

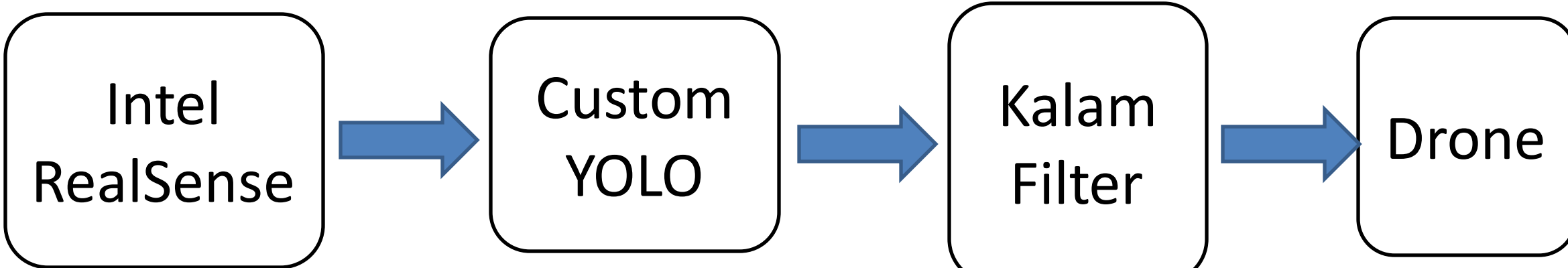
Custom YOLO Computer Vision algorithm for object detection and tracking for UAV pursuit-evasion scenarios

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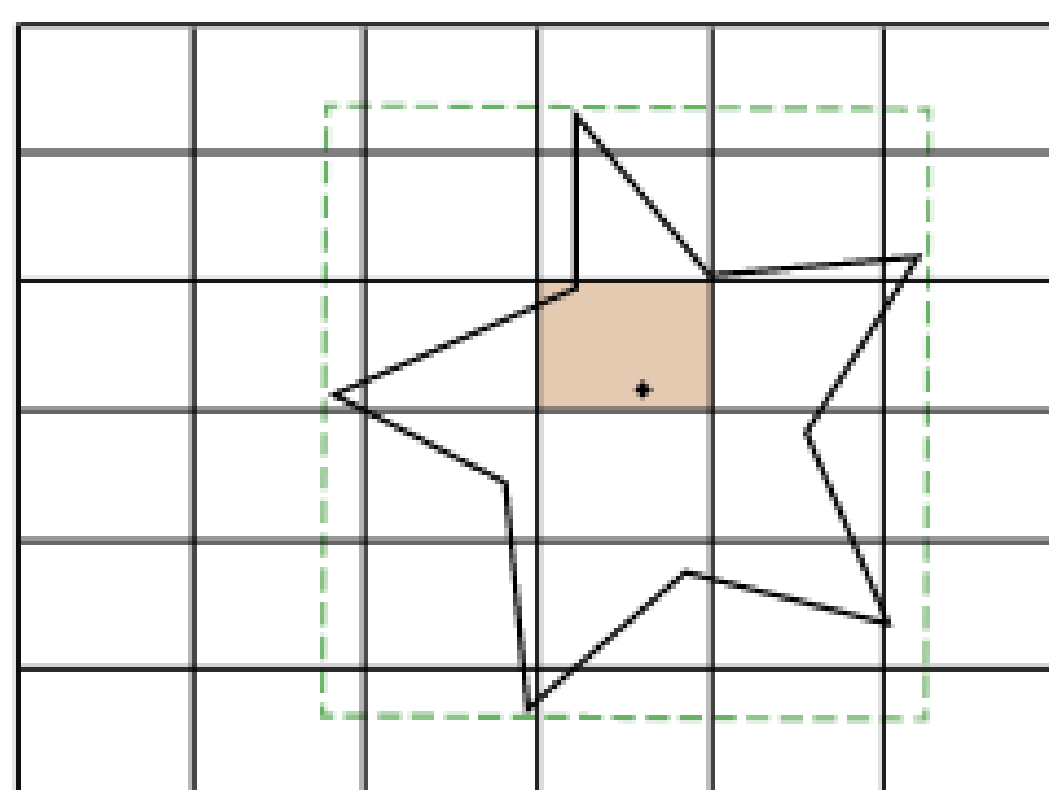
Research Question

Radar system and other tracking systems are not as effective to track and intercept real time. Developing camera-based tracking system using YOLOv3 algorithm. Developing a new kind of Computer vision algorithm based on YOLOv3 and adding masking features for image segmentation and detection using adding brand-new feature decoder with a single output tensor that goes to head with higher resolution that solves two principal YOLO's issues: rewriting of labels and incorrect distribution of anchors.

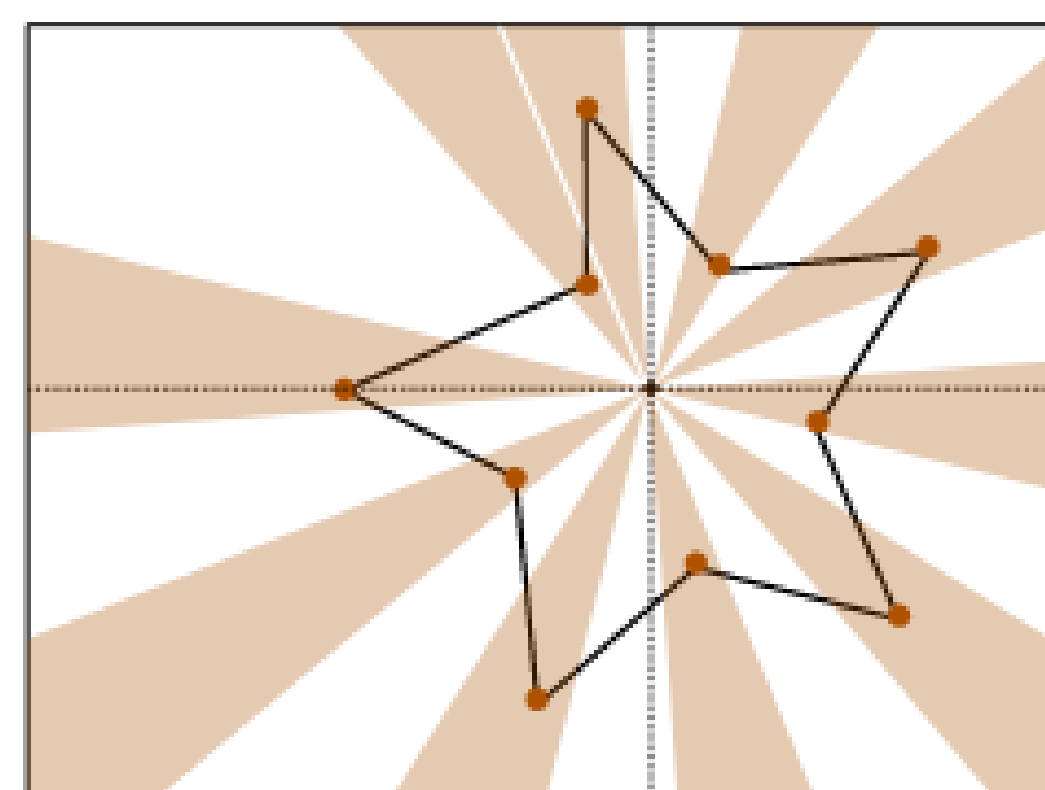
Methodology



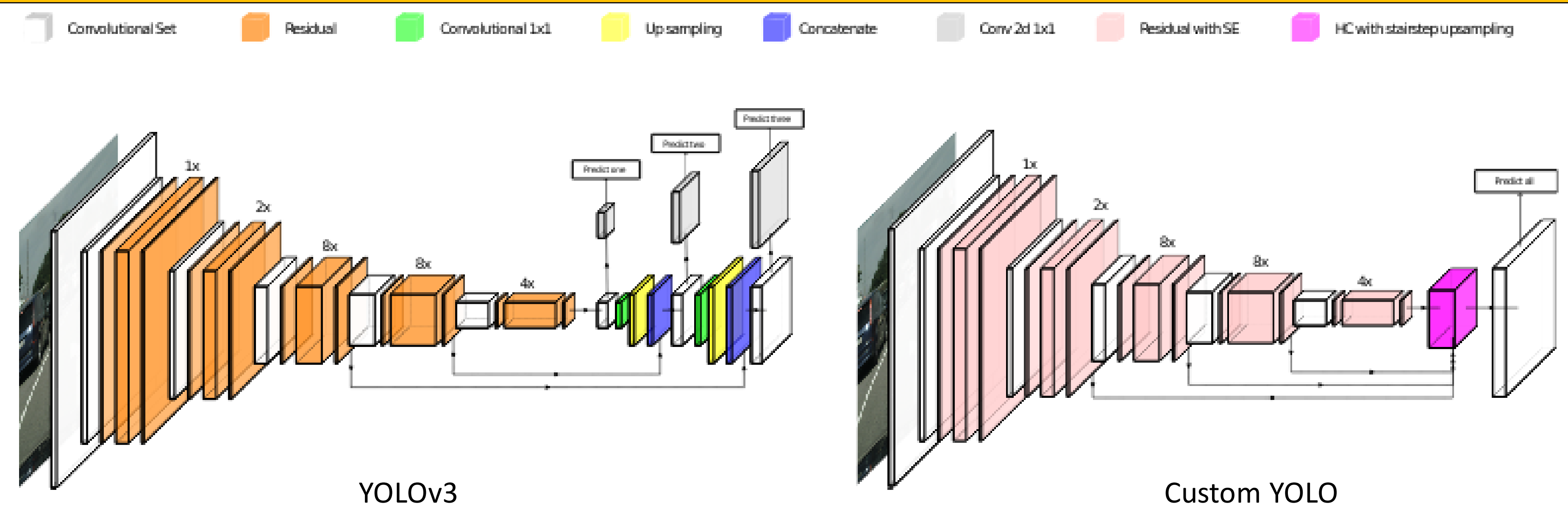
YOLOv3



Custom YOLO



Difference Between Standard YOLOv3 and our Custom YOLO architecture



Custom YOLO

- We design an extension that realizes instance segmentation using bounding polygon representation. The number of maximal polygon vertices can be adjusted according to a requirement to a precision.
- The bounding polygon is detected within a polar grid with relative coordinates that allow the network to learn general, size-independent shapes. The network produces a dynamic number of vertices per bounding polygon.
- The Algorithm is trained to detect 40 different objects and accurately detect the distance of the object

Future Work

Next Semester our research will be focused on integrating the custom YOLO with kalam filter and perform real time UAV pursuit and evasion.

Custom YOLO in action

