**Graded Discussion 6**

Object detection is widely used in CV applications. None the less, object detection remains a difficult problem, with tradeoffs between speed, accuracy, and number object classes.

Think of a CV solution you might like to implement that requires object detection. What is the solution and how is object detection employed? What are the difficulties you are likely to encounter, such as occultation of one object by another, speed vs. accuracy trade-offs, large numbers of object categories, large range of scale of objects, or often most importantly maintaining human safety?

Make a post here in Piazza of about 100-300 words discussing your application idea. Then post a comment or question on another students post of about 100-200 words.  Posts are due by May. Do not post respond in Canvas.

One of the projects that I am interested in is the use of Object Detection (Computer Vision) for backyard vegetable gardening or local gardening, which I guess can be expanded to agriculture in general. The main idea would be to have a system can monitor the grow of vegetables by looking into real time images of such and providing real time feedback such as: alerts if other parasitic plants/insects are seen in the area, alerts if any disease is present on a particular plant, as well as general grow rate, in other words crop monitoring, plantation monitoring, insect detection, automatic weeding, automatic harvesting and maybe even product quality. Ideally the system would have other sensors such as humidity and temperature sensors to provide better feedback, but using an Object Detection algorithm should improve the ability of take care of such vegetable garden/crop in an easier way and even in an automated way as real time data is provided.

One of the main problems with this application, as probably is the same problem for most applications, is to get a big enough training data to be able to capture not only the presence of parasitic plants and/or insects, but also the specific category of such as well as identify not only if the vegetable plant has a disease but also what kind. This level of granularity would be challenging at the beginning, but at the advantage compared to other systems is that this could be consider a static system which means that neither the plants nor the other objects that we want to capture are changing or moving drastically from their original state/position. Another advantage is that for this particular application (small scale vegetable gardening) speed is not a big of a concern, therefore we could potentially choose the model that yields better accuracy.

**Reference:**

Object Detection in 2022: The Definitive Guide: <https://viso.ai/deep-learning/object-detection/>

87 Most Popular Computer Vision Applications in 2022: <https://viso.ai/applications/computer-vision-applications/>

Collision Avoidance System: In-Vehicle Computer Vision for Logistics: <https://viso.ai/applications/collision-avoidance-system/>

The 10 Top Applications of Computer Vision in Retail in 2022: <https://viso.ai/applications/computer-vision-in-retail/>

Review: RetinaNet — Focal Loss (Object Detection): <https://towardsdatascience.com/review-retinanet-focal-loss-object-detection-38fba6afabe4>

FarmBot (Backyard vegetable garden option): <https://farm.bot/>