

APPLICATIONS

- The technology can be used in self-driving cars to detect other cars on the road, identify pedestrians and read road signs.
- The technology can also be useful in surveillance procedures to monitor some individuals and their activities as well.

FUTURE PROSPECTS

- The number of classes of objects or known faces can be increased by using more data.
- The ability to recognize languages other than English can be added as well.
- The accuracies can be increased by using a larger dataset comprising of more data.
- The speed can be increased by using a more powerful microcontroller or computer.

SUMMARY

The purpose of the project is to help the people with visual disabilities to recognize everyday objects, faces and textual information in their line of sight to make them more independent in their daily chores. The solution is cheap, compact and wearable with no side effects.

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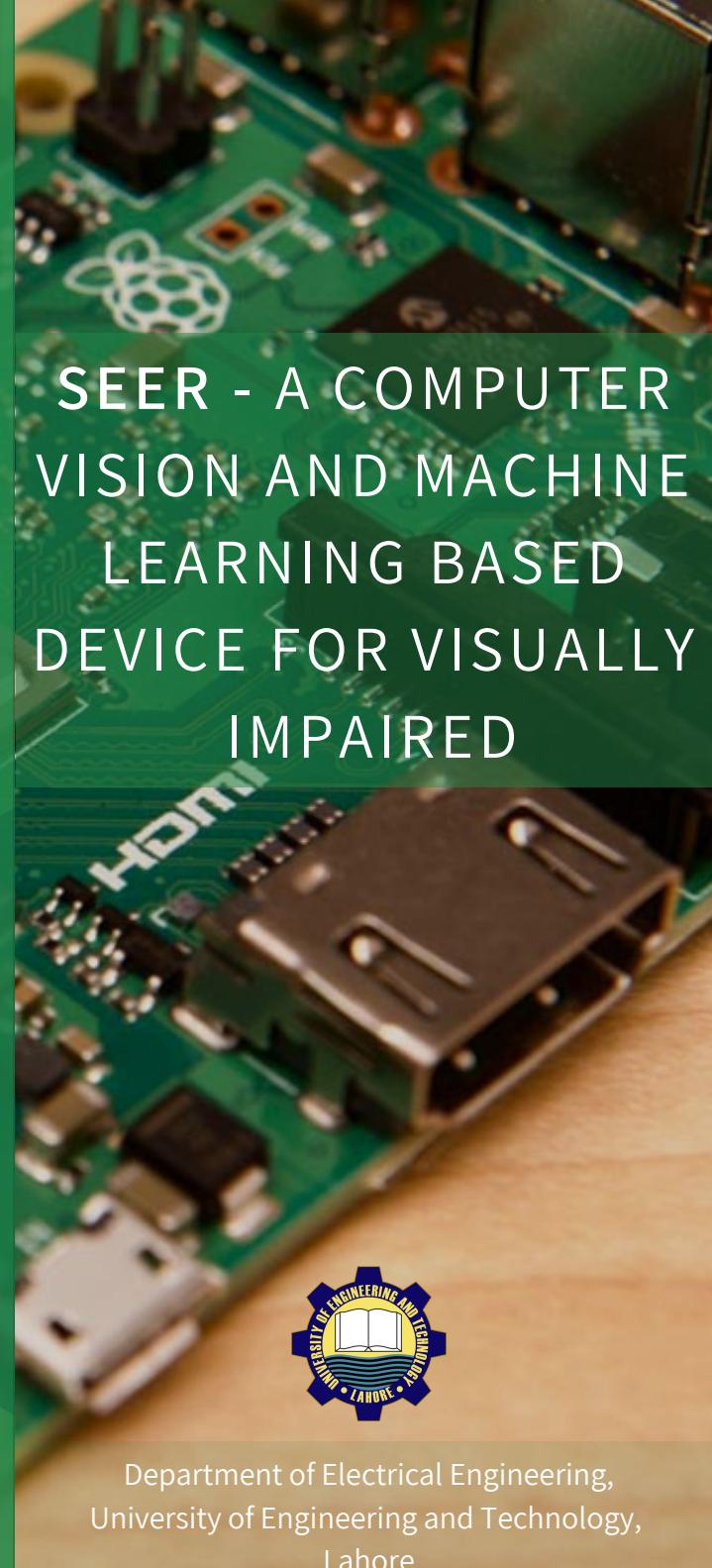
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SEER - A COMPUTER VISION AND MACHINE LEARNING BASED DEVICE FOR VISUALLY IMPAIRED



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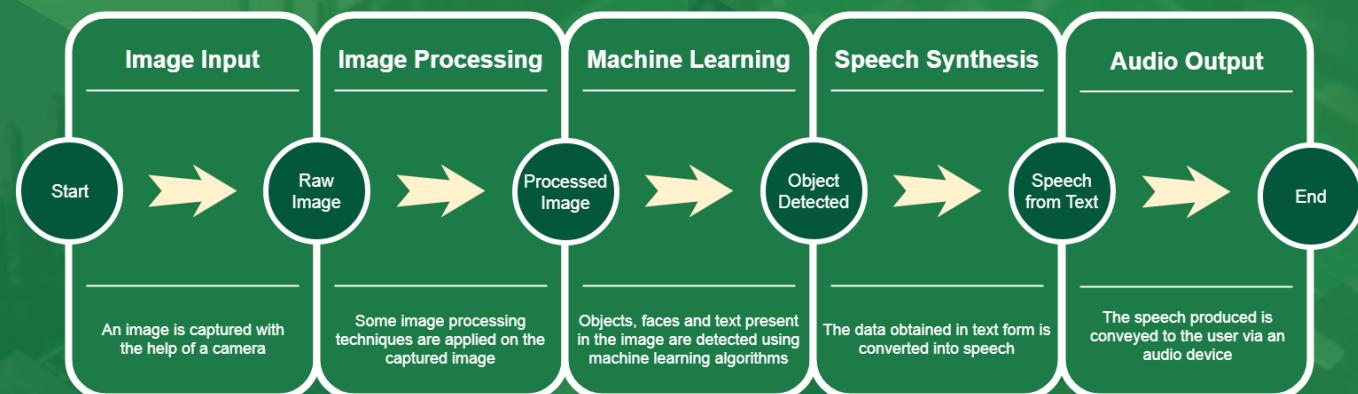
ABSTRACT

The project is aimed at aiding the visually impaired people in their everyday routine. The project deploys computer vision and machine learning algorithms retrained over our own custom dataset to identify objects, faces and text encountered by the user. The output is conveyed to the user in the form of audio. Major tools utilized in the project are Python, Colab, OpenCV, Tensorflow and ImUtils.

OBJECTIVES

- Identifying the various common objects, familiar faces and readable text which are encountered by the user in their daily life.
- Conveying the obtained information about detection to the user in the form of audio.
- Achieving substantial accuracy for object, facial and text detection and recognition.
- Providing a low cost and effective solution to the problem of visual impairment.

METHODOLOGY



RESULTS

- The results show promising accuracies and substantial speeds for all three domains.
- The accuracy achieved for object detection and recognition using MobileNet SSD model on custom dataset comprising of 30 objects with 50 images per category is around 80%.
- The accuracy achieved for facial detection and recognition using a combination of HAAR and HOG algorithms on custom dataset comprising of 10 persons with 50 images per person is around 85%.
- The accuracy achieved for text detection and recognition using a combination of EAST and Tesseract models pre-trained on dataset for English language is around 90%.

GRAPH

