QR Based Label Connected to an API

Problem

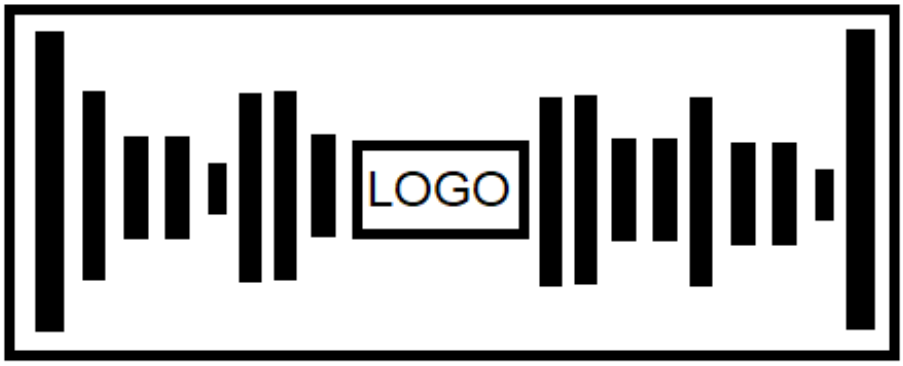
QR codes are widely used in the industry but they tend to be almost impossible to personalize. The personalization of scannable labels is particularly implemented by companies that try to reach more customers with innovative ways to connect products with audiences.
We present our own solution that will allow the user to interact with an API by creating a unique scannable barcode label.

Approach

Using Python and various Python libraries including NumPy and OpenCV, we will build our program. The goal is to build a proof of concept program using built-in OpenCV libraries, including their built-in shape detection framework. After developing a working proof of concept with the built in functionalities, we then plan to implement the shape detection and various other detectors on our own. Using an agile framework, we plan to build a simple working program and build off on it, giving it more features like adding the option for video detection.

Some features of note to be added:

- Simple box detector with aspect ratio check to confirm it is correct
- Line length detector based on ratio of line length to box height
- Video capabilities
- Connection to a custom API for custom QR code calls



Example of a custom QR-code

Expected Outcomes

This implementation should transfer enough data to allow interaction between the user and the API. The program should be capable of properly detecting and decoding the label within a reasonable distance from the camera. Our implementation also should be able to ignore any object that does not satisfy the conditions that define our label.

References

- How does Spotify Codes Work? link
- Image Processing in OpenCV link
- OpenCV Shape Detection link