# An improvised dementia patient caring mechanism through Who Am I

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**Abstract:**
Dementia and Alzheimer's disease have become increasingly common in the modern world, with more and more people affected by the debilitating effects of these conditions. These diseases can be particularly difficult for caregivers and loved ones, who struggle to help those afflicted maintain their independence and quality of life. To address these challenges, a group of researchers has developed an innovative system that leverages the power of mobile applications, cloud computing, and machine learning to improve the lives of those living with dementia.

The system is based on an Android application that has been specifically designed to address the needs of individuals living with dementia. By leveraging the power of mobile devices, the application aims to bridge the gap between patients and caregivers, providing users with a range of tools and features that can help them maintain their independence and quality of life. The use of Android as the operating system was a deliberate choice, as it is widely used and open-source, making it accessible to a broad range of users. The application is built on a foundation of Firebase cloud and MySQL ROOM database, which provide a robust and secure framework for storing data. Machine learning (ML) dependencies are also integrated into the system, allowing users to validate images of family and friends for memory retention. This feature is particularly useful for individuals with dementia, who may struggle with memory loss and find it difficult to recognize the people in their lives.

The application provides a range of basic functions that can help users manage their daily lives more effectively. These functions include Personal Information, GPS Navigator, Doctor Involvement, Emergency Button, To-Do List, and Notification/Reminders. The Personal Information feature allows users to store and access important personal details, such as their name, age, and medical history. The GPS Navigator feature provides users with real-time information about their location and helps them navigate to their destination safely. The Doctor

Involvement feature enables doctors to track the progress of their dementia patients and adjust their treatment plans accordingly. The Emergency call Button feature provides users with immediate access to emergency call in case of an emergency. The To-Do List feature allows users to create and manage tasks, while the Notification/Reminders feature sends alerts and reminders to users to help them stay on track. One of the most notable aspects of the system is the Doctor module, which is a new invention that allows doctors to track the progress of their dementia patients. This module provides doctors with valuable data insights that they can use to adjust appointment plans, monitor medication adherence, and make informed decisions about the care of their patients. By providing doctors with real-time data about their patients, this module has the potential to improve the overall quality of care for people living with dementia.

Overall, the system developed by these researchers has the potential to significantly improve the lives of people living with dementia and their caregivers. By leveraging the power of mobile applications, cloud computing, and machine learning, this system provides users with a range of tools and features that can help them maintain their independence and quality of life. With further improvements and advancements in the medical field, this system has the potential to become even more effective in helping individuals with dementia and Alzheimer's disease.
**Keywords:** dementia; android; reminder; tensorflow; tflite; firebase; MySQL ROOM; FaceNet.
**DOI:** 10.24297/j.cims.2023.6.4

## 1. Introduction

Dementia is a one type of disease which affects the memory and thinking of patient. Therefore, they will not be able to perform their daily activities. According to WHO (World Health Organization) Currently dementia disease affects a lot of people i.e., more than 55 million patients of dementia present over worldwide. Near about 10 million new cases are found every year. Dementia is caused by various diseases and various injuries which affect the brain. In dementia the Alzheimer’ s disease is the most common which involves around 70% cases. Dementia is now the leading cause of death and one of the leading causes of dependency and disability among the elderly worldwide. Since 2019, dementia costs the global economy US$ 1.3 trillion, about 50% of these costs come from the care provided by caregivers (such as family members and close friends), who provide average of 5 hours care per day.

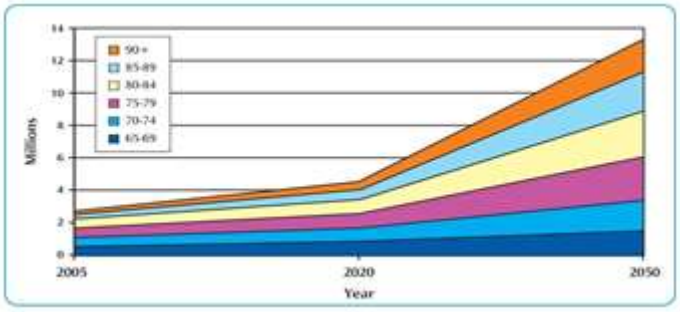


**Figure 1.1 Dementia Statistics according to age**

The disease worsens over time. It usually affects older people, but not everyone will get it as they get older. The main reasons which lead to the cause of dementia are Diabetes, high blood sugar, hypertension and high blood pressure. Many life style factors can also lead to the cause of disease such as smoking, being overweight, drinking too much alcohol and being physically inactive. Additionally experiencing depression and being isolated socially are also the risk factors which may lead to the cause of disease. All these factors do not guarantee the cause of the disease, adopting healthy lifestyle, staying socially engaged all this may contribute to led a healthy lifestyle and reduce the risk of getting affected. Dementia has a psychological, physical, social and economic impact not only for the people affected with dementia but also for their families, carers, society and relatives at large. There is a lack of understanding of dementia and awareness about dementia, which results in barriers to diagnosis and stigmatization and care.

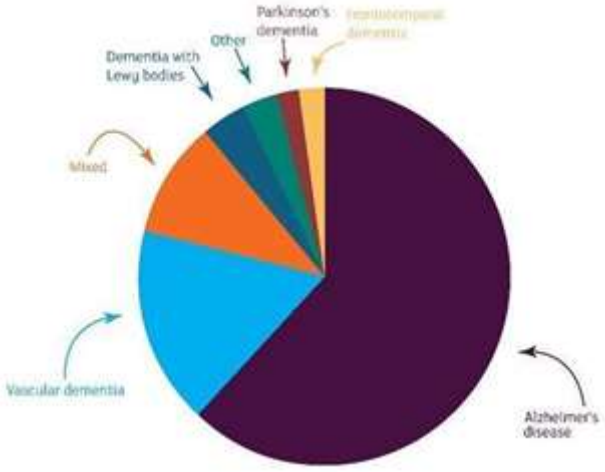


**Figure 1.2 Dementia Statistics according to type**

The people who are diagnosed with the disease are likely to go through change of emotions. These may also include loss, grief, shock, anger, disbelief and fear. This disease affects millions of people all across the globe. All the people affected with this disease need to be taken care of

which results in the cost of 85,775 dollar every year and this number is expected to grow and reach 511 billion dollars in next 10years of time. So, their needs to be a way to take care of the patients by the use of new age technology such as Cloud, ML and Android. By the use of the technology, we can remind patients about their daily work, it can also help patients to identify people, it can also help the guardian keep track of patient' s location. There is a lot of dependency on the guardian of the patient so to reduce their responsibility and get the work done easily we have decided to develop an application which will help the patients to led an easy life.

We have developed an application which will help in reducing the dependencies on guardian. Due to the use of this application the Doctor, Guardian, patient all are connected with each other. The Guardian can also keep a track on the patient. We have made use of Cloud in which we will be storing the login information about the patients, guardians and the doctor. The patient will also be able to store the images of the people which he meets in his day-to-day life so that he can refer it whenever necessary. Patients can also create their to-do list in day-to-day life which also gives reminder about the task whenever necessary. Patients are also available with their home location in the app which they can use to get home. Firstly, when the patients sign up on the app, they have to fill the emergency contacts which are used to contact the respective person in an emergency. The guardian can also stay connected with the doctor and contact the doctor when needed. The guardian can also use this app to set the patients daily routine and it can also be used to keep the track of the patient' s location, it also notifies the guardian whenever the patient gets out of the specified location range. When the doctor log in into the app he can access the list of patients which he is currently treating. He can also send the prescription of the medicines whenever needed. If the doctor sets the appointment, then the patient gets notification regarding it.

**Objective:**

The study has analysed the development of mobile app because now a days every person has his individual mobile phone which can be used to use the application which will help in reducing the dependency on the guardian and connecting the patient, guardian and the doctor.

The objective of this is to know how technology has been incorporated into the application to keep track on the patients, store the images of the people which the patients meet, store their

day-to-day task, set reminders. So, we thought that which technology could be used to take care of patients, so Cloud and ML were used to make the task easier and increase the efficiency.

To develop mindful co-design approaches to empower people with dementia to express their needs and challenges with social engagement during the design process.

The use of technology and conceptual development of the solution to the problems, which are both personal and environmental.

## 2. Literature Survey

Sundar C and his colleagues [1] have developed a mobile application to provide comfort to patients, caregivers and doctors suffering from dementia or Alzheimer's disease. The medical history of the patients and information about the patients related to their family and friends are reviewed. Using Google Maps, they developed a location tracking system to determine the patient's position next to the guard. The authors created a status tracking plan if patients wander beyond certain limits and notify the supervisor. This method motivates the patient to remember the medicine. Remember that photos and videos recorded by family and friends can be saved in the app. When family or friends are not around, this office helps patients. There is also the issue of emergency calls when a patient needs help. The template contains modules such as login/registration for caregivers and patients after using the Firebase authentication service.

Musani Aqsa [2] has proposed a system with two instruments, one for the patient and the other for the caregiver. They analyzed the symptoms of depressed patients and studied the complexities in brain function, including memory, calculation, language, judgment, and learning abilities. Dementia sufferers go through the seven stages of severe depression, severe cognitive impairment, mild depression, mild cognitive impairment, and cognitive impairment. in the heart, depression is mild and unintelligible. Dementia affects many aspects of being human such as social behaviour and emotional management. So, the author has created a template with a game function to check the progress story regularly with the ability to think. The proposed system also includes GPS monitoring from the caregiver's side to track the patient's location. The process helps to track the work process and the medication process through memory. Quiz games are introduced to get to know family members and friends, and to stimulate useful brain activity games.

Huansheng Ning gave an article [3] in SGDC and they talk about the section of Serious Games for Dementia Care (SGDC). In general, the treatment of this disease is based on drug therapy without the results we want, so the article explains how SGDC is a method that can be a treatment that will help improve the progress of those with a disabling disease. As a serious game, they will be used to treat dementia patients, so these games will not be for fun. During the Huarongdao period, these traditional jigsaw puzzles were used for dementia care. The main purpose of this article is to help researchers to develop SGDCs efficiently and effectively. According to the WHO, dementia patients have three stages and for this, different games have started based on the importance of these stages, as the first patients have common problems such as reduced thinking ability and problems related to memory that will be difficult to identify, so Fitt & Hick games and memory games etc. The second patients suffer the same problems as the first patients with the added problem of physical problems for this place click on the game and the game of the game that is created for the patients as any research done on the subject a. In the third stage, patients have a bad condition, they often have a problem with collective memory. Using serious sports to treat disabled patients, the main requirement is that patients should be able to understand the rules of the game, but at this time, patients will not be able to understand the rules. Therefore, hard games are not suitable for this level. This article also reviews forms of assessment that have therapeutic value. This means checking whether these serious games are effective in treating patients with disabilities or not. This article presents the model for the future, including the addition of therapeutic methods such as reminiscence therapy and music, which will also be useful for dementia care. We refer to this article to learn more about patients with disabilities. We learn how we can care for patients with disabilities and the problems they face. As mentioned earlier, this article aims to help researchers develop SDGC. The conclusion of this article is to provide effective and appropriate treatment that will cure dementia rather than drug-based treatment. The medicine will bring something hard to play with. But the suggestion that the suggestion indicates in this article portrayed the media that has a lot of patients and professionals, etc. which is a great addition to the game now. This article aims to guide researchers in the development and creation of a fun game that will help in the treatment of patients with disabilities.

Shakila Basheer [4] talk about Alzheimer's disease which is a progressive stage of dementia. Elderly people often encounter dementia whose symptoms include loss of certain cognitive abilities and memory loss. But Alzheimer's disease is another stage of dementia where a person

can die because of the connection of brain cells and even the cells themselves are damaged and die leading to complete memory loss and problems related to mental function. Patients suffering from Alzheimer's disease will also live for less than a few years, again depending on various factors. But this disease can be recognized at an early stage so that a person can get the right treatment to cure Alzheimer's disease.

This article focuses on the early diagnosis of Alzheimer's disease to help patients recover. The proposed model uses a modified capsule network better than using a CNN because the modified capsule network solves the problem of CNN such as the lack of feature aggregation and spatial information.

According to this article review, many other brands are using CNN. But the proposed method has the advantage that it uses a capsule network that is used for the management of problems related to the design process and provides advantages related to accuracy and good calculation compared to CNN. The proposed model also uses the PCA kernel method to build a simple model so that we can use this model in the clinic. This model uses a classification system by providing images and processes using CNN and CapNet in the image retrieval process. It also works by taking some photos as a sample and even removing some images while the next step is before processing the images. Once that is done, the model performs the feature recognition of the images, and finally, it trains the model and builds the model. In this model, data preparation is done by accessing the database from the OASIS dataset which includes many PET and MRI images of patients suffering from Alzheimer's disease. This system uses the latest capsule network, which takes input data and creates a parent vector that considers various features. The CNN and activation function retrieves the data and provides a transformation vector. In this case, KPCA is used to generate a plan before data is transmitted. At CNN, squash is used as a unique promotional feature. The output of the Squash function shows how to extract the data. The research is done on the OASIS longitudinal MRI dataset using this we can predict dementia praecox. For the analysis of these data, different Python libraries are used. In this article, we studied longitudinal MRI images with neuroimaging images. This model uses a different capsule formulation of dementia.

Zhengyan Sheng [5] developed a convolutional neural network (CNN) to distinguish between disabled patients and healthy patients. This method uses visual observation and two words for subject identification. They developed two models, first field image recognition and automatic

speech recognition to extract features related to eye tracking and speech. In another step, the neural network combines these two models to identify patients with disabilities. Patients in the early stages of dementia have language problems. To diagnose dementia using words, several databases have been developed for dementia diagnosis. Dementia can also be detected based on eye-tracking features. Many datasets have been designed for the detection of dementia using eye tracking. Previous methods used the same type of data to identify patients with disabilities, but the use of different adaptive neural networks is a better option. This data was collected from patient records from Shanghai Tongji Hospital. All patients had different types of dementia and underwent physical examination and cognitive function tests. The dataset consists of a record of Chinese words and subject tracking during the picture description task. In the task, subjects were asked to describe as many "cookie theft" images as possible. The doctors gave them advice when explaining the image. The comments of the patients and the doctors' advice were recorded through the microphone. Each patient's eye movement is monitored and features such as eye position, eye movement condition, state time, pupil size, etc.

Suriya Murgan [6] created (DEMNET) the DEMENtia NETwork to find the level of dementia using MRI. This is a CNN, that is, a convolutional neural network, which is used to generate a method that can be used to find some aspects of Alzheimer's disease using MRI (Magnetic resonance imaging). The network considers the four dimensions of psychiatry and brings significant opportunities from the structure of the patient's brain. The four categories are: i) Mild dementia ii) Mild dementia iii) Moderate dementia iv) Severe dementia. The model uses CNN to extract different objects. The model is evaluated by training it on Kaggle's MRI dataset. This dataset contains 6400 MR images of four classes Mild Demented (MID), Moderate Demented (MOD), Non-Demented (ND) and Very Mild Demented (VMD). This dataset contains images of size 176*208. These images are then resampled to 176*176 size. This dataset is class imbalanced because the number of images in each class is unequal. The synthetic minority oversampling technique (SMOTE technique) is applied to this dataset which increased the total number of images to 12800, with each class having 3200 images. This dataset is split into 10% for validation, 10% for testing, and 80% for the training set from 12800.

A research article by MD Rishad Ahmed [7] provides an in-depth review of important neuroimaging techniques and related research methods developed over the past few years for the diagnosis of psychiatry. Recent reviews have addressed only one type of imaging, which includes MRI, PET, and one type of dementia, such as Alzheimer's disease. For dementia

diagnostics, they generally cover a wider range of imaging, machine learning and deep learning technologies so that specialists in this field can quickly determine its state of the art. Additionally, they stress the significance of early dementia detection and prediction so that patients can receive treatment and support as early as possible. This will help to slow down the deterioration process and help the patient to live longer. Their research is divided into different sections: (1) in the context of dementia diagnosis, a discussion of the latest neuroimaging techniques for important medical applications (2) an overview of machine learning techniques, especially deep learning techniques for early detection. of dementia. To identify different types of demeans, including the neuro ration industry, including livestock, Mri, and deeply in deep technology. They concluded that using Mri's research is a guarantee to identify the media such as the VD, PD, and FTD. This is based on performance measurements across algorithms in the available literature. They also found that deep learning methods outperform traditional machine learning and imaging techniques in analyzing brain images obtained using modern imaging techniques. As a result, the field continues to advance rapidly in providing an accurate and comprehensive diagnosis of dementia in all its forms. More studies are needed to improve the categorization for the diagnosis of dementia, especially for early detection so that treatment can begin earlier.

Shehroz S. Khan [8] identified aggression using unsupervised deep learning and using video aids in people with dementia. A long-term care facility (LTC) has a CCTV system, and the team developed a computer vision algorithm to study these videos to identify problems of motivation in people with disabilities. Since anxiety symptoms are rare, they can be considered negative. They created an unsupervised neural network that was trained over 24 hours of recording normal events and then tested it on 11 hours of videos containing both chaotic and normal events. The database consists of videos from a total of 20 participants in the Special Research Unit at TRI, located in Toronto, Canada. Fifteen cameras were installed in public areas such as entertainment venues, restaurants, and group corridors. Due to privacy concerns, cameras were not placed in the toilets and bedrooms of the participants. Recordings were made only between 7 and 23. The most recent data set includes data from 17 participants, excluded due to the lack of provocative events. This data was collected from a total of 600 days of video. A total of 35 hours of participant video data was analyzed and divided into test and training data sets. The training data set consists of approximately 24 hours of video data, with only normal events. The test consisted of 11 hours of video data with no breaks. The test samples were divided into 30

seconds labelled as (0) and (1) normal vibration to evaluate the performance of the developed model.

Spatial mobility [9] is the ability to find and maintain a path from one place to another. Depressed patients have problems with spatial navigation. Spatial navigation ability decreases with the level of dementia for the patient and can be considered a diagnostic feature. These people with dementia rely on mobility aids for their daily activities. Léa Pillette and her co-authors conducted a systematic review of the navigation system for people with disabilities. This review aims to provide a qualitative analysis of navigation systems that have been tested in people with disabilities and to provide guidance for the implementation, design and evaluation of future navigation systems for patients with disabilities. The main focus of the research is i) Key recommendations provided by the system ii) the Technology of the device based on it iii) the Test method used to test the device. This review aims to provide answers to the following questions: 1) What key devices for people with dementia have been tested and developed? 2) Do they improve daily living ability and mobility? 3) What qualities are useful? 4) How are the tools measured?

## 3. System Architecture

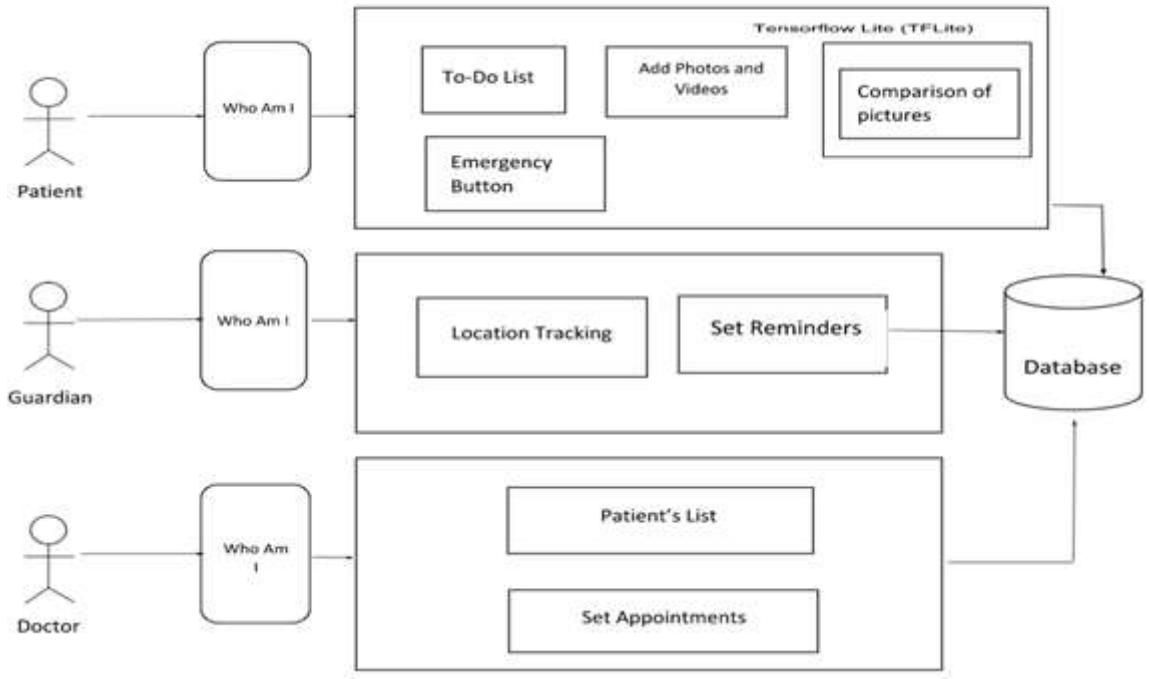


Figure 3.2 System Architecture

Three primary parts make up the suggested system architecture: Doctor, Guardian, and Patient. While the Guardian component monitors patient locations and issues reminders, the Doctor component manages patient data and schedules appointments. Features like a To-Do List, Add Photos and Videos, an Emergency Button, and Picture Comparison are available in the Patient component.

Three levels make up the system's architecture: the display layer, the application layer, and the data layer.

1. Presentation Layer: The presentation layer serves as the system's user interface. The layer is composed of a mobile application created with Java, XML, and Android Studio. All the important capabilities are accessible from the home screen, and the user interface is made to be simple to use and intuitive.

2. Application Layer: The system's fundamental features are contained in the application layer. The modules are Doctor, Guardian, and Patient. Each module offers functions specific to its domain.

a) Doctor Module: The Doctor Module gives doctors access to the patient list and their personal information. Doctors can use it to manage patient data and plan appointments for individual patients in accordance with their schedules. The following functionalities fall under the purview of this module:

Making appointments for each patient in accordance with their schedule.

Gaining access to and managing the list of patients.

b) Guardian Module: The Guardian Module enables carers to monitor a patient's whereabouts using the GPS on the device and to schedule reminders for the patient's daily activities. These features are offered by this module:

Location tracking: Using the device's GPS, the carer can follow the patient's whereabouts.

Setting reminders: The guardian can programme reminders for the patient's daily responsibilities, such as taking their medications on time, or any other job that must be done.

c) Patient Module: The Patient Module offers amenities to make daily life easier for dementia patients. A To-Do List, Add Photos and Videos, an Emergency Button, and a Comparison of Pictures are its four key features.

To-Do List: Using this feature, the patient can keep track of their daily obligations.

Add Photos and Videos: With this feature, patients can save images and videos of friends, family members, and any other locations they visit. These can then be accessed in the future to help with memory recall.
Emergency Button: The patient can use this feature if they are in danger, experiencing a panic attack, or having any other problem. This will notify their carer.
Picture Comparison: With this feature, patients can learn more about a person by comparing that individual to earlier-taken pictures and videos.

3. Data Layer: The database's data is stored and retrieved by the data layer. Data is stored in the system using a Firebase No-SQL database. Utilising Firebase ML Dependency, the Comparison of Pictures feature is made feasible. The application's ability to collect data in real time makes it an effective and trustworthy solution.

4. Firebase ML Dependency: The Firebase ML Dependency is in charge of utilising machine learning algorithms to provide the feature of photo comparison. This layer, which Firebase provides, is utilised in the Patient Module's Comparison of Pictures feature.

Overall, the suggested system architecture offers dementia patients an effective and dependable option. Doctors may use the system to monitor patient data and schedule visits, guardians can locate patients and send reminders, and patients can manage their daily activities and recollect memories. The system is reliable and efficient because to the use of Firebase ML Dependency and Firebase No-SQL database. Users may easily access and use the system thanks to the user-friendly and intuitive mobile application interface.

## 4. System Environment

The following are the hardware and software specifications used in this application.

A. Hardware Configuration
Processor: Pentium IV 2.8-GHz
RAM: 8 GB (Recommended)
Hard Disk Capacity: 4 GB

B. Software Configuration
Operating System: Windows 7 or later

IDE: Android Studio

SDK: Android Minimum SDK Version: API Level 21

C. Android Studio

Android Studio is the official integrated development environment (IDE) for Google's Android operating system. In the current stable version, the following characteristics are available.:

- Flexible build system powered by Gradle.
- Create rich experiences. Get rid of strenuous tasks. Create the best code.
- Template-based wizards to create common Android designs and components
- A visual layout editor that permits users to drag-and-drop UI widgets, and choose to sneak layouts on different screen configurations.
- Intelligent code editor

**D. TensorFlow Lite (TFLite)**

TensorFlow Lite (TFLite) is a lightweight framework developed by Google that allows you to run machine learning models on mobile and embedded devices, including Android devices. TFLite simplifies the process of running machine learning models on Android devices, allowing developers to create efficient and powerful AI-driven applications for a wide range of use cases.

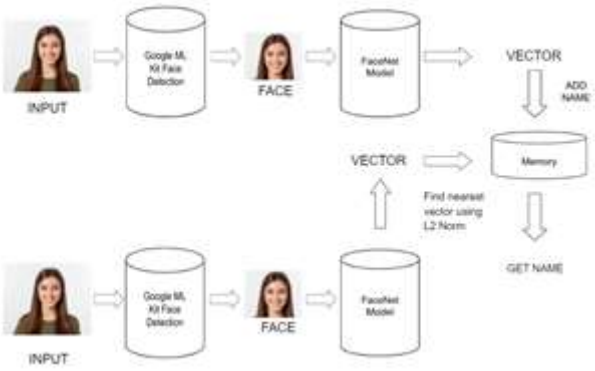


**Figure 4.1 Algorithm Demonstration**

**Face Recognition steps:**

1. Face Detection: This step involves detecting and locating faces within an image or a video frame. Various algorithms like Haar cascades, HOG (Histogram of Oriented Gradients), or deep learning-based methods (such as SSD, YOLO, or MTCNN) can be used for face detection.

2. Face Alignment: Once the face is detected, the algorithm may perform face alignment to normalize the face's position and orientation. This step aims to bring all faces to a standardized coordinate system to improve recognition accuracy.

3. Feature Extraction: In this step, facial features are extracted from the aligned face. Popular techniques include deep learning-based methods like Convolutional Neural Networks (CNNs), specifically designed for face recognition tasks. These networks can capture discriminative features that represent the unique characteristics of a face.

4. Face Matching: The extracted features are then compared with a database of known faces or a set of reference faces. Various algorithms such as Euclidean distance, cosine similarity, or SVM (Support Vector Machines) can be used for matching or classification. The algorithm determines the similarity or identity of the detected face based on this comparison.

## 5. Implementation

Patient Module:

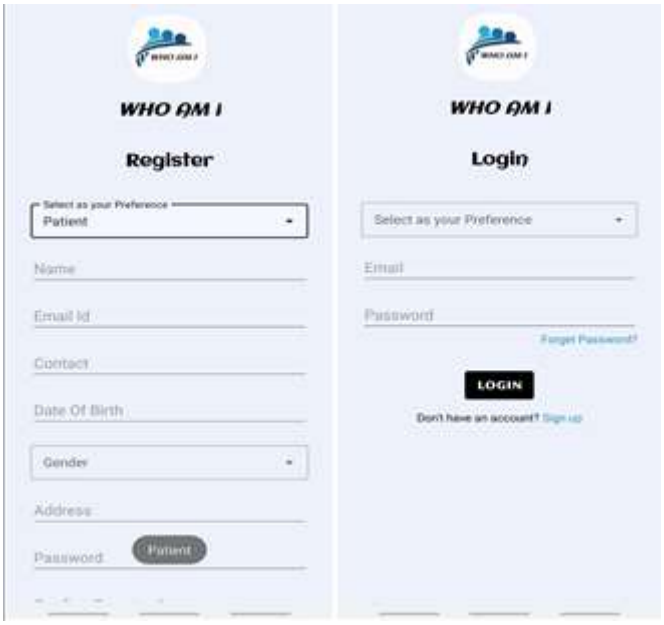


**Figure 5.1 Login and Registration Screen**

Here is a Registration page where three options are given as patient, guardian, and doctor as per preference then login page mail and password are the credential keys. For forgetting a passwordsystem sends mail to change the password on a verified email.

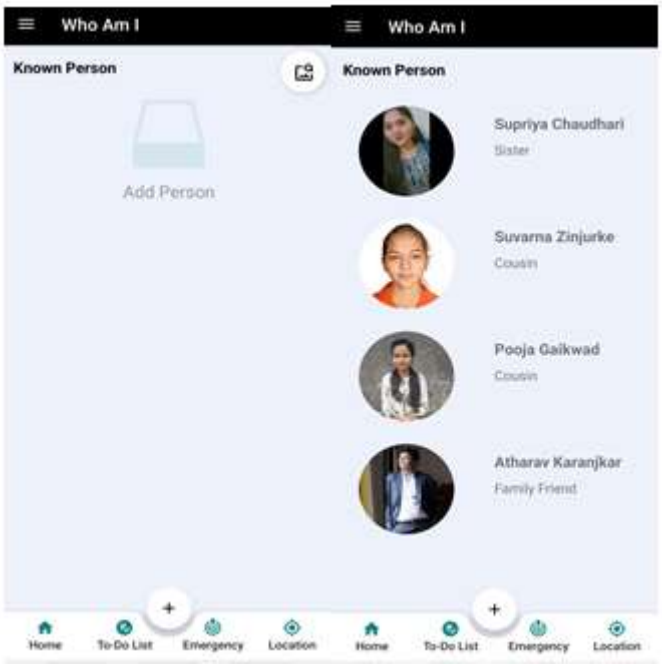


**Figure 5.2 Patient Dashboard**

After Login Patients Dashboard will appear where the patient can add any known persons data as relation and name just to remind later. The patient also can call if any emergency arises.

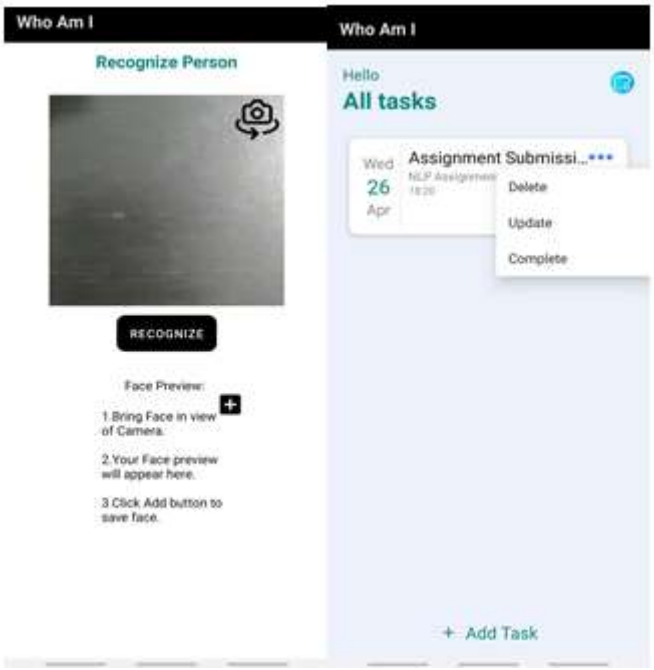


**Figure 5.3 Face Recognition and To-Do List Screen**

Face recognition module work for recognizing a face, by adding the image later on, a patient can just open the module and check is the person is known to him/her. To-Do page used for day-to-day life tasks. These tasks have status as delete, update and complete.

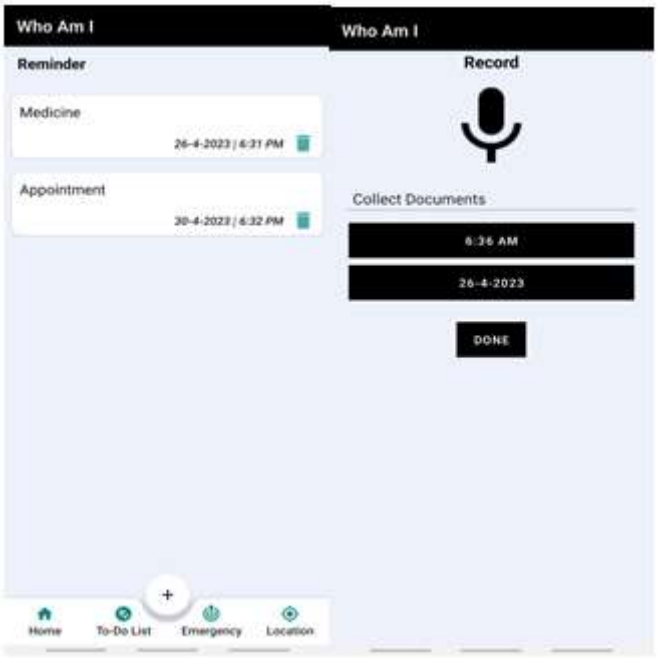


**Figure 5.4 Emergency Screen**

On the reminder activity, the patient can set reminders for further work. it gives a notification when an event is triggered. By using voice messages will automatically prompt on the screen. Also, appointment notification also appears here if any appointment is scheduled by Doctor.


**Figure 5.5 Emergency and Home Location Screen**

The emergency page in the patient' s module has emergency contacts which are set by the patient for instant calling purposes. The home Location Screen shows the home location is set by the patient.

**Guardian Module:**

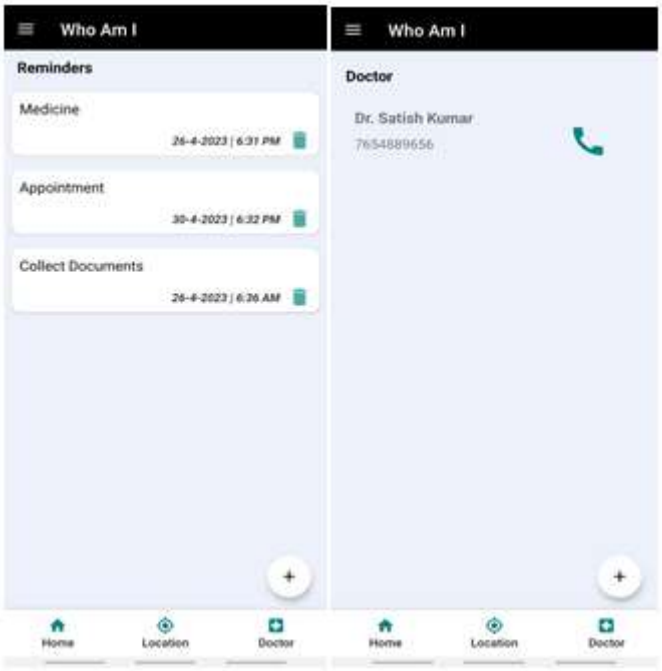


**Figure 5.6 Dashboard and Doctor Contact Screen**

Guardian module is an optional module as the idea is to make the patient independent but if the patient feels he/she needs a guardian so this module is usable.

Its dashboard work for setting reminders and checking reminders of the patient as per date and time. on the reminder saving page guardian can speak and set the reminder or else write and save. The Doctor Contact page is used for instant calling to the doctor at the time of emergency.

**Doctor Module:**

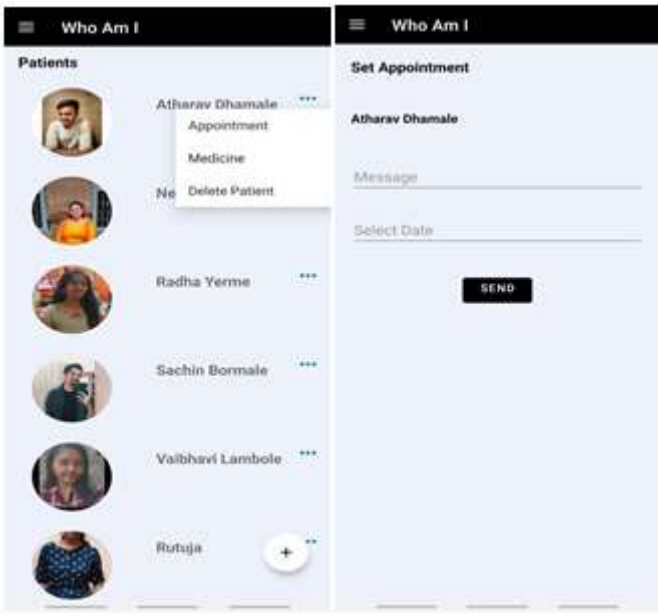


**Figure 5.7 Dashboard and Appointment Screen**

On Doctor' s dashboard, all the patient list appears. The doctor can set the appointment for the patient as per the parameters of the message and date. Once the appointment is set notification reminder will be reflected in the reminders section of the patient and guardian.

## 6. Result And Discussion

The innovative system developed by the researchers, leveraging mobile applications, cloud computing, and machine learning, has the potential to significantly improve the lives of people living with dementia and their caregivers. The system incorporates various features and functionalities to address the specific needs and challenges faced by individuals with dementia.

One of the key features of the system is the Android application designed to bridge the gap between patients and caregivers. By utilizing mobile devices, the application offers tools and features that promote independence and enhance the quality of life for individuals with dementia. The choice of Android as the operating system ensures accessibility for a wide range of users, given its widespread use and open-source nature.

The system is built on a foundation of Firebase cloud and MySQL ROOM database, which provide a secure and reliable framework for storing data. This ensures that sensitive personal information and medical history are securely managed and accessible whenever needed.

Leveraging cloud computing also enables seamless synchronization of data across devices, allowing both patients and caregivers to access and update information in real time.

Machine learning (ML) dependencies integrated into the system provide a unique feature for individuals with dementia - the ability to validate images of family and friends for memory retention. Memory loss is a common challenge faced by individuals with dementia, and this feature assists them in recognizing and recalling important people in their lives. By leveraging ML algorithms, the application can compare images with previously stored data and provide visual cues to support memory retention.

The system offers several essential functions that aid in managing daily life effectively. The Personal Information feature allows users to store and access crucial details, facilitating personalized care and treatment. The GPS Navigator feature provides real-time location information, enabling individuals with dementia to navigate safely and independently. The Doctor Involvement feature allows doctors to track patient progress and adjust treatment plans accordingly, leading to more personalised and effective care. The Emergency Button feature provides immediate access to emergency services, ensuring the safety and well-being of individuals in critical situations. The To-Do List feature assists with task management and organization, promoting independence and reducing cognitive load. Lastly, the Notification/Reminders feature sends alerts and reminders to users, helping them stay on track with appointments, medication schedules, and daily activities.

One of the most significant aspects of the system is the Doctor module, which empowers doctors to track the progress of their dementia patients. By providing real-time data insights, doctors can make informed decisions regarding treatment plans, medication adherence, and overall patient care. This module has the potential to enhance the quality of care for people living with dementia by enabling doctors to have a comprehensive understanding of their patient's conditions and make timely adjustments to their care plans.

In conclusion, the developed system demonstrates the potential to make a substantial positive impact on the lives of individuals living with dementia and their caregivers. By leveraging mobile applications, cloud computing, and machine learning, the system provides a range of features and functionalities tailored to the specific needs of dementia patients. The system promotes independence, enhances daily life management, and facilitates personalized care through

features such as memory validation, location tracking, doctor involvement, emergency assistance, task management, and reminders. The inclusion of the Doctor module empowers healthcare professionals with valuable insights, leading to more effective care and improved patient outcomes. With further advancements and refinements, this system has the potential to revolutionize dementia care and contribute to a better quality of life for those affected by the condition.

## 7. Conclusion

The highlights the development of an innovative system that integrates mobile applications, cloud computing, and machine learning to improve the lives of people with dementia. The system provides a range of features such as data storage, GPS tracking, medicine, and task reminders, as well as an alert/emergency button to ensure that patients can work in their comfort. The system's machine learning capability enables the validation of images of family and friends for memory retention, which can significantly aid dementia patients in maintaining their independence. Another notable aspect of this innovative system is the Doctor module, a new invention that allows doctors to track the progress of their dementia patients.

This module provides doctors with valuable data insights that they can use to adjust treatment plans, monitor medication adherence, and make informed decisions about the care of their patients. By providing doctors with real-time data about their patients, this module has the potential to improve the overall quality of care for people living with dementia. The researchers suggest that future work could involve integrating the system with voice assistance technology, which could further improve the system's usability and efficacy. Overall, this system has the potential to significantly enhance the quality of life for people living with dementia and their caregivers.

## Acknowledgement

We would like to express our gratitude towards guide Modern Education Society’ s College Of Engineering Pune for the useful comments, and remarks and for giving her valuable guidance and inspiration throughout the learning process of this project. And for making available all the facilities for the successful completion of this work and other staff members of the Computer Engineering Department for their valuable help.

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