TEAM ANGRY NERDS

People usually do not recognize the difference between object detection and tracking. Object detection is checking the position of an object in a frame whiles object tracking is finding the position of a particular object in multiple frames over time and seeing it as the same. We combined object detection and tracking in our computer vision model.

Our computer vision model is specifically designed for stores where users entering and leaving the establishment can be tracked and counted.

We are a group of 6 people.

Our model was developed using Python. We used OpenCV for the image processing, Dlib for checking correlation between objects and a tracker for tracking people. We also used Mobilenet SSD. Since it is a single shot detector, people in the image can be detected quickly thus increasing the overall speed of the model. The model is also very lightweight and would be easy to use it in an embedded system.

Our model is designed to detect only people and not other objects. The model assigns id’s to people detected in a frame. Bounding box coordinates for people in a detection are taken and the centroid is calculated and stored. Euclidean distances between the position of people in the new frame detected and the position of the detection in the old frame are calculated. The person in the new frame with the minimum Euclidean distance is assigned the same id (identified as the same person by the model). The new position or centroid is then updated. This continuous till the person is out of sight.

To increase the speed of the model, 30 frames are skipped before a detection is made. When a person detected in a previous frame is undetected for 40 consecutive frames, the person is marked as disappeared and the id assigned to the person is removed.

The person can be recorded as entering or leaving the establishment by the model by calculating the difference in y-coordinates of the person for change in position in two consecutive frames and their movement towards an imaginary line drawn by the model.

These numbers are recorded and displayed.