Project Proposal

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1 Project Overview

This project focuses on developing an automated system for detecting multiple barcodes from an image using image processing techniques. Images will be taken using mobile camera sensor. It will detect 1D barcodes such as EAN-13 barcodes, Code-128 barcodes, 2D barcodes such as QR codes. Moreover, it will be angle invariant, requires less user interaction.

2 Implementation

The implementation involves creating an algorithm that can detect and decode both 1D and 2D barcodes. Implementation will be done in Python and will include Preprocessing, Barcode Detection , Barcode Displaying and then Decoding.

3 Dataset

The datasets we will be using product images with various shapes and barcodes, as well as the ArTe Lab dataset, which provides a range of images with different resolutions for testing barcode detection accuracy. These datasets feature a mix of common barcode types used in retail and inventory settings.

4 Problem Solved

This project addresses the inefficiencies in traditional barcode scanning systems, where each barcode must be scanned individually. By enabling simultaneous detection of multiple barcodes, the system reduces time spent during checkout processes and minimizes the need for costly barcode scanners.

5 Challenges and Future Scope

Challenges include handling low-resolution images, dealing with complex or reflective backgrounds, and ensuring accuracy with angle-invariant barcodes.

Future work could involve integrating machine learning for improved barcode localization and expanding the system to recognize a wider variety of barcode types. In future scope this could used by business systems, specifically targeting applications like supermarket billing systems and inventory management.

References

[1] K. V. Gowtham M N, "Generating EAN-13 Standard Barcodes," *International Journal of Science and Research (IJSR)*, vol no. 3, no. 6, pp. 1307-1309, 2014.

[2] K.-T. W., M.-C. W., N.-Y. C., J.-H. W., Chun-Shun Tseng, "Retrospective Tracking for Barcode Reading," *IEEE*, pp. 114-119, 2010.