OBJECT DETECTION, CLASSIFICATION AND AVOIDANCE.

RP 1

- HIERARCHICAL VIEW OF OBJECT CLASSIFICATION
- JOINT TRAINING ALGORITHM (DETECTION AND CLASSIFICATION DATA)
- BATCH NORMALIZATION
- HIGH RESOLUTION CLASSIFIER – YOLO V2
- CONVOLUTIONAL WITH ANCHOR BOXES
- DIMENSION CLUSTERS
- MULTI-SCALE TRAINING

RP 2

- DARKNET-19 - NEW CLASSIFICATION MODEL TO BE USED AS THE BASE OF YOLOV2

RP 3

- TWO-STAGE DEEP LEARNING BASED OBJECT DETECTORS INVOLVE A TWO-STAGE PROCESS CONSISTING OF 1) REGION PROPOSALS AND 2) OBJECT CLASSIFICATION
- POPULAR TWO-STAGE DETECTORS INCLUDE RCNN, FAST R-CNN, AND FASTER R-CNN
- FASTER R-CNN USED A SIMILAR APPROACH TO FAST R-CNN, BUT INSTEAD OF USING A SELECTIVE SEARCH ALGORITHM FOR THE ROI PROPOSAL, IT EMPLOYED A SEPARATE NETWORK THAT FED THE ROI TO THE ROI POOLING LAYER AND THE FEATURE MAP, WHICH WERE THEN RESHAPED AND USED FOR PREDICTION
- SINGLE-STAGE OBJECT DETECTORS SUCH AS YOLO (YOU ONLY LOOK ONCE) ARE FASTER THAN TWO-STAGE DETECTORS AS THEY CAN PREDICT OBJECTS ON AN INPUT WITH A SINGLE PASS
- RECENT YEARS HAVE SEEN GROWING INTEREST IN 3D OBJECT DETECTION WITH DEEP LEARNING
- COMPLEX-YOLO, AN EXTENSION OF YOLOV2, USED A EULER REGION PROPOSAL NETWORK (E-RPN), BASED ON AN RGB BIRDS-EYE-VIEW (BEV) MAP FROM POINT CLOUD DATA TO GET 3D PROPOSALS

YOLO V8

- YOLOV8 HAS A NUMBER OF IMPROVEMENTS OVER YOLOV2, INCLUDING:BETTER ACCURACY: YOLOV8 HAS BEEN SHOWN TO ACHIEVE BETTER ACCURACY THAN YOLOV2 ON A NUMBER OF OBJECT DETECTION BENCHMARKS
- IN ADDITION, YOLOV8 INCLUDES A NUMBER OF NEW FEATURES, SUCH AS:SUPPORT FOR INSTANCE SEGMENTATION: YOLOV8 CAN NOW PERFORM INSTANCE SEGMENTATION, WHICH IS THE TASK OF IDENTIFYING AND SEGMENTING INDIVIDUAL OBJECTS IN AN IMAGE
- A NEW LOSS FUNCTION: YOLOV8 USES A NEW LOSS FUNCTION THAT IS DESIGNED TO IMPROVE ACCURACY AND REDUCE LOCALIZATION ERRORS

DEEP SORT

- DEEPSORT IS A TRACKING ALGORITHM THAT CAN BE USED WITH YOLOV8 OR OTHER OBJECT DETECTION MODELS TO TRACK OBJECTS IN VIDEOS
- DEEPSORT CAN BE USED TO TRACK A VARIETY OF OBJECTS, INCLUDING PEOPLE, VEHICLES, AND ANIMALS, IT IS PARTICULARLY USEFUL FOR TRACKING OBJECTS IN REAL-TIME, SUCH AS IN TRAFFIC MONITORING SYSTEMS OR SECURITY SYSTEMS