Object Detection Using Computer Vision

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INTRODUCTION

Object Detection is used in an abundance of areas such as surveillance, modeling, or even video game design In this project, methods of object detection were researched These methods would later be applied to gesture creation. One of the most important tools for object detection is the OpenCV library. This is an open-source computer vision library with real-time functions and algorithms designed for real-time applications The research for this project includes learning about the applications of OpenCV and how to integrate it into applications for object detection.

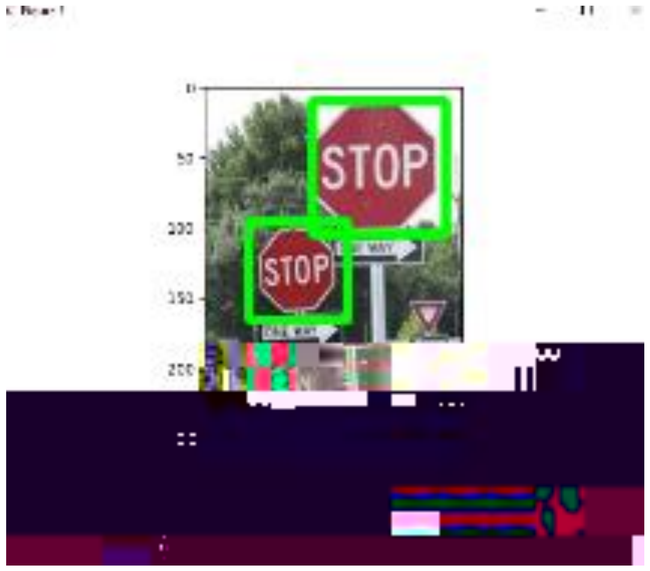
‡ Learn code written to construct a custom gesture

‡ Learn how to detect a single object in an image

‡ Learn how to detect multiple objects in an image

METHODS

‡ Recreate Gesture functions with Unity and Visual Studio
‡ Develop Haar Cascades
  o Use built in OpenCV functions
  o Use third party software
‡ Use an API for image classification and Object Detection
‡ Use Python and C# for communication with the API and for testing Haar Cascade files

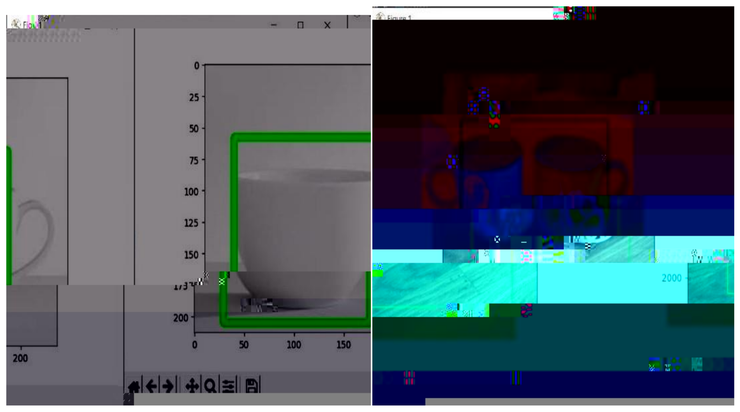


RESULTS

‡ Figure 2 is an example of using an existing Haar Cascade Classifier for Stop Signs Haar Cascade Classifiers can detect multiple of the same object within an image

‡ A custom Haar Cascade Classifier was created for the detection of coffee mugs The accuracy of the Classifier is shown in Figure 3 when this classifier is used to detect a single and multiple coffee mug object within an image

have



been explored. Haar Cascades Classifiers are good for detection of multiple of the same object but not useful for multi object detection. Researching on how to detect multiple different objects, and API was selected as the main method. This is accurate but leaves little room to change how training is done for better customization of the network.

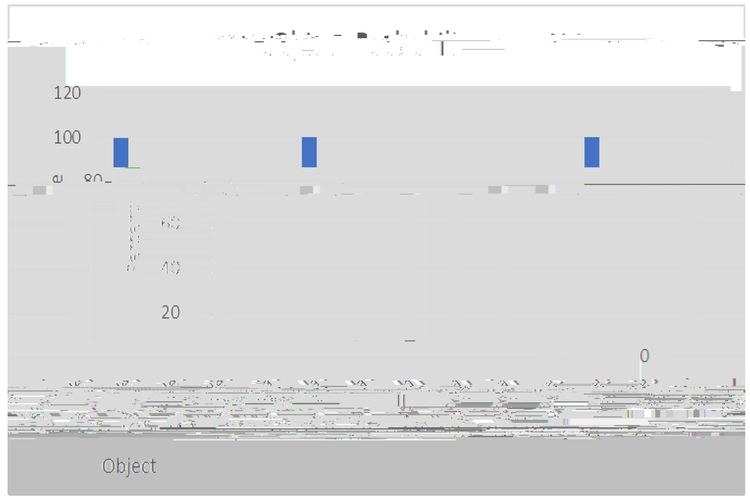


Figure 4. Multiple Object Detection, Results from API

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-object-wBBC q 0 0 3456 3024 re 51 r

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make-custom-haar-cascade

Acknowledgments

This project was support by Dr. Ye Zhu