity monitor was evaluated by comparing the monitored data with ground truth data. This involved measuring the precision and recall rates of the system in accurately capturing and recording different activities such as calls, texts, app usage, and screen time. The evaluation also considered any false positives or false negatives produced by the system, and their impact on the overall accuracy of the monitoring system.

Functionality: The functionality of the smart phone activity monitor was assessed by examining its features and capabilities. This included evaluating the range of activities that could be monitored, the ease of setting up and configuring the system, and the comprehensiveness of the captured data. The evaluation also took into account any additional functionalities such as GPS tracking, social media monitoring, or web browsing tracking, which could enhance the overall utility of the system.

Usability: The usability of the smart phone activity monitor was evaluated by assessing the ease of use and user-friendliness of the system. This included examining the user interface, the navigation, and the overall user experience of the system. Factors such as the ease of installation, the clarity of instructions, and the availability of user support were considered in the evaluation.

Reliability: The reliability of the smart phone activity monitor was assessed by examining its stability, consistency, and robustness. This included evaluating the system's ability to consistently capture and record activities over time, its resistance to errors or crashes, and its ability to handle different types of devices, operating systems, and usage patterns. The evaluation also considered any potential privacy and security concerns, and the measures taken by the system to protect the data collected.

6.2 TIME FACTOR

1. The module connects to the mobile application and goes online in under ten seconds.
2. The bandwidth of the data and the latency of the value change are both WiFi.
3. There is a 5-second pause between any two consecutive alerts.

6.3 SUMMARY

The proposed system has good performance when compared to the existing system. It has faster performance and secured data privacy.

CHAPTER 7

CONCLUSION AND FUTURE ENHANCEMENT

7.1 CONCLUSION

In conclusion, a smartphone activity monitor is a powerful tool for parents and educators to gain insights into a teenager and youngster's behavior, interests, and well-being. By tracking activities such as app usage, device usage, location, and web browsing, the monitor can provide valuable information that can help identify potential issues and support the teenager and youngster's development and well-being. The monitor can be especially useful for identifying patterns of behavior that may require intervention or support, such as excessive device use or potentially concerning app usage.

In addition, alerts can be set up to notify parents or educators of concerning behavior, which can help ensure that the teenager and youngster is receiving the appropriate support and care. While there may be concerns about privacy and data protection, smartphone activity monitors can be used in a responsible and ethical manner to support the teenager and youngster's development and well-being. By using these tools, parents and educators can gain a better understanding of the teenager and youngster's behavior and interests, and provide a more personalized and supportive approach to their development and well-being.

7.2 FUTURE ENHANCEMENT

The smartphone activity monitor for teenagers and youngsters is a powerful tool for gaining insights into their behavior and well-being. However, there are several ways in which it could be enhanced in the future to provide even more value to parents and educators. One potential enhancement could be to incorporate machine learning algorithms into the monitor to identify patterns and trends in the data. For example, the monitor could use machine learning to identify when a teenager and youngster's behavior deviates from their usual patterns, and alert parents or educators if there is a potential issue. This could be especially useful for identifying potentially concerning behavior early on, and providing support and intervention as needed. Another potential enhancement could be to provide more detailed analytics and visualizations of the data.

For example, the monitor could provide more granular data on app usage, such as the amount of time spent on each app, and whether the app is used during school hours. This could provide a more complete picture of the teenager and youngster's behavior and help identify potential issues or areas for improvement. Finally, the monitor could be enhanced to incorporate more advanced features such as natural language processing or sentiment analysis, which could help identify potential issues related to the teenager and youngster's mental health or emotional well-being. By incorporating these features, the monitor could provide even more personalized and targeted support for the teenager and youngster's development and well-being. Overall, there are many ways in which the smartphone activity monitor for teenagers and youngsters could be enhanced in the future to provide even more value to parents and educators, and better support the teenager and youngster's development and well-being.

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APPENDIX I

SAMPLE CODE

Emotion.py

```
import cv2
import numpy as np
import mediapipe as mp
from keras.models import load_model
model  = load_model("model.h5")
label = np.load("labels.npy")
holistic = mp.solutions.holistic
hands = mp.solutions.hands
holis = holistic.Holistic()
drawing = mp.solutions.drawing_utils
cap = cv2.VideoCapture(0)
while True:
lst = []
_, frm = cap.read()
frm = cv2.flip(frm, 1)
res = holis.process(cv2.cvtColor(frm, cv2.COLOR_BGR2RGB))
if res.face_landmarks:
	for i in res.face_landmarks.landmark:
		lst.append(i.x - res.face_landmarks.landmark[1].x)
		lst.append(i.y - res.face_landmarks.landmark[1].y)
	if res.left_hand_landmarks:
		for i in res.left_hand_landmarks.landmark:
			lst.append(i.x - res.left_hand_landmarks.landmark[8].x)
			lst.append(i.y - res.left_hand_landmarks.landmark[8].y)
	else:
		for i in range(42):
			lst.append(0.0)
	if res.right_hand_landmarks:
		for i in res.right_hand_landmarks.landmark:
			lst.append(i.x - res.right_hand_landmarks.landmark[8].x)
			lst.append(i.y - res.right_hand_landmarks.landmark[8].y)
	else:
		for i in range(42):
			lst.append(0.0)
	lst = np.array(lst).reshape(1,-1)
```

```
        pred = label[np.argmax(model.predict(lst))]
        print(pred)
        cv2.putText(frm, pred, (50,50),cv2.FONT_ITALIC, 1, (255,0,0),2)
drawing.draw_landmarks(frm, res.face_landmarks, holistic.FACE_CONNECTIONS)
drawing.draw_landmarks(frm, res.left_hand_landmarks, hands.HAND_CONNECTIONS)
drawing.draw_landmarks(frm, res.right_hand_landmarks, hands.HAND_CONNECTIONS)

cv2.imshow("window", frm)

        if cv2.waitKey(1) == 27:
        cv2.destroyAllWindows()
        cap.release()
        break
```

Location.js

```
import React, { useState, useEffect } from "react";
import MapView, { Circle, Marker } from "react-native-maps";
import { StyleSheet, View } from "react-native";
import * as Location from "expo-location";
import { db } from "../FireBase";
import {ref,set} from "firebase/database"
export default function App() {
  const pin1 = {
    latitude: 13.059278,
    longitude: 80.233656,
  };
  const initial = {
    latitude: 13.059278,
    longitude: 80.233656,
    latitudeDelta: 0.002,
    longitudeDelta: 0.002,
  };
  const [pin, setPin] = useState({
    latitude: 13.059278,
    longitude: 80.233656,
  });
  // useEffect(()=>console.log(pin),pin);
  useEffect(() => {
    (async () => {
      let { status } = await Location.requestForegroundPermissionsAsync();
      if (status !== "granted") {
        console.log("Permission to access location was denied");
```

```
      return;
    }

    let location = await Location.getCurrentPositionAsync({});
    console.log(pin1);
    setPin({ latitude: location.coords.latitude, longitude: location.coords.longitude});
  })();
}, []);

useEffect(()=>{
 set(ref(db,'Report/Location/'),{
   Latitude:pin1.latitude,
   Longitude:pin1.longitude
 })
 .then()
 .catch((err)=>console.log("error"))
})
   return (
   <View style={styles.container}>
     <MapView
       style={styles.map}
       initialRegion={{
         latitude: 13.059278,
         longitude: 80.233656,
         latitudeDelta: 0.002,
         longitudeDelta: 0.002,
       }}
       showsUserLocation={true}
       onUserLocationChange={(e) => {
         setPin({
           latitude: e.nativeEvent.coordinate.latitude,
           longitude: e.nativeEvent.coordinate.longitude,
         });
       }}
     >
       <Marker
         coordinate={pin1}
         title="child"
         description="The place where your child last visited"
       />
       <Circle center={pin1} radius={100}></Circle>
     </MapView>
   </View>
```

```
  );
}
const styles = StyleSheet.create({
  container: {
    flex: 1,
  },
  map: {
    width: "100%",
    height: "100%",
  },
});
```

Keypad.py

```
from pynput import keyboard
result=""
def on_press(key):
    global result
    try:
        result=result+key.char
    except AttributeError:
        reskey=key
        if (str(reskey)=="space   "):
            result=result+""
            print(result)
        else:
            result=result+""+str(reskey)+""
            print (result)
with keyboard.Listener(on_press=on_press) as Listener:
    Listener.join()
```

Suggestion.js

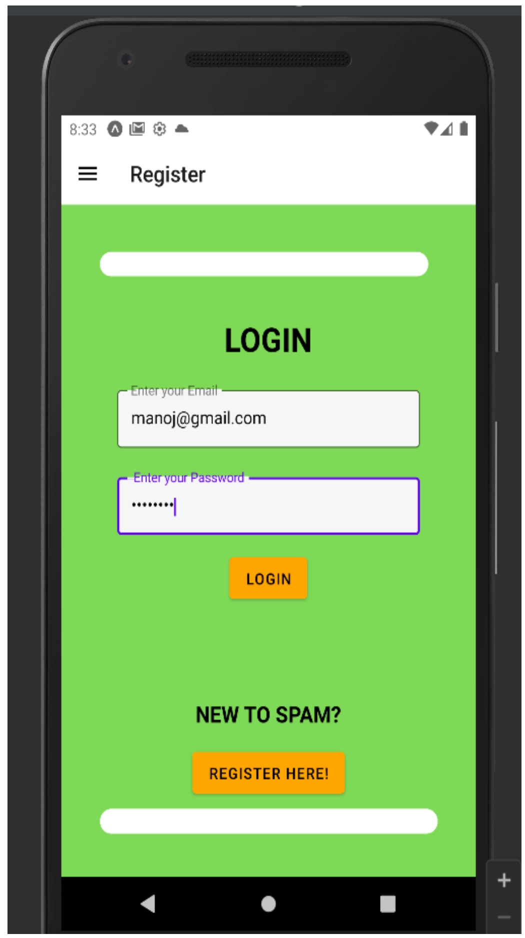
```
import React from "react";
import { View, Text, Image, StyleSheet, FlatList } from "react-native";
// Define motivational quotes data
const quotes = [
  {
    id: 1,
    quote:
      "The harder you work for something, the greater you'll feel when you achieve it.",
    author: "Unknown",
    image: require("../components/pin.png"),
```

```
  },
  {
    id: 2,
    quote: "The secret of getting ahead is getting started.",
    author: "Mark Twain",
    image: require("../components/pin.png"),
  },
  {
    id: 3,
    quote:
      "Believe in yourself and all that you are. Know that there is something inside you that is greater than any
   obstacle.",
    author: "Christian D. Larson",
    image: require("../components/pin.png"),
  },
];

const MotivationalQuotesApp = () => {
  // Render individual quote card
  const renderQuoteCard = ({ item }) => (
    <View style={styles.cardContainer}>
      <Image source={item.image} style={styles.image} />

    </View>
  );

  return (
    <View style={styles.container}>
      <FlatList
        data={quotes}
        renderItem={renderQuoteCard}
        keyExtractor={(item) => item.id.toString()}
      />
    </View>
  );
};
// Styles
const styles = StyleSheet.create({
  container: {
    flex: 1,
    backgroundColor: "#f5f5f5",
    padding: 16,
  },
```

```
  cardContainer: {
    backgroundColor: "#fff",
    borderRadius: 8,
    elevation: 2,
    marginVertical: 8,
    padding: 16,
  },
  image: {
    width: "100%",
    height: 200,
    borderRadius: 8,
    marginBottom: 8,
  },
  quoteContainer: {
    flex: 1,
  },
  quoteText: {
    fontSize: 16,
    fontWeight: "bold",
    marginBottom: 8,
  },
  authorText: {
    fontSize: 14,
    color: "#777",
  },
});

export default MotivationalQuotesApp;
```

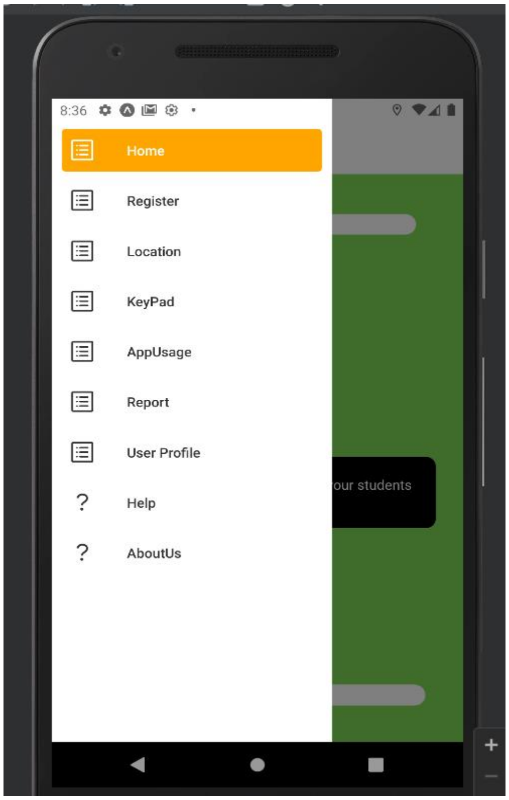
APPENDIX II

SNAPSHOTS

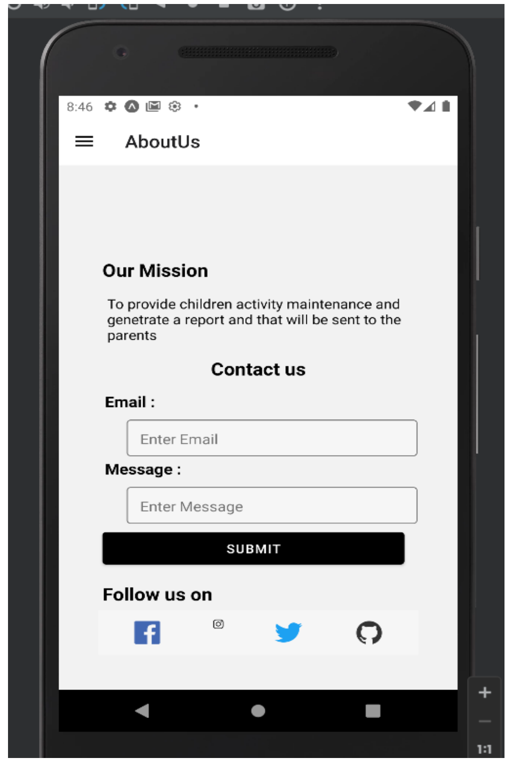


FIG(I)- SIGNUP PAGE

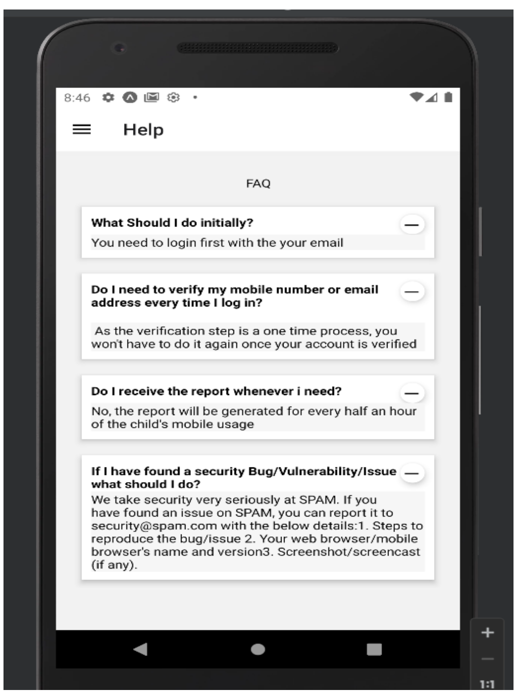
FIG(II)- LOGIN PAGE



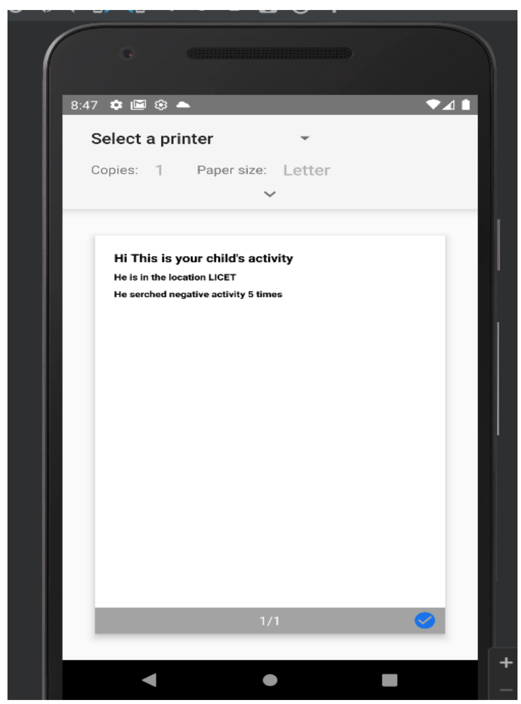
FIG(III)- NAVIGATION PAGE



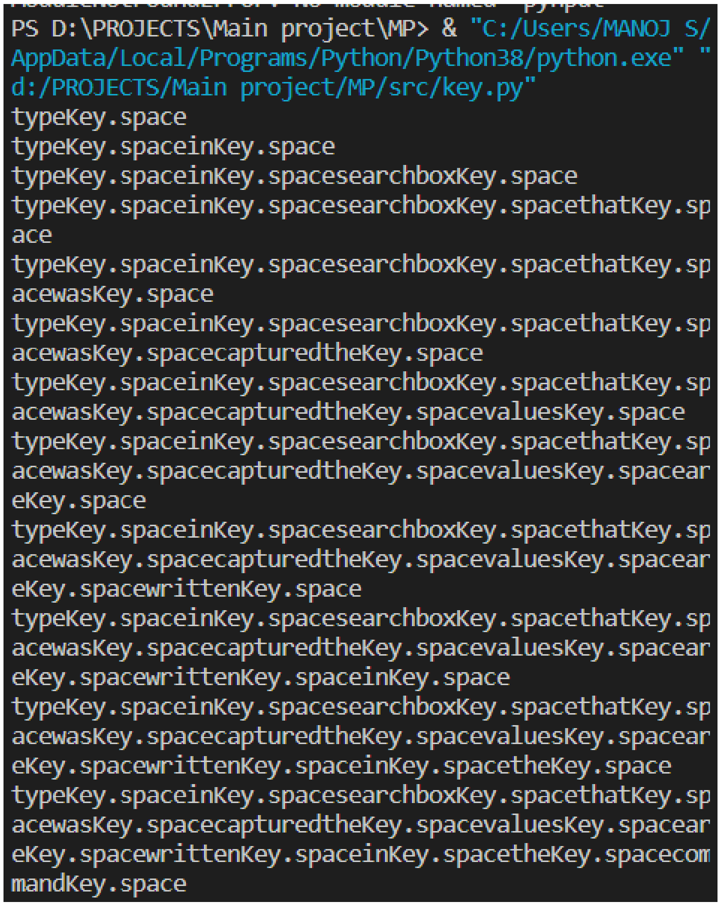
FIG(IV)-ABOUT PAGE



FIG(V)-HELP PAGE



FIG(VI)-REPORT PDF



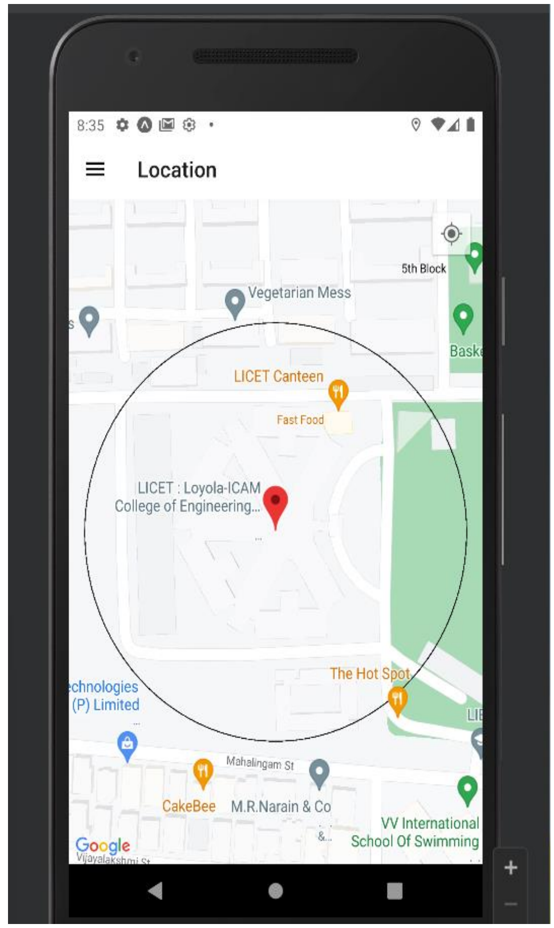


FIG (VII)-KEYLOGGER

FIG(VIII)-LOCATION PAGE

FIG (IX)- EMOTION DETECTION PAGE

APPENDIX III

ACCEPTANCE LETTER

Intimation of Paper selection-Reg External Inbox ×

1 of 2

NCCIS 2023
to janani.a@licet.ac.in, bcc: me

Wed, Mar 29, 1:17 PM

Dear Participants,
We are glad to inform you that your paper has been selected for NCCIS23. Kindly send the powerpoint presentation by 8pm today. Please make sure you have the hardcopy of your paper on the day of presentation. Looking forward for your cooperation and support,It is mandatory to send the ppt by today evening
Regards
NCCIS Team

LOYOLA - ICAM COLLEGE OF ENGINEERING & TECHNOLOGY (LICET)
Loyola Campus, Nungambakkam, Chennai – 600 034
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LOYOLA - ICAM COLLEGE OF ENGINEERING & TECHNOLOGY (LICET)
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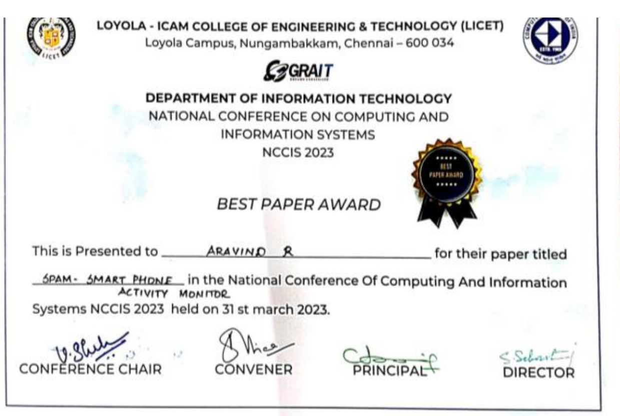

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Loyola Campus, Nungambakkam, Chennai – 600 034
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