Assignment Report

1. **Object & Sub Object Detection:** Use a pre trained object detection model like YOLO, R-CNN and MobileNet for fine tune or train a model for sub-object detection.
2. **JSON Output format:** Construct hierarchical JSON output after post processing detections like:-

def generate\_json(object\_name, object\_id, bbox, subobjects):

return {

"object": obj\_name,

"id": obj\_id,

"bbox": bbox,

"subobject": [

{"object": sub["name"], "id": sub["id"], "bbox": sub["bbox"]}

for sub in subobjects

]

}

1. **Sub Object Image retrieval:** Use bounding box coordinates to crop sub-object regions from the frame.
2. **Inference Speed Optimization:** There are many ways to make it optimized which also includes possibility for future upgradation. Using a lighter weight detection model or reduce image size or even optimize the post processing steps.