

Memory support system for Alzheimer disease

Radhika Mandi¹, Manisha Bhalerao², Shweta Mutteparwar³, Rutushri Kumbhare⁴, Priya Gulhane⁵

¹ Professor at Department of Electronics and Telecommunication Engineering, Sinhgad Institute of Technology and Science, Pune-41.

^{2,3,4,5} Dept. Of Electronics and Telecommunication,
Sinhgad Institute of Technology and Science, Pune-41

¹radhikamandi@gmail.com,

²bhaleraomanisha93@gmail.com,

³mutteparwarshweta@gmail.com ,

⁴rutushrikumbhare101@gmail.com ,

⁵priyagulhane1997@gmail.com .

Abstract

This project helps to Face recognition. It is a medium for any humans interaction. A person must be able to recognize someone through their vision and memory. Unfortunately individuals who have memory disabilities often times suffer with their inability to recognize loved ones and close friends. The device presented in this project is specifically targeted to individuals with Alzheimer's disease, aiding their ability to recognize people using a face recognition model which matches the facial features of person with stored pictures of known people. The device identifies the person in front then output the person name and relationships to the users so that it is easy for any individuals with a memory disability to identify the people. the interact with the device is tasted using different platforms like raspberry pi3.

Keywords— Alzheimer Disease, Dementia, Face recognition, Computer aided diagnosis system

I. INTRODUCTION

Alzheimer's disease (AD) is a brain disease named and identified by Alois Alzheimer, German pathologist and psychiatrist and is progressive from dementia which is a slow and continuous decline in memory, thinking and analysis ability; or hallucinations and delusions, and is identified based on dense of protein layers deposited outside and between nerve cells and areas of damaged nerve fibres inside the nerve cells i.e. in Alzheimer's disease, brain size shrinks and the tissue has less number of nerve cells then connections which causes dementia.

In general, the first clinical aspect is the recent memory deficiency, however, the remote memories are preserved until a certain stage of the disease. In addition to the difficulties of attention and verbal fluency, other cognitive functions deteriorate as the disease progresses, among them the ability to perform calculations, visuospatial abilities and the ability to use common objects. The degree of alertness and lucidity of the carrier are not affected until the disease is advanced. Muscle contractures are an almost universal feature in the advanced stages of the disease, however, motor weakness is not observed. Statistically there is a high growth forecast for the diagnoses of the disease, especially in continents where the prevalence of the elderly population tends to increase a lot in relation to the present days. A population of over 65 million individuals with the disease is currently estimated and by 2050 this figure may exceed 115 million America is the continent with the highest prevalence of disease prevalence, with more than 500%, by 2050. Therefore, it is a disease of extreme relevance not only current but also future for Brazil.

Face recognition is a medium for any human interaction. A person must be able to recognize someone

through their vision and memory. Unfortunately, individuals who have memory disabilities often times suffer with their inability to recognize loved ones and close friends. The device is specifically targeted to Alzheimer's Disease patient, aiding their ability to recognize people using a face recognition model which matches the facial features of a person with stored pictures of known people. The device identifies the person in front then outputs the person's name and relationship to the user so that it is easy for any individual with a memory disability to identify the people they interact with the device is tested using different platforms like raspberry pi3.

II. LITERATURE REVIEW

In [1], the author proposed that Alzheimer disease is the most frequent neurodegenerative disease associated with age, with cognitive and neuropsychiatric alternation that result in progressive deficiency and eventual incapacitation. In addition to the difficulties of attention and verbal fluency, other cognitive functions deteriorate as the disease progresses, among them the ability to perform calculations, visuospatial abilities and the ability to use common objects. Therefore, the study of Alzheimer's disease is extremely important both for the cases already registered and for the diagnosis of new cases that will be computed. Within this, the article in question proposed the revision of a reliable database with the objective solidifying the understanding of the pathophysiological mechanism already know and those still proposed for the disease, as well as the drugs, the diagnosis and the treatment related to it. In order to generate an objective source of knowledge on the subject and highlight the new research focuses that seek to improve the treatment of Alzheimer's disease.

In [2], the author proposed that Alzheimer disease, a neurological disorder wherein the demise of brain cell roots loss of memory. Low brain activity and blood flow causes the disease. Various images processing technique has been used for identifying Alzheimer disease from brain image database. Alzheimer disease is a brain disease named and identified by Alois Alzheimer, German pathologist and psychiatrist and is progressive from dementia which is a slow and continuous decline in memory, thinking and analysis ability or hallucinations and delusions, and is identified based on dense of protein layers deposited outside and between nerve cells and areas of damage nerve fibers inside the nerve cells. Though the exact diagnosis of Alzheimer disease is impossible till moderate to severe cortex damage has occurred, by using the various image processing techniques on the image acquired by any of the medical image modality an Alzheimer region can identified.

In [3], the author proposed that The device targeted to individuals with Alzheimer's Disease, aiding their ability to recognize people using face recognition model which matches the facial features of a person with stored pictures of known people. Face recognition is a medium for any human interaction. Person must be able to recognize someone through their vision and memory. Unfortunately, individuals who have memory disabilities often times suffer with their inability to recognize loved ones and close friends. The device presented in this paper is specifically targeted to individuals with Alzheimer's Disease, aiding their ability. The device identifies the person in front then outputs the person name and relationship to the user so that it is easy for any individual with a memory disability to identify the people they interact with.

In [4], the author proposed that Alzheimer's disease represents an enormous global burden in terms of human suffering and economic cost. It is the most common cause of dementia all over the world. The pathological hallmarks of Alzheimer's disease are amyloid plaques and neurofibrillary tangles. The goal

of this review is to discuss early diagnosis using biomarkers, machine learning and newer treatment strategies for Alzheimer's disease. Newer strategies focus on employing disease modifying agents targeting amyloid cascade. The aim of such treatment is to reduce amyloid production, prevent tau hyperphosphorylation, aggregation and improve clearance of both tau and amyloid. Cholinesterase inhibitors and Memantine are the only drugs approved for treatment as yet. Although they improve symptoms they do not cure or totally halt the progression of illness. Nutritional supplements, physical activity plays a role in prevention according to few studies, but their role has not yet been approved.

III. OBJECTIVE AND AIM

1. To create a database of relatives and friends as follows.
2. To capture at least 15 images by webcam or Pi camera.
3. To identify the relation with patient, by comparing two images using normalisation techniques.
4. To display the final result on LCD in the wristband of patient.

IV. METHODOLOGY

A. USB Webcam or pi camera

It attaches to Pi by way of one of the small sockets on the board upper surface and uses the dedicated CS interface, designed especially for interfacing to cameras. Features: Fixed focus lens on-board 8 megapixel native resolution sensor-capable of 3280 x 2464 pixel static images.

B. Raspberry pi3 MODEL B

The Raspberry Pi just got juicer! Now with a Quad-Core 64bit CPU, Wi-Fi & Bluetooth! The Raspberry Pi 3 Model B is the third generation Raspberry Pi. While maintaining the popular board format the Raspberry Pi 3 Model B brings you a more powerful processor, 10x faster than the first generation Raspberry Pi.

C. Power supply

A power supply is a component that supplies power to at least one electric load. Typically, it converts one type of electrical power to another, but it may also convert a a different form of energy – such as solar, mechanical, or chemical - into electrical energy.

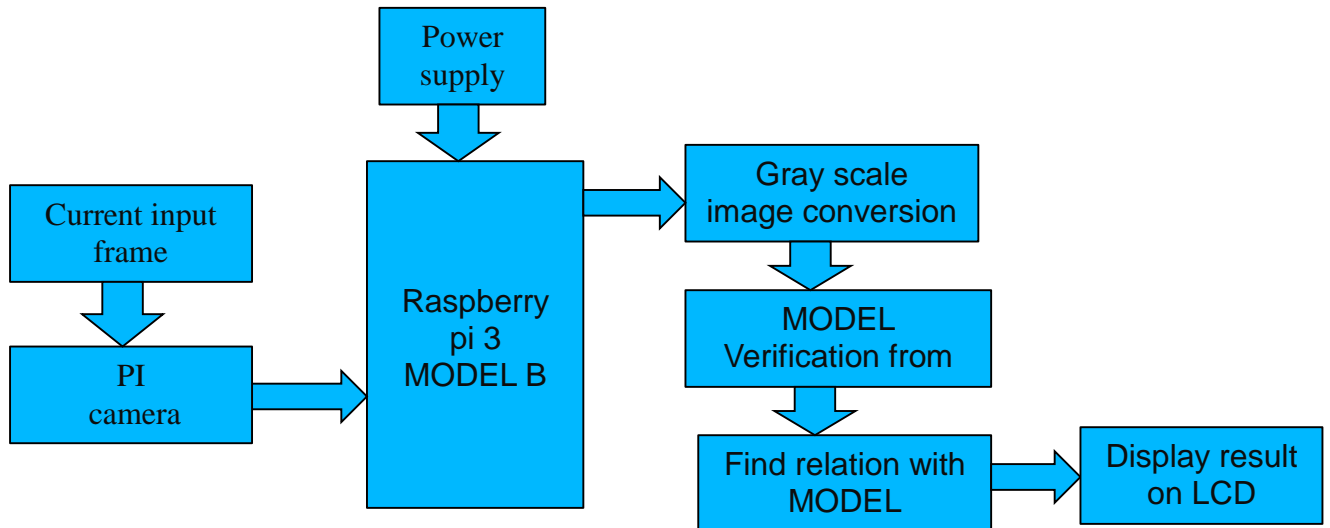


Fig: Proposed Block Diagram

D. Gray scale image conversion

In digital photography, computer generated imagery and colorimetry, a grayscale or greyscale image is one in which the value of each pixel is a single sample representing only an amount of light, that is, it carries only intensity information. Grayscale images, a kind of black and white or gray monochrome, are composed exclusively of shades of grey. The contrast ranges from black at the weakest intensity to white at the strongest. Grayscale images are distinct from one-bit bi-tonal black-and-white images which, in the context of computer imaging, are images with only two colors: black and white (also called bi level or binary image).

Grayscale images have many shades of gray in between

E. MODEL verification from database

In computer science, data validation is the process of ensuring data have undergone data leansing to ensure they have data quality, that is, that they are both correct and useful. It uses routines, often called "validation rules" "validation constraints" or "check routines", that check for correctness, meaningfulness, and security of data that are input to the system. The rules may be implemented through the automated facilities of a data dictionary or by the inclusion of explicit application program validation logic routines", that check for correctness, meaningfulness, and security of data that are input to the system. The rules may be implemented through the automated facilities of a data dictionary or by the inclusion of explicit application program validation logic

V. CONCLUSION

In this paper we describe that a face detection system using Raspberry Pi will be developed. This system will develop for only those patients who are suffering from Alzheimer disease. The system uses Python programming language. Both real

time face detection and face detection from specific images, that is object recognition will be carried out.

Also we have implemented image processing algorithm to detect and analysis human faces and storing of data in database.

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Author Profile

Prof. R. M. Mandi

Bachelor of Engineering (Electronics And Telecommunication), Master of Engineering (Electronics And Telecommunication), Sinhgad institute of technology and science, Pune-41.

Ms. Manisha Bhalerao

Bachelor of Engineering (Electronics and Telecommunication), Savitribai Phule Pune University, Sinhgad Institute Of Technology And Science, pune-41

Ms. Shweta Muttepar

Bachelor of Engineering (Electronic and Telecommunication), Savitribai Phule Pune University, Sinhgad Institute Of Technology And Science, Pune-41.

Ms. Rutushri Kumbhare

Bachelor of Engineering (Electronics and Telecommunication), Savitribai Phule Pune University, Sinhgad Institute Of Technology And Science, Pune-41.

Ms. Priya Gulhane

Bachelor of Engineering (Electronics and Telecommunication), Savitribai Phule Pune University, Sinhgad Institute of technology and science, Pune-41.