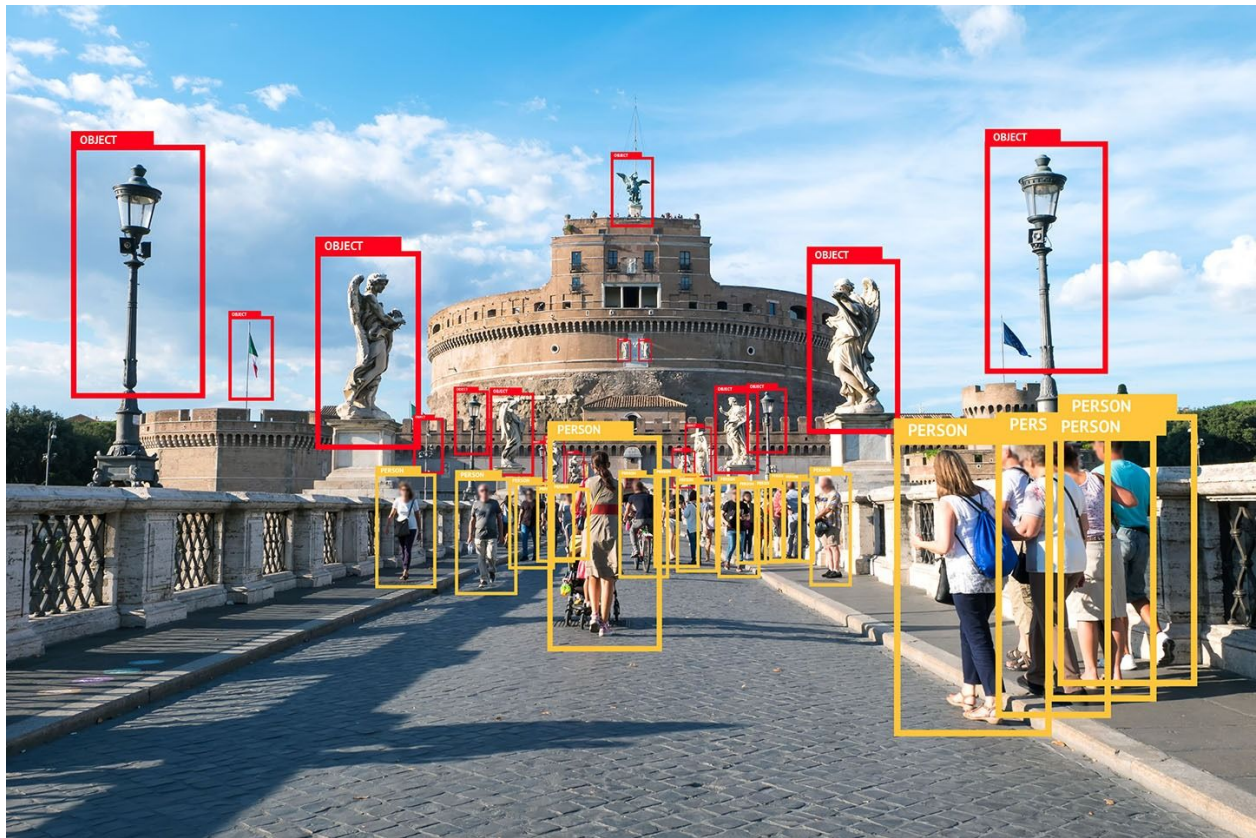


Project proposal:
OBJECT DETECTION



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Team Introduction

Our team consists of Mario, Lukman, Jeconiah, and Sunny. We are all 3rd semester sophomores of BINUS International University. We enjoy coding and are curious to explore new things that are related to Artificial Intelligence and Machine Learning. We believe that with the combination of our skills, experience, and knowledge, we will be able to create an outstanding program for this project that is beneficial and solves a real life problem.

Background

Object detection is a computer technology related to computer vision and image processing that deals with detecting instances of semantic objects in a picture or video. Object detection itself has applications in many areas of computer vision including image retrieval and video surveillance. Since this technology deals with identifying the presence of various objects in an image or video, object localization plays an important role in object detection and classification. In this project, we aim to achieve image recognition with the highest accuracy as possible. Image recognition is defined as the ability of a computer to classify an object and bound it with a box around their extent.

Problems

1. Difficulties in counting people in crowded scenes

Mass crowd gatherings such as concerts make it more difficult to count people correctly and consistently. The issue of accurately estimating the number of people in a scene has several real life applications, such as dynamic control of traffic lights to optimize pedestrian flow based on the analysis of the number of people, and then track their precise locations all while accurately labeling them, controlling the entrance of passengers in a station, environmental security, etc.

2. Surveillance system

In video based surveillance systems, the need to detect events is recurrent. The most common information to be detected are people who are entering or leaving specific areas in the scene, taking or leaving objects in the scene, crowd formation, fights, etc. The use of multiple surveillance systems becomes necessary when one wishes to detect and count multiple occluding people in a complex environment.

3. Anomaly detection

Anomaly detection is simply the mode of detecting and identifying anomalous objects in an image or a video. Anomaly detection helps people who work in the surveillance and security sector to identify possible fraud.

Solution

The concept of object detection is the ability to identify objects in a single image or series of images inside a video. To make this project more applicable in real life, we aim to have a real-time object detection program with OpenCV and Raspberry Pi. OpenCV is a library of programming functions mainly aimed at real-time computer vision. By using it, one can process images and videos to identify objects, faces, or even handwriting of a human. Meanwhile, Raspberry Pi is a series of small single-board computers that has a dedicated camera input port which allows us to record HD video and high-resolution pictures. Using Python and specific libraries written for the **Pi**, we are able to create tools that take photos and video, and analyze them in real-time or save them for later processing. On top of these, we aim to have the highest accuracy as possible in identifying and classifying the object by training the machine.

We believe that this project is the early step of various advancements that can be done in the future. Object detection will be highly useful in the future as self-driving cars and automatic surveillance system usage arises.

Motivation

We are pushing through our limits and comfort zones by challenging ourselves with this project by exposing ourselves with new libraries and technology that help us to leap forward. We believe that innovations start from a small scratch before it goes big and revolutionary.

Aim

The aim for this project is to create a program that is able to detect objects in real-time with the accuracy as high as possible.

Scope

Having a program that can be used in multiple applications. For example, using this program and expanding it for real-time detection in automatic driving cars. Other than that, send an alert to the homeowner should a robbery action occur.

Activity Plan

Week	Activity
9	Research about object detection and start coding
10	Alpha testing and debugging
11	Beta testing and debugging
12	Finalize project and create documentation
13	Final presentation & submission of project