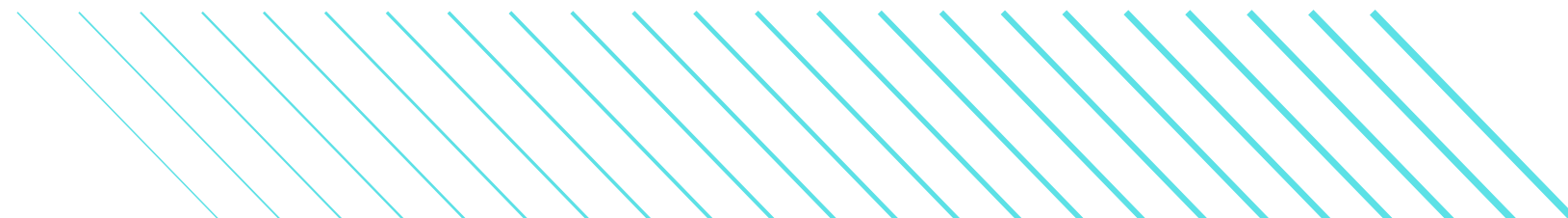




# **OBJECT DETECTION, CLASSIFICATION AND AVOIDANCE.**



# 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**