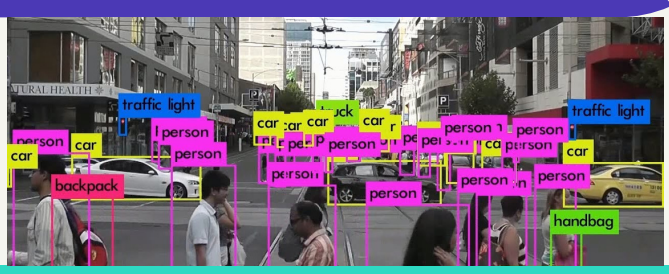
Machine Learning Model Powered Shoplifting Detection For Shops, Airports, BookStores ProgressReport

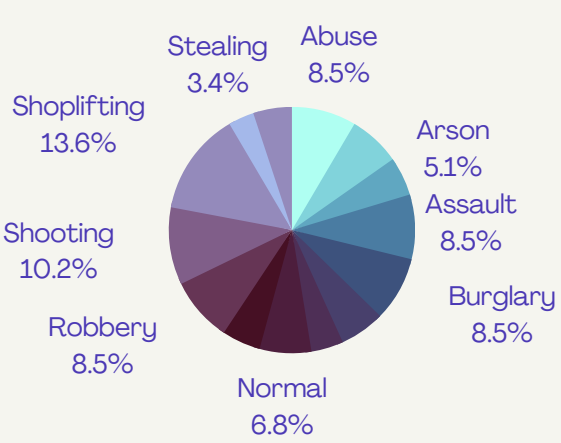
Using machine learning model to find shoplifter and his actions.



Object Discovery is feting an case of object classes over a wide range of image data using computational ways or the raw eye. Object discovery and image processing have been a frequent exploration over the times due to their numer- ous practical operations. Increasing crime rate became the main subject of the project. Thanks to the YOLOv3(You Look Only Once) algorithm, it was decided whether an event was criminal(shoplifting) or normal by object recognition and object tracking.

UCF CRIME DATASET

Kaggle datasetof UCF Crime. The datasetcontains images extracted from every video from the UCF Crime Dataset.



The total image count for the train subset is 1,266,345.

The totalimage count for the test subset is 111,308.

YOLO-COCO

This is ready to use data with weights and configuration along with coco names to detect objects with YOLO algorithm.

80 names of objects (labels) that can be Detected on the image.

$$-\sum_{c=1}^{M} \delta_{x \in c} log(p(x \in c))$$

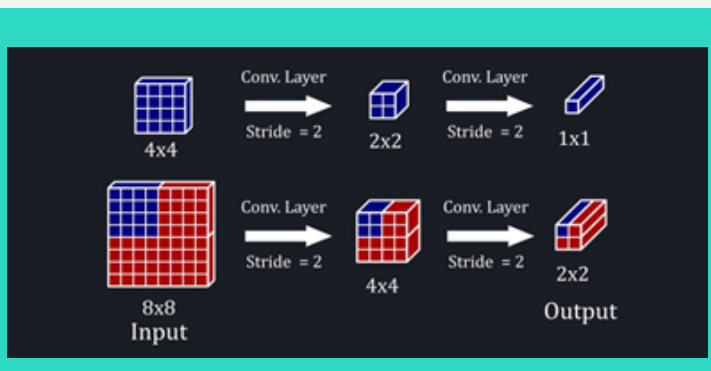
LOSS FUNCTION

Cross-entropy for the loss function.The cross-entropy loss function is calculated as follows.

$$p(x) = \frac{1}{1 + e^{-(x-\mu)/s}}$$

BOUNDİNG BOX REGRESSİON

Using logistic regression (instead of the softmax function)for predicting an objectness score for every bounding box

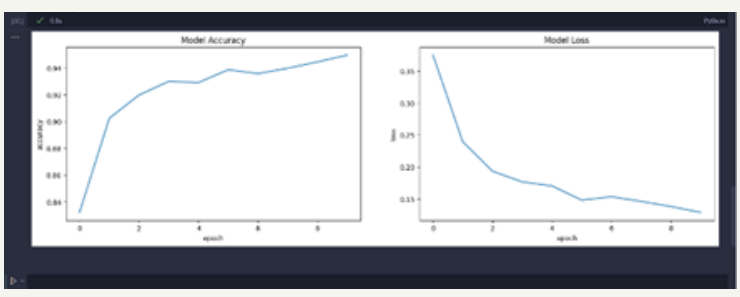


YOLO V3

The end portion of the network is only used when YOLOv3 is used as a classifier rather than for object detection. For object detection, three outputs at different featureresolutions (in this case 32x32, 16x16, and 8x8) to be fed into the detector.

MODEL ACCURACY SCORE AND LOSS

Plotting train model accuracy score and model loss



Model Accuracy *Model Loss*

Epoch 1/10 - loss: 0.3751 - accuracy: 0.8321
Epoch 2/10 - loss: 0.2396 - accuracy: 0.9024
Epoch 3/10 - loss: 0.1935 - accuracy: 0.9197
Epoch 5/10 - loss: 0.1704 - accuracy: 0.9290
Epoch 6/10 - loss: 0.1481 - accuracy: 0.9386
Epoch 7/10 - loss: 0.1534 - accuracy: 0.9357
Epoch 8/10 - loss: 0.1462 - accuracy: 0.9397
Epoch 9/10 - loss: 0.1382 - accuracy: 0.9445
Epoch 10/10 - loss: 0.1289 - accuracy: 0.9496

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