**A**

**Synopsis**

**On**

**Project Based Seminar**

**Title: -**. Glasses Connected to Google Vision that Inform

Blind People about what is in Front of Them

**Submitted to**

**Department of Information Technology**

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# SYNOPSIS

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**Branch:- Information Technology**

**Seminar Title: -** **Glasses Connected to Google Vision that Inform**

**Blind People about what is in Front of Them**

**Domain Name: - Google Cloud Vision**

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**ABSTRACT**

More than a billion people around the world have vision problems for different reasons, and these numbers are increasing every year. This leads us to make different innovations in the field of computer vision, with the aim of providing a better quality of life for these people. In this document we present as a resource, the development of an intelligent lens, which incorporates a Raspberry Pi ZW connected to the Google Cloud Vision API through the Wifi of the user's mobile phone, where at the touch of a button, the Raspberry camera, captures the image, processes it in a few seconds and retrieves its main features, obtaining important information for mobilization such as: pedestrian crossings, bus stop sign, vehicles, green light, etc. 150 people from the National Union of the Blind of Peru (NUBP) were evaluated with different degrees of blindness, obtaining a 40.5% increase of independence for their mobilization.

**Technical Keywords**

Google Cloud Vision, Text detection. Recognition, Assistive Technology, API, OCR, Smart Glasses, IoT

**Motivation**

* To help blind people for overcoming their disability for some extent
* Reduce the size of the technology that already exists
* High accuracy based on classification technique.

**Objectives**

* To convert text from image
* To help blind people for overcoming their disability for some extent
* Proposed system is portable and can be used as glasses

**Algorithms**

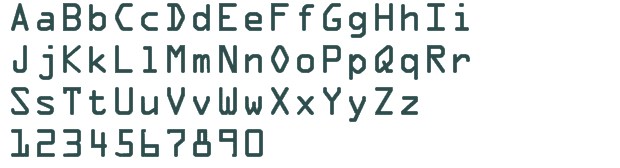
**Optical Character Recognition algorithm :**

****‘Optical Character Recognition’ – or OCR – is a process which allows us to convert text contained in images into editable documents. OCR can [extract text from a scanned document](https://www.scan2cad.com/cad/ocr-text-technical-drawings/) or an image of a document; really, any image with text in it.

This technology is employed for a variety of applications, such as data entry of documents, automatic number plate recognition, digitisation of printed documents in Google Books, and even [beating CAPTCHA anti-bot systems!](https://www.theverge.com/2014/4/16/5621538/google-algorithm-can-solve-recaptcha-almost-every-time)

There are two different techniques (or algorithms) in optical character recognition: pattern recognition and feature extraction, and each technique is worth looking at in a little bit more detail.

## Pattern recognition :



Using this technique, the computer tries to recognize the entire character and matches it to the matrix of characters stored in the software. As a result, this technique is also known as pattern matching or matrix matching. The drawback of this technique is that it relies on the input characters and the stored characters being of the same font and same scale. Check out the photo on the left — it’s the first font created in the 1960s for OCR — the OCR-A — where every letter had the same width. All cheques were printed using this font to allow banking computers to process them!

## Feature extraction :

This one is a much more sophisticated way of spotting characters. It decomposes characters into “features” like lines, closed loops, line directions and intersections. Let’s take letter A as an example. If the computer sees two angled lines that meet at the top, and both lines are joined together by a horizontal line in the middle, that’s a letter A.

By using rules like these, the program can identify most capital ‘A’s, regardless of the font that it is written in.

**Pre-processing to improve text recognition :**

In order to recognize text effectively, the software must pre-process the image using techniques such as:

* De-skew – Titlting the image a few degrees in order to make the lines of text perfectly horizontal or vertical
* Despeckle – Removing spots and smoothing the edges of the characters
* Character isolation – Split touching characters that may have bled into each other
* Layout analysis – Identifying text positions, columns and paragraphs
* Line removal – Removing overlying lines or boxes

More sophisticated software conducts post-processing steps as well. The software would match the transcribed output to a lexicon (a dictionary of allowed characters), or conduct near-neighbor analysis to identify words that are usually seen together (for example, the phrase “living doom” will be automatically corrected to “living room”, since the word “living” and “room” often occur together).

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**Guide Name**

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