A SURVEY ON SMART GLASS FOR BLIND

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# ***Abstract*—: Blindness and vision impairment make it difficult for sufferers to move around on their own and deal with problems in their daily life. Artificial intelligence and computer vision techniques help blind and visually impaired (BVI) persons carry out their core tasks without being overly reliant on others as a solution. Potential assistive technology for BVI citizens includes smart glasses, which can improve social comfort and safety while assisting with independent travel. Practically speaking, the BVI cannot move by themselves, especially at night and in dimly lit areas.In this researchWe demonstrate an object identification, facial expression recognition, and obstacle detection system for blind persons using a smart glass-like device that uses headphones as speakers to communicate object information.. Our study uses the SORDI dataset and a CNN model to detect items using computer vision. It uses a deep learning approach to recognise faces. EAST and EASYOCR models are used to recognise text. We employ an NLP data set for the detection of all regional languages. The glasses come with an ultrasonic sensor that measures the necessary space between users and objects and plays a voice note as a warning. turning on the night vision feature.Using databases to count money.Bluetooth can identify and explain human emotions to blind people.Also identifying and preserving the details of someone they recently met using AI..**

***Keywords—smartglass;IRcamera;NLP;audio receiver;CNNalgorihm;ArtificialIntelligence***

I.INTRODUCTION

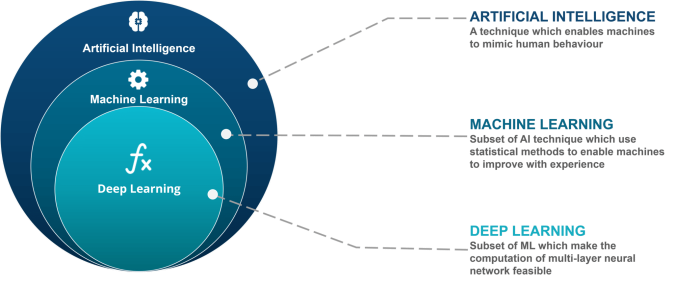
**At least 2.2 billion people worldwide are visually impaired or blind, according to the World Health Organization (WHO), and reports from previous years show that these numbers are rising. The most vulnerable people, such as the elderly, those with disabilities, ethnic minorities, indigenous populations, and those on low incomes, are the most affected by these statistics.**

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**Since sight is the only sense that allows us to see and understand more of our environment than any other, the human eye is the organ that grants sight to humans. There are currently 285 million visually impaired people in the globe, of which 246 have restricted vision and 39 million are blind. A little more than 80% of visually impaired people must work in order to support themselves, with the remaining individuals being old or retired. Systems now have a thorough understanding of the subject of image and video processing thanks to computer vision. Individuals who are partially blind or partially sighted can use the Smart Glasses to recognise and comprehend the office equipment around them. In order to walk safely, blind persons frequently utilise a cane or a dog with extensive training. The current blind cane has the drawback that it cannot adapt fast to any altering circumstance. The cost of managing guiding dogs exists. In this study, we suggest smart glasses with an IR camera and deep learning to get over these drawbacks.**

**1.1.ARTIFICIAL INTELLIGENCE**

**The idea of building intelligent machines is known as artificial intelligence. A subset of artificial intelligence called machine learning facilitates the development of AI-driven applications. Deep Learning is a branch of machine learning that trains a model using enormous amounts of data and sophisticated algorithms. The replication of human intelligence functions by machines, particularly computer systems, is known as artificial intelligence. Expert systems, natural language processing, speech recognition, and machine vision are some examples of specific AI applications. Large volumes of labelled training data are ingested by AI systems, which then examine the data for correlations and patterns before employing these patterns to forecast future states.**



# II.PROBLEM STATEMENT

**People who are blind or visually impaired confront various difficulties in daily life, including obstacles related to low vision that prevent them from fully integrating into society. They are dealing with issues like For a blind person, especially one who has completely lost their eyesight, getting around is the hardest obstacle. We are introducing the smart glass device for the blind to handle these types of situations in order to overcome such challenges.**

## III.A SURVEY ON SMART GLASS FOR BLIND

**The primary goals of the Smart Glasses assistant are to promote a significant problem in computer vision, such as the routine recognition of objects from the habit of enclosing items by blind people. The blind person's jacket-mounted camera is a large-scale object recognition and segmentation system. A collection of objects gathered from common scenarios is built in order to apply the required recognition. Locating objects in commonplace scenes is done with the use of object recognition. The camera can read out text to the blind and recognise faces. The system also has face recognition capabilities, allowing it to identify adjacent faces of persons with whom it has previously been taught. The text in printed papers can be recognised by the system and read out to the user.** **To help the blind avoid impediments, the system will read out an object's distance.**

1. A smart glass system for venture capitalists that uses computer vision and deep learning for text recognition, salient object extraction, and object detection. This fully autonomous system is powered by a server with artificial intelligence. It assists BVI in a nighttime environment by identifying and detecting objects in photos of low light and dark scenes. Deep learning models were used to expand the capabilities of the original smart glass system, and text recognition for text-to-speech was also added.
2. The most effective and well-suited guiding instructions include a beeping sound, which aids users in moving more swiftly and safely. The computation is quick enough to allow for obstacle detection and presentation. The proposed smart guiding glasses can improve the travelling experience for those who are blind or visually challenged, according to experimental results of the proposed prototype. It is extensively useable in the consumer market thanks to the use of simple and inexpensive sensors.
3. Beeping sounds are among the most useful and appropriate guiding instructions because they help users move more quickly and safely. The computation is quick enough to support the presentation and detection of obstacles. According on testing findings of the proposed prototype, the suggested smart guiding glasses can enhance the travelling experience for those who are blind or visually impaired. Because it uses basic and affordable sensors, it may be used widely in the consumer market.
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5. The design uses object, face, and text recognition to provide VC users with a visual. An eyeglass with a built-in camera, headphones, and a microphone are included in the smart kit. The database of the system contains written descriptions for each image, which when spoken convert to audio streams.
6. The blind individuals must rely solely on lead sticks to guide them because they are unable to accurately identify the difficulties they meet. The user would have a lot more thorough understanding of the process thanks to the smart glass's processor, which is equipped to process the photos that are collected and detect things to educate the user about the outcomes of the image. Additionally, it can reveal what the challenge is. This smart glass can detect how close an obstruction is and provide a warning to let the user know. This application was created to give the user such a speech-based interface.
7. The system suggests smart eyewear with stereo cameras and deep learning. A stereo camera measures the space between the user and the obstruction and then notifies them via sound and vibration. To identify the sort of obstacle facing the user, we employ YOLO, one of the deep learning algorithms. The results of the experiments show that the suggested smart glasses outperform the current blind guide system.
8. The replication of human intelligence functions by machines, particularly computer systems, is known as artificial intelligence. Expert systems, natural language processing, speech recognition, and machine vision are some examples of specific AI applications. Large volumes of labelled training data are ingested by AI systems, which then examine the data for correlations and patterns before employing these patterns to forecast future states.
9. The idea of building intelligent machines is known as artificial intelligence. A subset of artificial intelligence called machine learning facilitates the development of AI-driven applications. Deep Learning is a branch of machine learning that trains a model using enormous amounts of data and sophisticated algorithms.

[10] Artificial intelligence is the concept of creating intelligent machines. The creation of AI-driven apps is made easier by a branch of artificial intelligence known as machine learning. Machine learning's deep learning subfield uses complex algorithms and vast volumes of data to train models.

IV.IMPLEMENTATION

* 1. **A typical and highly effective concept is that when an object or barrier is detected in front of them, an immediate alert signal is sent through voice note**
  2. **Human or friend recognition using a small camera that, when a person passes in front of it, recognises them and provides a spoken message with their saved name.**
  3. **Turning on the night vision feature**
  4. **Using Look tell money reader databases to count money.**
  5. **Text-to-speech conversion not only in english but also in our local language**
  6. **Identifying and preserving the details of someone they recently met.**
  7. **Taking a photograph with the built-in camera by double tapping the sensor area, and then explaining the image to the user what was captured.**
  8. **Accordingly, traffic signs and signals are seen and explained to them.**
  9. **The audio receiver receives audio and uses nvia broadcast to identify undesired noises. It then concentrates exclusively on the primary speaker and separates the voices based on slang, which allows it to provide information about friends, strangers, or undesirable persons.**

# **V.**METHODOLOGY

For the development of the project,we are using a

artificial intelligence using deep learning.

**CNN akgorithm:**

**Using a convolutional neural network The way CNN operates is to obtain an image, assign it a weight depending on the various items in the image, and then separate them from one another. In comparison to other deep learning algorithms, CNN requires extremely little pre-processing of the data. Convolutional Neural Networks, also known as CNNs, are a subset of artificial neural networks used in deep learning and are frequently employed for object and picture recognition and categorization.**

**IR camera:**

**IR cameras on laptops are often used to detect the facial features of a person. These cameras work in tandem with a regular webcam to detect the user’s face in photos**

**VI.DATASETS:**

**NLP- Natural language processing refers to the branch of computer science—and more specifically, the branch of artificial intelligence or AI— concerned with giving computers the ability to understand text and spoken words in much the same way human beings can.(containing all regional languages)**

**SORDI-synthetic object regognition data set is a synthesised data set containing 80 object classes, and over 800,000 photorealistic images and their modalities. SORDI.ai is designed to suit general image processing tasks including classification, object detection or segmentation.*.***

**EAST AND EASYOCR-It contains datasets to**

**recognize a text**

BLOCK DIAGRAM FOR TEXT

RECOGNIZATION

Automatic speech

recognition

Natural language

processing

Text to speech

## VII.CONCLUSION

**This study describes a smart eyewear system for BVI people that uses computer vision and deep learning for text recognition, object identification, and salient object extraction. The suggested system utilises an AI server and is entirely automatic. It aids BVI in a nighttime environment by identifying items from low-light and darkscene photos. Deep learning models were used to expand the capabilities of the existing smart glass system, and salient object extraction for tactile graphics and text recognition for text-to-speech were added.**

VIII.REFERRENCE

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