# BARCODE DETECTION IN IMAGES AND VIDEO STREAMING

**NIRUPAMA PALAPALLI[1], K.LEELA MANASA[2], K.ANISHA[3],K.RAM VINAYAK[4]**

*LENDI INSTITUTE OF ENGINEERING AND TECHNOLOGY, JONNADA ,VIZAINAGARAM.*

---

**Abstract -** In today's environment, all goods and objects that remain on the market have a special identifier or ID connected with them. This unique Identification is what we consider a barcode. A barcode is a machine-readable optical sticker that provides details regarding the object to which it is connected. Barcode Detection is really popular and is a necessity today because it makes our job simpler. one can check the code and quickly get all the specifics of the drug. It's growing more common and more widespread every day. This analysis addresses the real time barcode detector in photos and video sharing using python and OpenCV. The barcode recognition method makes for a deeper and faster comprehension of the label. This is the most sophisticated form of barcode detection method that is being examined. With the introduction of technology, there may be multiple devices involving the use of barcodes. Barcode may be used to monitor machinery and hold simple records, including history, to help control the quality and quantity of goods.

***Key Words***: Barcode detection, Python, OpenCV, Computer Vision**.**

## 1. INTRODUCTION

Barcodes are used for the automated recognition of objects or for the exchanging of messages. Details, such as products suppliers, distributors, product names, manufacturing times, mailing address and location, can be encoded in barcodes. Barcode techniques have been commonly employed for many decades and have been extended to inventory protection, paper processing, medical services, packaging, delivery of products, manufacturing and distribution, and warehousing. The barcode is assembled according to a series of guidelines to provide details for computer interpretation. The compilation of laws is referred to as the symbology. If a barcode reader has to interpret a number of symbologies, it is inefficient to decipher the aim symbol by checking out all the symbologies assisted by the user. One potential change is the recognition of the symbol used for the targeted symbol. So the user will use the right symbology to decipher the sign. If the computational complexity of the Identification Module is less than that of the Decoding Module, Identification will increase the reader's performance.The barcode identification method consists of two stages, diversified barcode detection and barcode decoding. Barcode detection acts as a so-called image preprocessing tool to significantly reduce the computing difficulty of the corresponding barcode decoding element. Barcodes (1D or 2D) are constructed from normal (dotted) lines of different thicknesses and spaces that can hardly withstand stains, abrasive damage, irregular light, messy history, etc. The complexity of scenes makes barcode identification challenging for conventional image processing algorithms, particularly when coping with scenes with several randomly positioned and rotated contaminated barcodes

### 1.1 RELATED WORKS

Barcode identification proved to be a big problem in the 21st century, leading to a significant amount of casualties for drug owners. Currently, barcode details can only be interpreted through the barcode scanner. No other tool or system capable of reading barcode is therefore introduced as an alternative approach for reading barcode; utilizing image processing. The image processing module consists of an image pre-processing module that translates a camera-captured picture or other picture from a monitor or archive to a pre-processed grayscale image, eliminates noise in a pre-processed image, and raises the contrast between bars and spaces in a pre-processed image. It is also impossible for consumers who are involved in the barcode program to consider the easiest way to know about barcode because of the high-priced barcode scanner. That is attributable to the high selling price of an automated scanner.

### 1.2 OUR APPROACH

Barcode recognition algorithms that use various methods to evaluate the position of the barcode in the picture and video. Barcodes may be set or variable in duration. For fixed length codes, the norm defines how many characters are contained in the document, while the other form can encode an undefined number of characters. Various common application styles have different features that help to localize them. Barcode localization approaches have two conflicting objectives: precision and speed of detection. Accuracy is critical for the manufacturing world because undetected (missed) codes will contribute to a loss

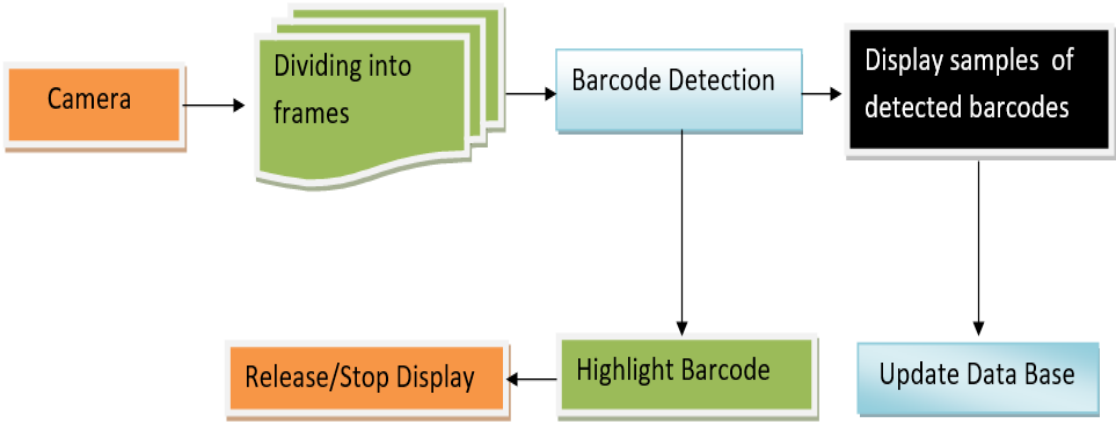
of income. Reading speed is the secondary properties of the detectors.Accuracy is not so important on smartphones, since the app connects with the consumer and is simple to access, however fast (and relatively accurate) barcode recognition is beneficial.Different methods are used to identify and decipher barcodes from photographs:from traditional line scanning methods to extensively explored morphological strategies and modern research utilizing wavelets. The new framework is visual barcode recognition and video sharing for stock control. It is used to illuminate the barcode of the known image or video clip. This allows the customer to quickly locate the specifics of the drug. This is a more effective and sophisticated analysis tool.

## 2. WORKING

Initially, an image file or video file is recognised. The device should be able to interpret barcode from an image / video which can be recorded by a webcam. The program analyzes the image / video and shows the barcode form, details and picture size on the Graphical User Interface (GUI). System name is used to distinguish various barcode styles and show the data until the barcode image / video is collected.

System design is a computational model that describes the configuration, actions and views of the device. Definition of the architecture is a systematic definition and depiction of the system.

**Fig:** System Architecture of Barcode Detection in Images and Video Streaming.




### 2.1 METHODOLOGY

Step-1: Start the code execution through command prompt

Step-2: Import the respective modules like computer vision2, numpy,imutils,argparse.

Step-3: we use the Scharr operator (specified using ksize=-1) to construct the gradient magnitude representation of the grayscale image in the horizontal and vertical directions .

Step-4: we subtract the *y*-gradient of the Scharr operator from the *x*-gradient of the Scharr operator . By performing this subtraction we are left with regions of the image that have high horizontal gradients and low vertical gradients.

Step-5: The first thing we'll do is apply an average blur to the gradient image using a *9 x 9* kernel. Any pixel in the gradient image that is not greater than 225 is set to 0 (black). Otherwise, the pixel is set to 255 (white).

Step-6: start by constructing a rectangular kernel using cv2.getStructuringElement . This kernel has a width that is larger than the height, thus allowing us to close the gaps between vertical stripes of the barcode.

Step-7: we simply find the largest contour in the image, which if we have done our image processing steps correctly, should correspond to the barcode region. cnts=cv2.findContours(closed.copy(),cv2.retr_external,cv2.chain_approx_simple).

Step-8: We then determine the minimum bounding box for the largest contour.

cv2.drawContours(image, [box], -1, (0, 255, 0), 3)

Step-9: now it successfully detected the barcode.

Step-10: exit from the code

## 2.3 PROJECT IMPLEMENTATION

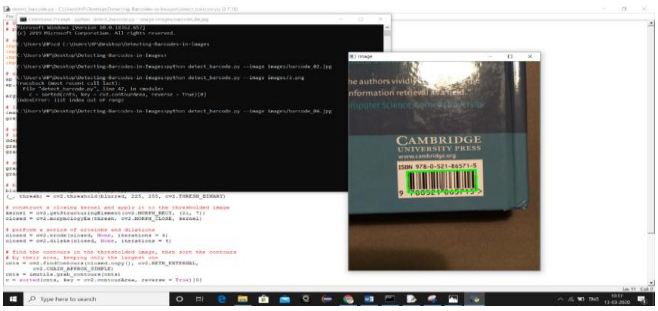
OpenCV (Open Source Computer Vision Database) is an open-source computer vision and machine learning applications platform. OpenCV was developed to include a shared platform for computer vision applications and to promote the usage of machine perception in consumer goods. It has a number of advanced algorithms that can quickly be used to execute our tasks. This paper focuses on studying Python for the purpose of mathematical calculations. . We presume that the reader has any understanding of simple mathematics, however we tend not to infer some previous exposure to computer technology, although any of that experience will definitely be useful. Python is a popular option for mathematical calculations, because we can rapidly compose code, check it easily, and its syntax is close to the way mathematical concepts are presented in mathematical literature. By learning Python, you can also know a main resource utilized by several web developers.

## 2.4 EXPERIMENTAL RESULTS

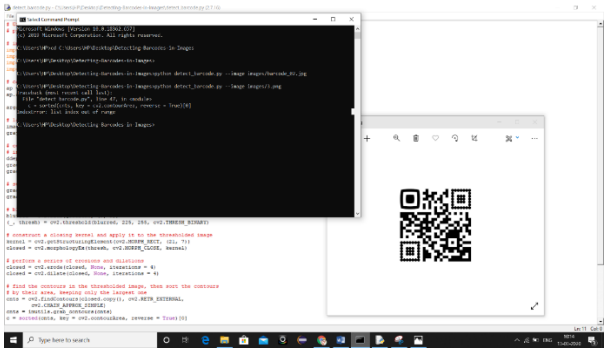
| TestcaseNo. | Test Condition | Output |
|---|---|---|
| 1 | Detection of barcode | SUCCESS |
| 2 | Test Case when barcode is undetected | ERROR IN BARCODE DETECTION |

**Fig: Representation of Test cases and status**

TEST CASE-1:



TEST CASE-2



## 3. CONCLUSION

This research discusses the incredible value of image processing. In order to solve much of the world's problems human understanding of the world through vision, sufficient, low-cost techniques are possible to modify images and enable robots and communicate with their surroundings through vision.The proliferation of wearable sensors in our lives is through the need for identification and acknowledgement of non-framed photographs in the wild. It is valid, of course, in print, which is much more challenging to read in a shop window in the street than in a book in a flatbed scanner. The same is true in barcodes.In the end, the goal of several computer vision research projects is to remove textual labeling from pictures.The lack of labeled training data is a frequent complaint in this area.The good news is that we regularly see a lot of barcodes that express this semantic mark in our everyday lives. Through being able to read these unintended barcodes and connect them with monitored objects in video frames, we would be able to do this.

## REFERENCES

[1] P. Bodnar and L. Nyul. Improving barcode detection with combination of simple detectors. In Signal Image Technology and Internet Based Systems(SITIS),pages300–306,Nov 2012.

[2] T. Pajdla. Barcode detection with uniform partitioning and distance transformation. In IASTED International Conference on Computer Graphics and Imaging, pages 48–53, Feb 2013.

[3] M.Kamel. A novel method for barcode localization in image domain.

[4] Syue-Cin Lin, editors, Image Analysis and Recognition, volume 7950 of Lecture Notes in Computer Science, pages 189–196. Springer Berlin Heidelberg, 2013.

[5] Guangtao Zhai†, and Zhiyong Gao. Barcode localization using a bottom hat filter, 2005.

[6] Puchong Subpratatsavee, Narongrit Janthong. A novel method for accurate and efficient barcode detection with morphological operations. In Signal Image Technology and Internet Based Systems (SITIS), pages 307–314, Nov 2012.

[7] M.KatonaandL.Nyl. Efficient 1d and 2d barcode detection using mathematica l morphology. In Mathematical Morphology and Its Applications to Signal and Image Processing, volume 7883 of Lecture Notes in Computer Science, pages 464–475. Springer Berlin Heidelberg, 2013.

[8] J. Matas, O. Chum, U. Martin. Robust wide baseline stereo from maximally stable extremal regions. In Proc. of the British Machine Vision Conference, pages 384– 393, 2002.

[9] Narrative. Narrative clip, 2014. https://getnarrative.com/.

[10] X. Ren and C. Gu. Figure-ground segmentation improves handled object recognition in egocentric video. In Computer Vision and Pattern Recognition ssss(CVPR), 2010 IEEE Conference on, pages 3137–3144, June 2010.

[11] S. Wachenfeld, S. Terlunen, and X. Jiang. Robust recognition of 1-d barcodes using camera phones. In Proc. of 19thInternationalConferenceonPatternRecognition(ICPR 2008), pages 1–4, 2008.

[12] A. Zamberletti, I. Gallo, and S. Albertini. Robust angle invariant 1d barcode detection. In Pattern Recognition (ACPR), 2013 2nd IAPR Asian Conference on, pages 160– 164, Nov 2013.

[13] J. Dai, Y. Li, K. He, and J. Sun, "R-fcn: Object detection via regionbased fully convolutional networks," in Advances in neural information processing systems, 2016, pp. 379–387. 3 .

[14] J.Dai,H.Qi,Y.Xiong,Y.Li,G.Zhang,H.Hu,andY.Wei,"Deformable convolutional networks," CoRR, abs/1703.06211, vol. 1, no. 2, p. 3, 2017. 3.

[15] T. Kong, A. Yao, Y. Chen, and F. Sun, "Hypernet: Towards accurate region proposal generation and joint object detection," in Proceedings of the IEEE conference on computer vision and pattern recognition, 2016.

[16] X. Zhou, C. Yao, H. Wen, Y. Wang, S. Zhou, W. He, and J. Liang, "East: An efficient and accurate scene text detector," 2017.

[17] Jia, Yangqing, Shelhamer, Evan, Donahue, Jeff, Karayev, Sergey, Long, and Jonathan, "Caffe: Convolutional architecture for fast feature embedding," pp. 675–678, 2014. 3

[18] A. Zamberletti, I. Gallo, and S. Albertini, "Robust angle invariant 1d barcode detection," in Pattern Recognition, 2014, pp. 160–164. 3, 4

[19] S. Wachenfeld, S. Terlunen, and X. Jiang, "Robust recognition of 1-d barcodes using camera phones," in International Conference on Pattern Recognition, 2008, pp. 1–4. 3

[20] G. S¨or¨os and C. Fl¨orkemeier, "Blur-resistant joint 1d and 2d barcode localization for smartphones," in Proceedings of the 12th International Conference on Mobile and Ubiquitous Multimedia. ACM, 2013, p. 11. 4.