Journal of Science and Technology
ISSN: 2456-5660 Volume 06,Special Issue 01, August 2021,

www.jst.org.in *DOI: https://doi.org/10.46243/jst.2021.v6.i04.pp83-88*

Memory Aid Device for Alzheimer Patients

S.D. Sawant[1], Shivraj Gawande[2], Sakshi Thorat[3], Shradha Gundawar[4]
[1-4](Department of Electronics and Telecommunication, NBN Sinhgad School of Engineering/ SPPU. Pune, India)
Corresponding Author: sharad.sawant@sinhgad.edu

To Cite this Article
Sakshi Thorat , Shradha Gundawar and Shivraj Gawande, "Memory Aid Device for Alzheimer Patients", Journal of Science and Technology, Vol. 06, Special Issue 01, August 2021, pp83-88.

Article Info
Received: 15.07.2021 Revised: 24.07.2021 Accepted:10.08.2021 Published: 16.08.2021

Abstract: *Alzheimer's disease Is a devastating illness that affects a large number of elderly individuals today. Taking care of Alzheimer's sufferers can be physically and mentally taxing. At the same time, it's critical to give patients the freedom to live independently. The most well-known type is Alzheimer's disease, which destroys the individual's memory, making the well-known encompassing new for them. People with Alzheimer's disease have a harder time remembering things, thinking clearly, communicating with others, or dealing with themselves, and they don't always react when their name is called. Dealing with people who have Alzheimer's disease is extremely difficult and hard for their families. This illness frequently causes wandering, which is a source of concern for many families who are concerned that the patient will become lost or get into dangerous situations.*

Key Word*: Raspberry Pi 3B model, Picamera, Face Recognition, Twilio.*

I. Introduction

Dementia is the most frequent neuropsychiatric condition, affecting a huge percentage of the world's old population. It primarily impairs memory and cognitive skills. Alzheimer's disease is a more particular type of dementia because it primarily impairs a person's memory. Memory loss is a sign that Dementia disease is developing.
The increased risk of falling among the elderly is a possible source of damage. Falls at this age result in fractures, which can cause rapid health deterioration and, in some cases, death. The most prevalent reason is when a senior citizen who uses a walking assist forgets to use it while walking. When an elderly person has Dementia or Alzheimer's disease, the danger increases dramatically. If an old person has Dementia, family or nurse should have taken care of them if they are alone. When elderly people with dementia or Alzheimer's are left alone, they become disoriented and confused. The necessity of the hour is for a gadget that can handle these concerns. Various existing devices make use of technology that are either complicated or unreliable. When compared to existing systems, this module aims to be more feasible and user friendly. The cost savings are achieved by combining existing software and hardware infrastructure to provide the most reliable service for our requirements. Only a Raspberry Pi and a portable power supply for the Raspberry Pi will be used in the system.

II. Material And Methods

Dementia is a broad term for a loss of mental ability that interferes with daily routine. The well-known form of dementia is Alzheimer's disease. The well-known symptom is memory loss. The loss of memory disease progresses makes every day routine not possible without the assistant, most frequently a family member or friend.

Literature Survey: Now a days, approximately 7.8 million cases of Dementia are immerging each year. The prevalence of dementia rises with increase in age, with the highest increase occurring after the age of 70. Reminding Name with face Memory in People with this Disease is a device that is targeted to people with such Disease, Rising ability to recognize person by use of a recognition model that match a person's face feature with collected images of known people. The module will click the picture of the man/women in front of it and after that displays the name of

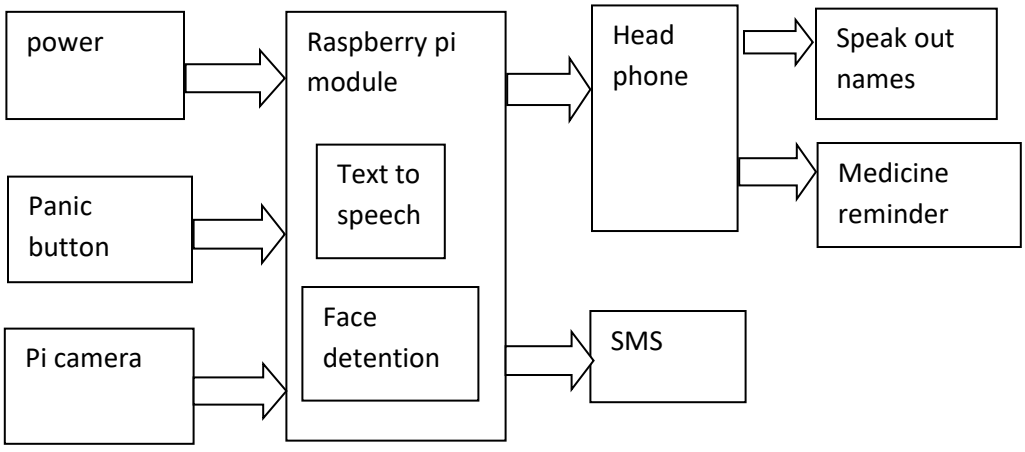
person and any more information collected in the dataset , making it simple for anyone with a disorder to recognize the persons they meet or interact with. An application was created that allowed to family to send photos, videos , and music to their user to remind them of something important in their daily routine. Such smartphone apps may allow a patient to be occupied at all times. However, this was limited by the Android tablet's touch sensitivity. It does not include GPS tracking or any other device to address the patient's wandering problem. It does not make the patient self-sufficient, instead it requires a human operator to operate the app and attend to the patient's requirements. Building this device for offering personal assistance to Alzheimer's patients is the gadget adopted can virtually aid an Alzheimer's patient in their everyday living to enable them lead a good life at some. This will assist a person in gathering & processing information, as well as having a GPS to track a person. Visual aids, particularly images, can assist persons with Alzheimer's disease stimulate memories, & this is true for those in starting stages of this disease as well as those with last stage of Alzheimer's. Reminding SMS can be useful in a variety of situations, such as reminding people to take their medications.

Objectives: The goal of this project is to create a device for Alzheimer's patients to use at home that would operate as a virtual helper in their daily routines. The device will take information, process it, and aid the patient autonomously while running on a Raspberry Pi mini-computer. Patients with Dementia must be able to use this device to live more independently.
Goals: 1. The weight of the item should be less than one pound. 2.The battery should be maintained for at least one hour. 3.Should receive a score of 56-60 in the Testing Criteria. 4.The device should interact with the patient, such as through the use of a headset to communicate with the patient.

Proposed Methodology:
1.The Pi-camera will capture the image of someone who is opposing the patient
2. The face will then be compared to a database of people stored in the Raspberry Pi memory.
3.We must use the face recognition module.
4.We are using the Google text-to-speech library to express the patient's title into connected headphones.
5. In the event of a panic attack, the patient can press the panic button to send an alert SMS to a close relative.

Block Diagram:

Figure No 1: block diagram.



Hardware implementation:

1.The Raspberry Pi is a mini computer made in the United Kingdom by the
Raspberry Pi foundation to teach elementary computer science to school students and anyone else interested in computer
hardware, programming, and DIY-Do it Yourself projects.
2.The Raspberry Pi is produced in three panel formation via licensed manufacturing agreements with Newark element14, RS Components, and Ego man. These businesses sell the Raspberry Pi on the
internet.
3. Ego man constructs a type for supply only in China and Taiwan, which is different from other Pics
by its red color and deficiency of FCC/CE markings.
4. Every manufacturer uses the same hardware. The Raspberry Pi is powered by a Broadcom BCM2835 system on a chip (SoC), which contents an ARM cortex A53 processor, Video Core IV GPU, and 1GB of RAM (Model B+).
It lacks a hard disc, then it does use an SD card for striking and persistent storage, help of
Model B+ use with a MicroSD.
5.The Basic offers downloads of the Debian and arch Linux arm construction. Python is the primary
programming language supported, with provision of BBC elementary (via the risc os image or the brandy basic clone for
Linux), c, java, and Perl.

Software Implementation:

Raspbian is one of the Best All-Around Operating System
Raspbian is the official running machine of RaspberryPi and due to this, the only maximum humans will have needed initially Raspbian is a model of Linux constructed particularly for the Raspberry Pi. It will be filled with most of the software programs you will want for each primary venture with a PC. We will get Libre Office as a workplace suite, an internet browser, electronic mail program, and a few gears to educate programming to youngsters and adults alike. Heck, it even consists of a special (now not in development) model of My craft. Raspbian is the spine for quite an awful lot each DIY mission to build something, Raspbian is maximum possibly wherein you need to start. Cause it is so openly used, it's additionally smooth to locate publications and troubleshooting operation.

WHAT ARE NOOBS?

The Raspberry Pi itself doesn't include a running machine. For that, you want NOOBS, brief for New Out of the Box Software. It's a running machine supervisor which made it smooth to download, install, and installation your Raspberry Pi. When you first boot up NOOBS, you'll get a choice of OSes to pick out from. Which running structures are to be had relies upon on which version of Raspberry Pi you're using. For this guide, we'll keep on with the maximum not unusual place OSes running structures to be had at the most up-to-date fashions of the Raspberry Pi.

OPENCV

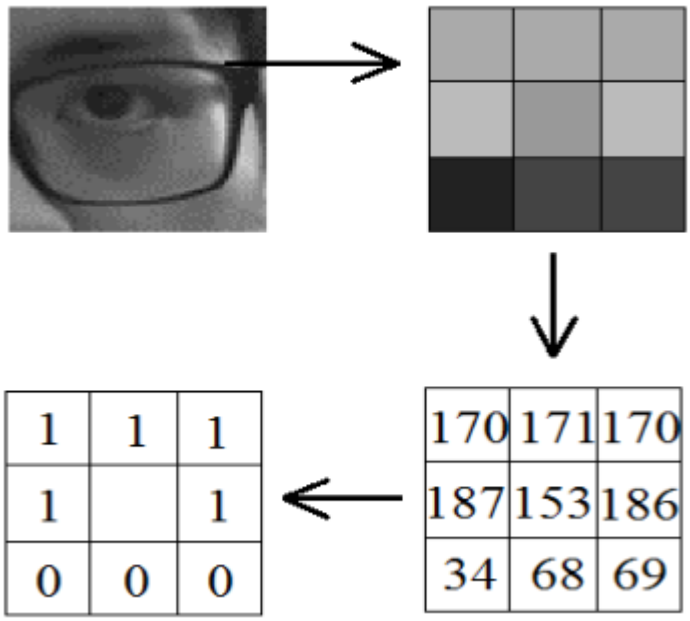
Open CV helps an extensive form of programming languages consisting of C++.Combining the first-rate characteristics of the Open CV, C++, API and Python language. OpenCV is a library of python bindings construct to remedy laptop imaginative and prescient problems. Python is widespread cause programming language began out via way of means of Guido van Rossum that have become very famous very quickly, especially it's easy to use and code clarity used to build. It allows the developer to express their thoughts in few lines of code while maintaining clarity. Compared to languages like C/C++, Python is slow.

The LBP set of rules for face recognition:

The LBP set of rules on this gadget applied to recover the nearby capabilities from the enter dataset. An example is provided to highlight its functional flow. To begin, every picture in the schooling series is removed and divided into M x N units. Afterwords, each pixel in every Mobil Eular recovers the Eigen cost of LBP this is described inside a

3x3 pixel region. The middle pixel serves as a reference factor for evaluating the gray scale**.** If the gray levels of an adjacent pixel increase the reference factor, the pixel is set to 1as default; otherwise, it is set to 0.

Figure No 2: Block diagram of LBP.



The translation of LBP is demonstrated in the diagram. The image is initially separated into numerous cells and a 3x3 pixel region is removed. The reference point is center pixel. It has a gray-scale value of 153. The grayscale values of its nearby pixels are also computed and compared to the point of reference. The value is set to 1 if it is greater than 153; else, it is set to 0. The binary 11110001 is transformed to the decimal 241, where is the reference point of LBP value, by visiting in a clockwise direction. The pixels on the 3x3 pixel boundaries yield 8 bits, which is only one byte in size.

We will get the LBP value of the pixel in the mid of the 3x3 pixels by sorting and reordering the produced bytes. The outcome can be estimated as follows: (2). (2) where (xc, yc) is the measuring point's location, p is the point surrounding the midpoint, and g is the grayscale value. After that, each cell's LBP value is determined. It's also to figure out how often the LBP value of every point in each cell appears. This cell's histogram results have been adjusted. Finally, all

of the cells' LBP histograms are formatted into a feature vector. The picture is then separated with the help of the K-nearest Neighbour (KNN) method. It finds the neighboring LBP eigenvectors using the Euclidean distance.
LBP operation stages:

Stage1: Recover all the face pictures from the data set.

Stage2: separated every picture into M x N cells.

Stage3: measure the LBP histogram of every cell.

Stage4: Add the LBP histograms of every cell to get the Eigenvectors of the face picture.

Stage5: Figure out the Euclidean range of the eigenvector of input picture with the pictures in data set.

Stage6: Use the results of K-NN to fix the sorting for recognition.

III. Conclusion

A new method for education the reminiscence of someone tormented by Alzheimer disorder has been proposed. The outcomes of this technique display the assessment of pics captured via way of means of Pi-digital digicam with the pics saved withinside the dataset. This facilitates the affected person to apprehend the man or woman in the front of him and facilitates him in a manner to speak with that man or woman.

References

[1] Pritam Raj Kumar Patil; Sunita Deshmukh Memory Aid Device for Alzheimer's Patient 2019 5th International Conference On Computing, Communication, Control And Automation (ICCUBEA).

[2]. TheHindu:12. http://www.thehindu.com/news/cities/Hyderabad/many-unaware-of-alzheimers-disease-in-india/article5390719.ece. Accessed 27 Jan 2017 (2017).

[3] . Chandra, V., Pandav, R., Dodge, H.H., Johnston, J.M., Belle, S.H., DeKosky, S.T., Ganguli, M.: Incidence of Alzheimer's disease in a rural community in India The Indo-US Study. Neurology **57**(6), 985–989 (2001)CrossRefGoogle Scholar

[4] Chandra, V., Ganguli, M., Pandav, R., Johnston, J., Belle, S., DeKosky, S.T.: Prevalence of Alzheimer's disease and other dementias in rural India The Indo-US study. Neurology **51**(4), 1000–1008 (1998)CrossRefGoogle Scholar

[5] Pandav, R.S., Chandra, V., Dodge, H.H., DeKosky, S.T., Ganguli, M.: Hemoglobin levels and Alzheimer disease: an epidemiologic study in India. Am. J. Geriatric. Psychiatry **12**(5), 523–526 (2004)CrossRefGoogle Scholar

[6] Niamh Caprani, John Greaney, Nicola Porter "A Review of Memory Aid Devices in Aging People"