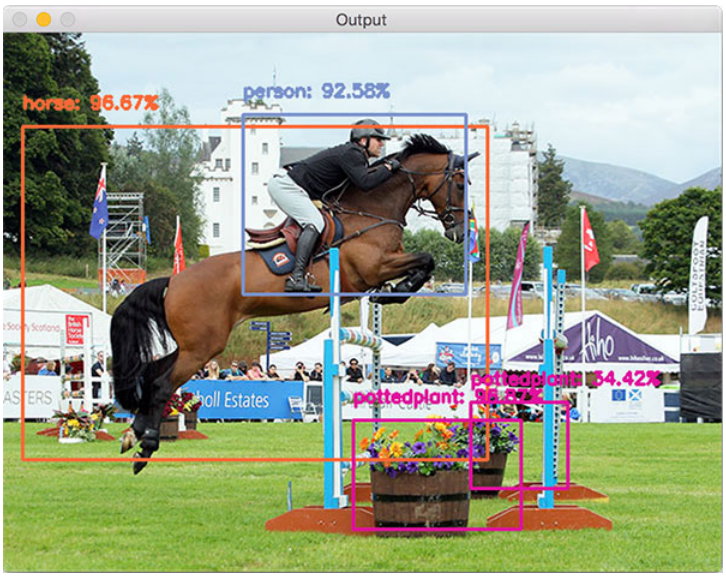
MTRE4300 Machine Learning for Robot Perception

Project #5

Due by 11:59 pm on 03/24/21 (Wednesday)

In this project, you are required to develop a Python program with the SSD (Single Shot MultiBox Detector) model implementation in Keras to detect three kinds of target objects (such as paper cups, paper boxes, oranges, balls, and so on) in the live video stream captured from your laptop camera.



In particular, the project requirements are below:

1. It is a group project. In the first line of your Python code, use a comment line to show all group members' names.
2. Please click the following link to download the SSD model implementation in Keras. https://github.com/pierluigiferrari/ssd_keras
3. Carefully read the tutorial in the above link and try to understand how to use the SSD model to implement fast visual object detection.
4. Develop your own Python program with the SSD model, which can detect the target objects (cups, boxes, oranges, balls, and so on) in an image. You may need to take many pictures and re-train the SSD model with them.
5. Your Python program should be able to continuously grab images from your laptop camera, detect the locations of all target objects in the images, and display the images with the detection results (the bounding boxes), as shown in the image in this page.
6. Each group compresses all your Python code and its related files as "SSD_tracking.zip", and uploads it to the D2L drop box. No project report is required.

Grading Rubric

- 20 points: The Python code and its related files submitted correctly.
- 30 points: The code runs without any syntax errors.
- 30 point: A live window on the computer screen shows the detection and tracking results continuously.
- 20 points. The visual detection results are a kind of success (above 80%).