

# Accessibility Using Human Face, Object and Text Recognition for Visually Impaired People

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**Abstract:** *Visually impaired people are one among the extremely strong on this planet since they smell, hear and sense to lead their successful life. They are sufficiently striking with the end goal that they have gone into the field of interest. Additionally, there is a great deal of duty regarding them to lead their day by day happenings with the authorized people, their articles and their documents. As per their enthusiasm for some fields is here where they can ready to practically observe the happenings of the world through the eyeglass. In this world, the numerous blind people and some by accidentally way lost their vision. So as to credit their state of mind this development gives data of the client questioned scenes through a sound stream. This helps blind people to survive like normal people in different environments.*

**Index Terms:** *Discrete Warier Transform, Discrete Cosine Transform), SURF (Speeded-up Robust Features), OCR (Optical Characteristics Recognition), RFID (Radio Frequency Identification).*

## I. INTRODUCTION

In this world, innovation is growing yet not for visually impaired individuals. So, this application will be useful for visually impaired individuals. With the goal, that they can perceive the human face like companions. Furthermore, the content acknowledgment can ready to peruse the reports. What's more, the question acknowledgment is to figure out which sort of protest. In this undertaking, advancement, and execution of calculation is so quick. Worldwide there are numerous regular blinds and some by the unplanned way have lost their vision. So as to credit their state of mind this development gives data of the clients questioned scenes through a sound stream.

The existing system provides a camera coat as a unit that will be held by the outwardly tested for utilize. The camera centers shape the inside chest and record the video stream of nature. The recorded video edges will be checked with the datasets of the framework to check for an impediment. The calculation's preparing is done at the advanced cell and sound stream of the separated snag is sounded through a headphone. This framework needs protest as either typical or

critical. For human face principal component analysis, Object scale-invariant feature transformation and for text, an optical character recognition algorithm is used. Discrete Wavelet Transform is computationally proficient and can be actualized by utilizing basic channel convolution. With multi-determination investigation, the picture can be spoken to at in excess of one determination level. Wavelets enable the picture to be depicted in the wording of coarse general shape and points of interest going from expansive to limit. The magnitude of DWT coefficients is bigger in the most minimal groups (LL) at each level of disintegration and is littler for different groups (HH, LH, and HL). The bigger the greatness of wavelet coefficient, the more critical it is. Watermark location of bringing down resolutions is computationally powerful in light of the fact that at each progressive determination level, less no. of recurrence groups is included. High determination subgroups help to effortlessly find edge and surfaces designs in a picture.

The SURF highlight is an accelerated form of SIFT, which utilizes an approximated and the necessary picture trap. The indispensable picture technique is fundamentally the same as the strategy utilized as a part of the popular Viola and Jones' confront indicator. A basic picture, in spite of its pretty name, is only a picture in which every pixel has the whole of all the first pixel esteems left or more it. The upside of the vital picture is that after a picture is processed into a necessary picture, it can figure square subtraction between any 2 obstructs with only 6 counts. With this preferred standpoint, discovering SURF highlights could be a few requests quicker than the conventional SIFT highlights.

OCR preparing can greatly enhance your client administrations. On the off chance that you accept approaching calls which expect you to get to records at that point having those reports accessible quickly in the advanced frame can improve the general client encounter because of the speed of looking for the documents they require and the capacity to alter their substance effectively.

## II. RELATED WORKS

This record depicts a haptic application that permits daze individuals to perceive three-dimensional (3D) questions that exist in virtual condition. The framework enables dazzle individuals to touch, get a handle on and control questions that exist in the hap-tic empowered VE [1].

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The framework is outlined keeping in mind the end goal to give an elective method for human PC connection to daze clients.

Electronic Travel Aids, which change visual ecological prompts into another tangible methodology, have been demonstrated to enable outwardly weakened individuals to movement with a more prominent level of mental solace and autonomy. The People Sensor is an Electronic Travel Aid intended to address two issues of significance to outwardly impeded individuals: incidental stick contact with different walkers and questions and addressing a man who is never again inside hearing extent. The gadget utilizes pyroelectric and ultrasound sensors to find and separate between invigorate (human) and lifeless (non-human) checks in the recognition way [2]. The separation between the client and the hindrance, alongside the idea of the deterrent (human or non-human), is transmitted through regulated vibrotactile criticism. Equipped with propel learning of the nearness and area of articles and individuals in the earth, clients of the People Sensor can go with expanded freedom, security, and certainty.

These authors [3] are presented constant impediment identification and arrangement framework intended to help outwardly hindered individuals to explore securely at indoor and outside fields, by taking care of a cell phone gadget. They begin by choosing an arrangement of intrigue focuses removed from a picture framework and followed utilizing the multiscale calculation. At that point, gauge the camera and underpinning movement through an arrangement of homographic changes. Different sorts of developments are distinguished utilizing an agglomerative grouping strategy. Impediments are set apart as critical or ordinary in light of their separation to the subject and the related movement vector introduction. Following, the distinguished obstructions are encouraged/sent to a protest classifier.

These proposals [4-7] trace usage of RFID for a transport location component to help dazzle in making a trip starting with one place then onto the next. By and large, travel in transport is a safe and solace factor however route in open air situations is profoundly troublesome for the individuals who have an innate visual deficiency or visual impairment from an exceptionally youthful age. A few arrangements have been proposed like strolling stick or white stick manage canines and GPS rules to manage this trouble. Albeit some of them have appeared to be helpful in genuine situations, they include an imperative organization exertion or utilize relics that are not normal for dazzle clients. Subsequently, this paper intends to build up a transport discovery model utilizing Radio Frequency Identification (RFID) for daze. RFID can possibly be a valuable guide with assist institutionalization of RFID labels and change of current RFID peruse. Interfacing peruse with a microcontroller (ATMEGA328-PU), utilizing IR sensor for remote correspondence configuration helps in enhanced route.

Numerous investigations have built up the need and utility of available urban transport framework for outwardly impeded people. Nonetheless, most open transportation frameworks, particularly in the creating nations, are not available and this is regularly recorded as one of the significant bottlenecks for social and monetary consideration of outwardly hindered. On Board, the transport

distinguishing proof and homing framework have been produced to address these necessities. A radio-recurrence based, totally client activated framework encourages the client initially to recognize the course number and after that empowers the client to board the transport utilizing the sound-related prompts from the passageway of the transport. This investigation examines a quantitative assessment of genuine field testing that surveys the viability in empowering free boarding of open transports. Further, it additionally portrays particular prerequisites that got recognized amid the trial stage. Additionally there is a need to discuss the plan upgrades which empower the establishment of the transport module in fluctuating transports of various specialist organizations. The target of our examination has been to produce observational confirmation that would encourage the move towards fuse of such a framework in broad daylight transports internationally. The positive input got affirms that the framework empowers free access to the outwardly disabled without bargaining on their security.

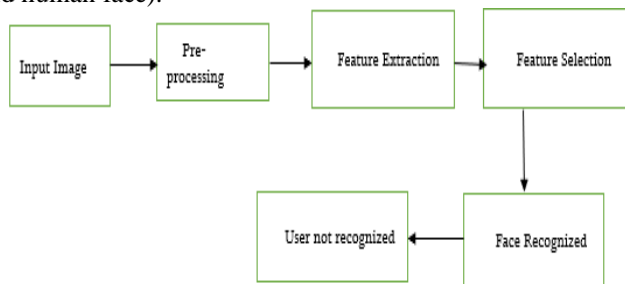
The visually impaired abilities to explore in a specific place and to sort out their day by day exercises are of key significance for their wellbeing and prosperity. Sorting out any sort of basic day by day movement can be particularly troublesome; it is difficult for the heedless to recognize the distinctive things, for example, bundled substances and medication holders just by touching with their hands. RFID, or radio recurrence ID, is an [8] innovation that can give help to enhancing the association and introduction amid the sunlight exercises.

RFID utilizes radio waves to convey information from a tag, which stores data to peruse, which can expand the data deciding. This innovation is exceptionally helpful in a wide range of settings, for example, filtering identifications, shipments, and programmed parkway toll gathering. In this paper [9], an RFID gadget composed as a help for the visually impaired in looking through a few items is displayed; specifically, it has been created for looking through the drugs in a bureau at home. The gadget can give to the visually impaired a few snippets of data about the separation and improve the pursuit; other than distinguishing the prescriptions, the gadget can give the client an acoustic flag keeping in mind the end goal to discover effortlessly the coveted item at the earliest opportunity.

Outwardly disabled individuals, so as to comprehend printed or transcribed media, require the material to be available in Braille. They additionally require a comprehension of the Braille dialect. The proposed framework rather utilizes different faculties that outwardly tested individual has, for example, the capacity to tune in and change over the printed material. By this version, the blind people can attend the exams by using PENPAL, no need of the third party to write for their exams. But the drawback of [10], they lack Braille languages.

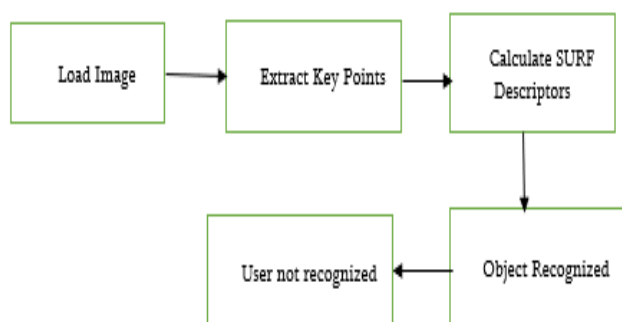
### III. PROPOSED ACCESSIBILITY USING HUMAN FACE, OBJECT AND TEXT RECOGNITION

The proposed innovation presents the idea of the eyeglass containing the camera for taking the previews of the visually impaired environment. The taken depictions are prepared with the relating calculation and an applicable content report of that picture is recovered. What's more, the content report is changed over to a sound record and sounded at the earphone. In the proposed system human face is discrete warier transform, object speeded up robust feature and for text, and optical character recognition is used. When compared to the existing system, optimization of the algorithm is good and the user can hear which type of objects (i.e. name of the object and human face).



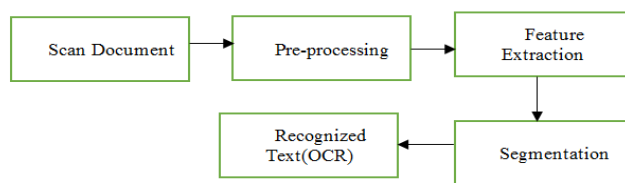
**Fig.1. The proposed framework for Human Face Recognition**

As in Fig.1 the preprocessing step, it starts with catching the pictures from the camera. At that point, apply Face Detection system utilizing Viola Jones to that face picture to trim the face with no foundation data. Discrete Wavelet transform (DWT) is utilized to discover the component extraction, for test pictures. In this Human Face Recognition procedure, a diverse arrangement of pictures is taken by the camera. These all pictures are utilized to made databases. DWT is utilized to discover the element extraction, for database pictures. Then find Euclidean Distance amongst database and test picture highlights. It is utilized to check whether the individual is in the database or not.



**Fig.2. The proposed framework for Object Recognition**

As referred in Fig.2 the SURF has increased wide fame in numerous PC vision applications. It has been appeared to have higher exactness and speed in contrast with other element descriptors with regards to protest acknowledgment



**Fig. 3. The proposed framework for Text Recognition**

As in Fig. 3 the segmenting content from an unstructured scene significantly assists with extra undertakings, for example, optical character recognition (OCR). The mechanized content recognition calculation in this illustration identifies a substantial number of content area applicants and dynamically expels those less inclined to contain content. An applicable content report of that picture is recovered. Also, the content archive is changed over into a sound record.

### IV. RESULTS AND DISCUSSION

Fig. 4 depicts that sample data set which is trained and VIOLA JONES techniques are used to remove the unwanted information by crop the face without any background information.



**Fig. 4. Sample Dataset for Face**

The faces are recognized, and it performed by using discrete warier transform algorithm. If the person is recognized by the user, then it's an authorized person by the user. If it is not recognized by the user, then it is not an unauthorized person. The output will generate by voice and text box as shown in Fig. 5 and Fig. 6.

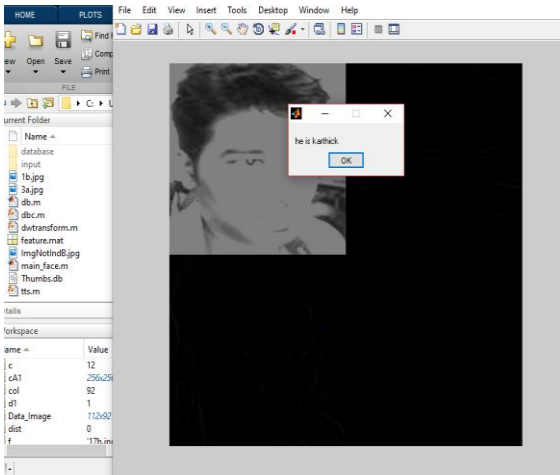


Fig. 5. Human Face Recognition

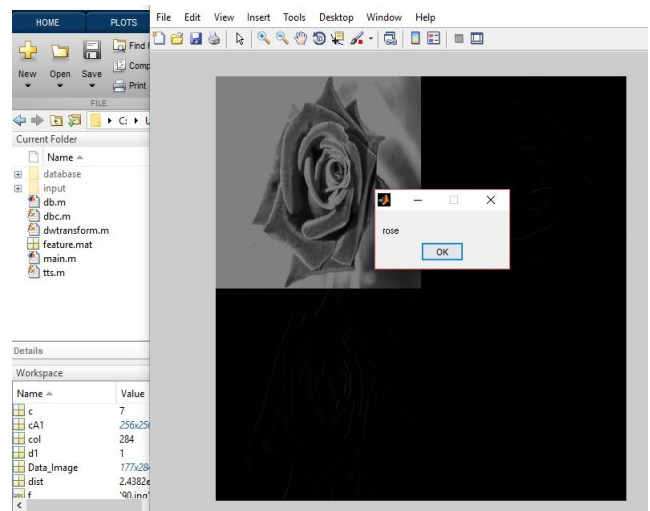


Fig. 8. Authorized Object

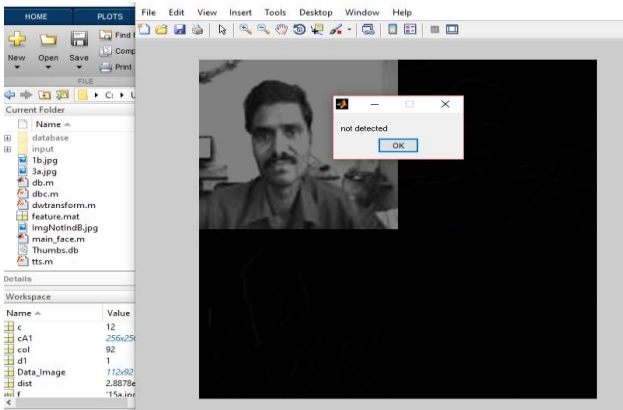


Fig. 6. Unauthorized Use

Fig.7 shows that a sample data set which are trained. VIOLA JONES technique is applied to remove the unwanted information. The objects are recognized, and they performed by using the SURF algorithm. If the object is recognized by the user, then it's an authorized object by the user. If it is not recognized by the user, then it is not an unauthorized object. The output will generate by voice and text box as shown in Fig.8 and Fig.9.

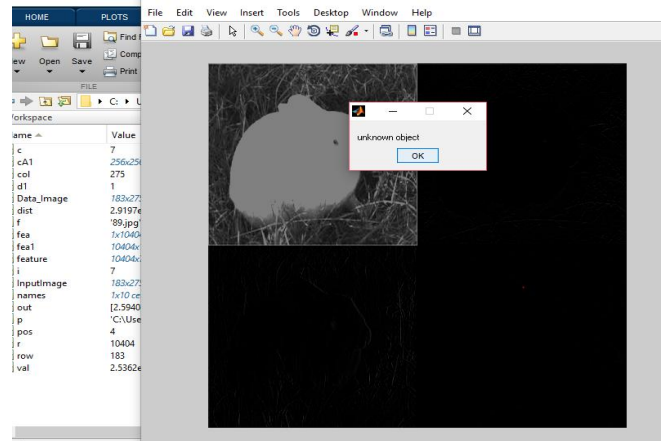


Fig. 9. Unauthorized Object



Fig. 7. Sample Dataset for Object

The image will be converted into text and the text converted into an audio stream. The audio stream by using text to speech conversion in text recognition refer Fig.10.

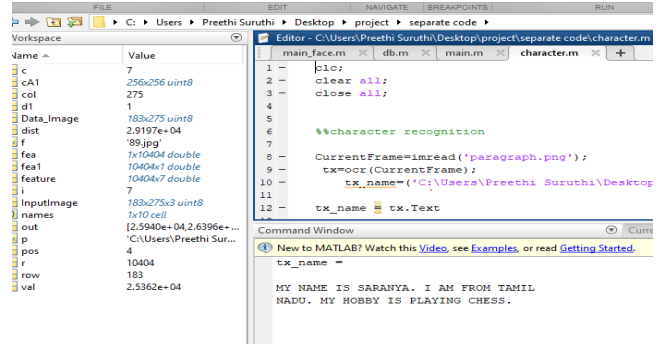


Fig. 10. Text Recognition

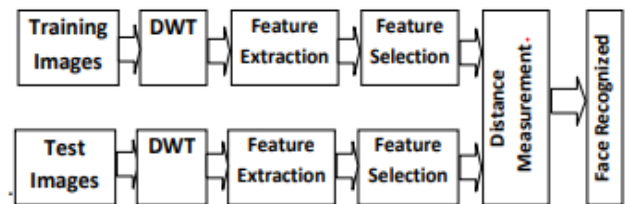


Fig. 11. Workflow of DWT



The optimization of the algorithm is good in DWT when compared to DCT (i.e., the red represents DCT and blue represents the DWT in Fig.13). Because in DCT have to perform their coefficients to test the images. But in DWT decomposed and define the process and test the images as shown in Fig.11 and Fig.12.

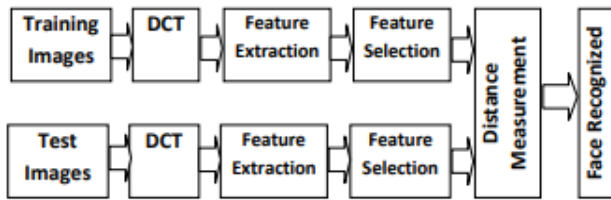


Fig. 12. Workflow of DCT

Here the comparison of the algorithm is like DWT and DCT as shown in Fig.13. The drawbacks are overcome by proposing modified DWT algorithm which used the formulated to recognize the human face. This work demonstrates modified DWT recognized by increasing well-known persons.

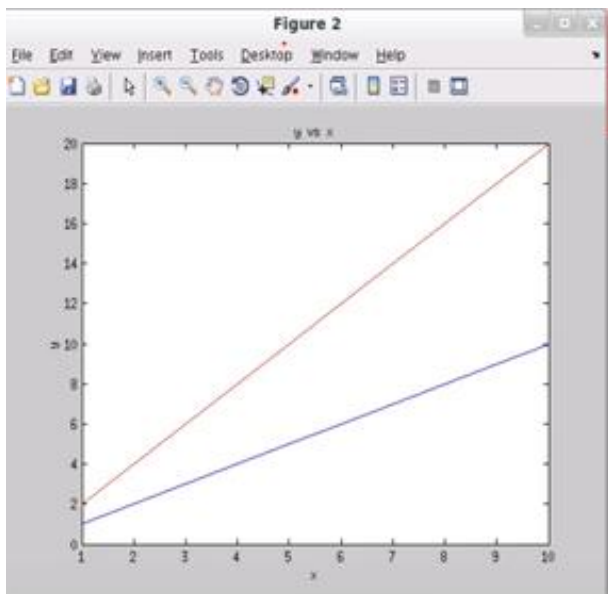


Fig. 13. Comparison of DWT and DCT

The algorithms used in this proposed work are DWT for the human face, SURF for the object recognition, and OCR for the text recognition, due to this performance of the algorithm is so fast. This technology provides the accuracy of object recognition is good. The output will have performed into an audio stream.

## V. CONCLUSION

Visually Impaired people are one of the most daring individuals on the planet as they confront a part of difficulties to contend in this world. The life of obscurity has influenced them to the propensity to feel. DWT, SURF, and OCR are the machine learning algorithms and assume critical part to extract pictures and refresh of data. MATLAB connected in

edit dataset has brought about a novel approach which has criticalness accomplishment in the perceived picture. In any case, the primary disadvantage of the existing this algorithm it doesn't recognize which type of object whether its name or object (i.e name of object or person) and the optimization of the algorithm is high that takes time to predict when compared to DWT algorithm the optimization of the algorithm is less. It takes less time to predict and identify the whether the person is well known or not. This system makes helpful for the blind people. So that they can achieve their area of interest and survive like normal people.

Furthermore, it trusts that the fruitful consummation of this framework will be of extraordinary us to those in require. The future scope of this project is vast as it may be used in real time applications in different fields of life by the visually impaired across the world for the betterment of their life. Platform independence of this system is the future work planned for this system where almost all E-gadgets, transportation (Metro Trains) will utilize this system in it through which digital support is guaranteed to all those in need of this system. This system will helpful for the blind people to come out of their darkness with the help of technology they can achieve their own field of interest.

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