

Waymo Open Dataset

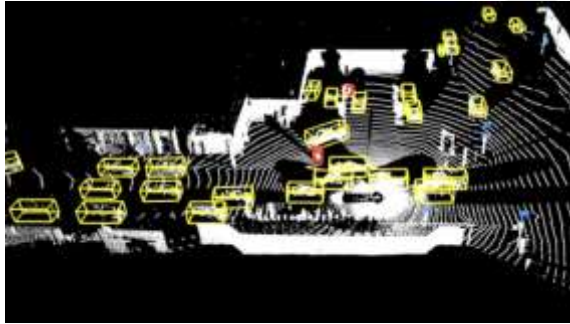
Ted Lewitt, Eric Ye, Jack Elliott

Problem Statement

- Can we construct a model that outputs the weather of an image?
- Can we construct a model that detects objects affecting a driver?

The Dataset

- 200 Sequential Frames
- 2D Images
- 3D Point Clouds
- Labels!



Significance

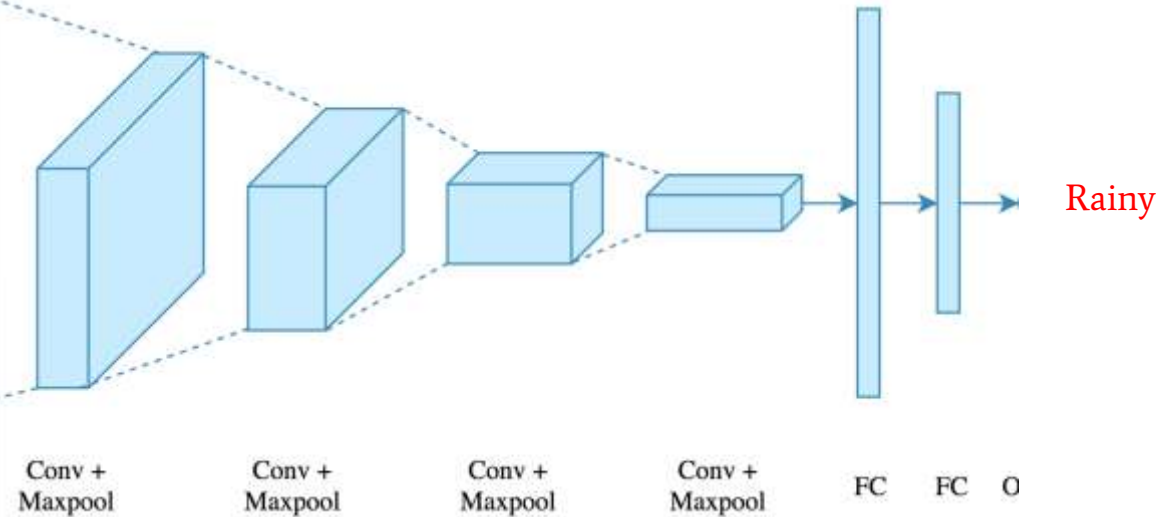
Autonomous Vehicles

- Safety
- Traffic
- Accessibility



Challenge 1: Weather Classification

Accuracy: 93%

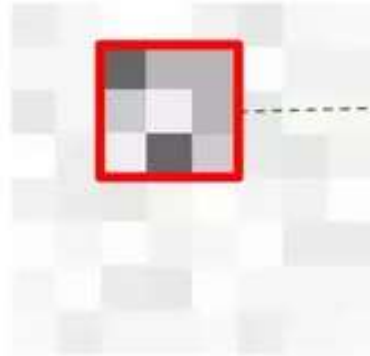


Challenge 2: Object Detection

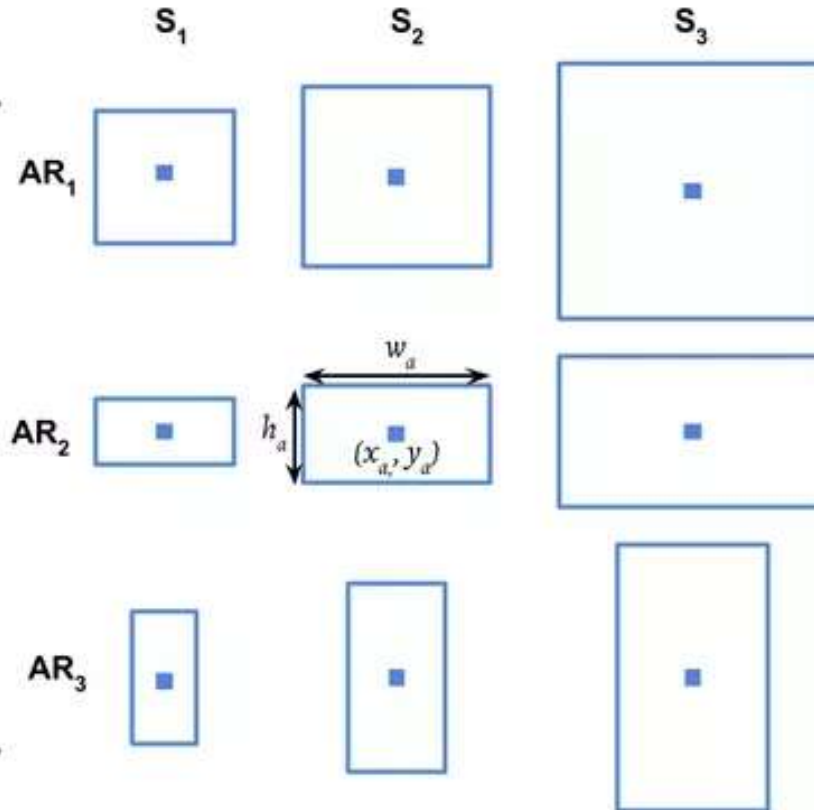


Region Proposal Networks

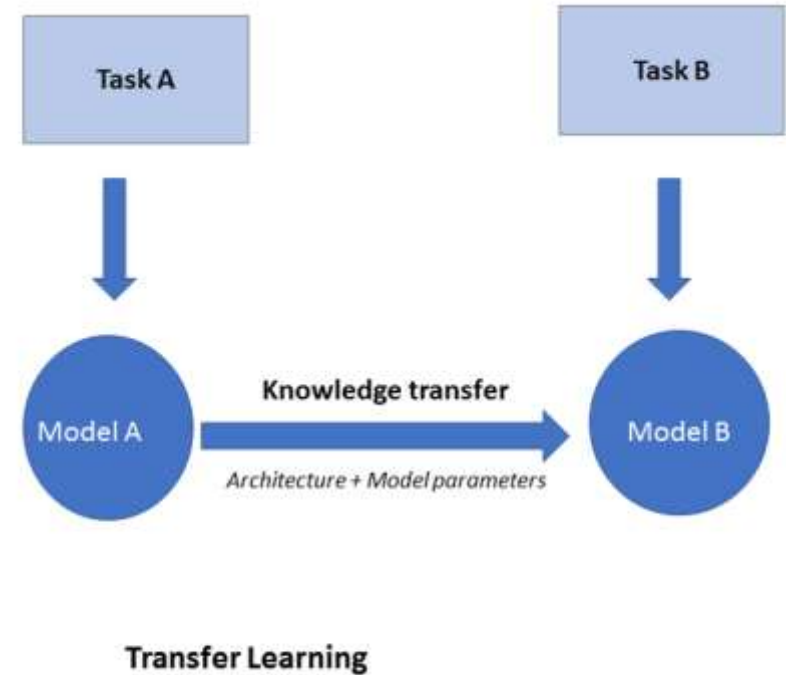
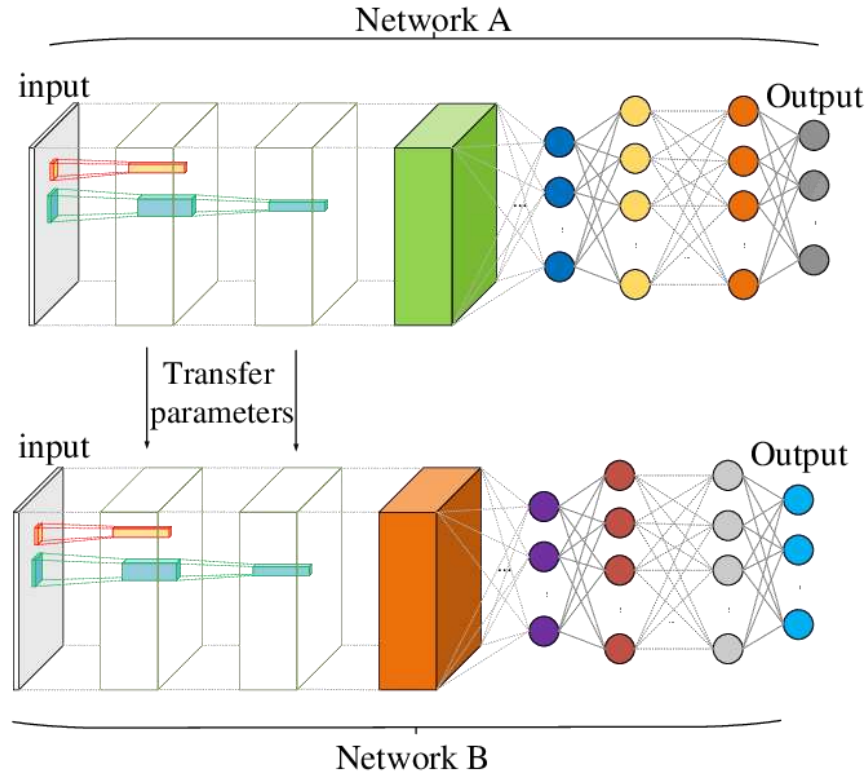
Generate 9 anchors for each **sliding window** on conv. feature map



w_a : anchor's width
 h_a : anchor's height
 x_a, y_a : anchor's center



Transfer Learning with Faster RCNN



Results

| Metrics | Untrained | Trained |
|-----------------|-----------|---------|
| IoU | .6084 | .8632 |
| Accuracy | .9034 | .9964 |

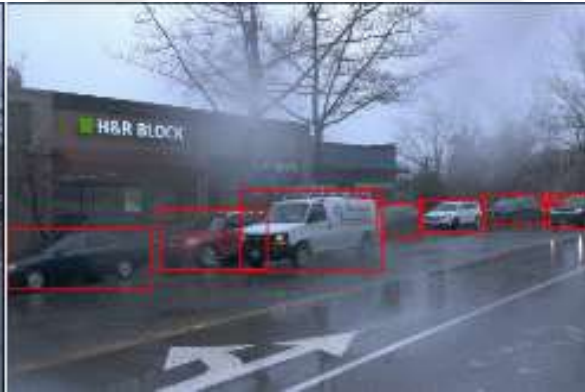
$$\text{IoU} = \frac{\text{Area of Overlap}}{\text{Area of Union}}$$



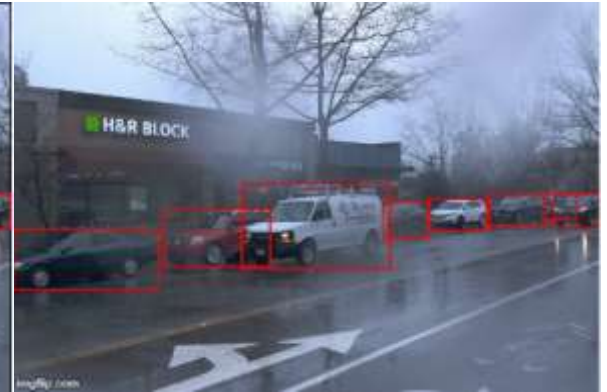
Visualization!



Raw



Our Predictions



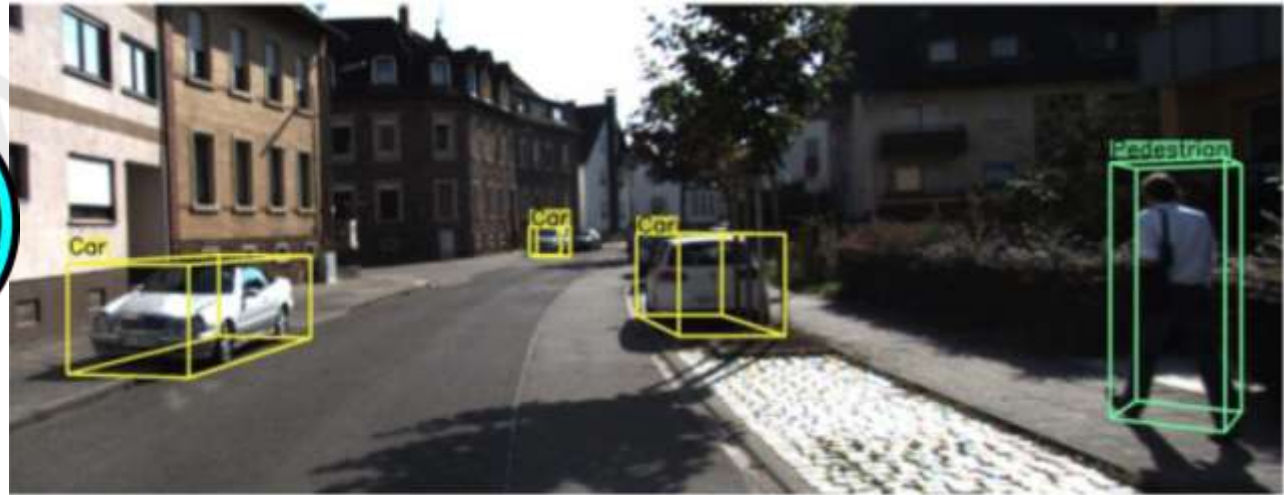
Ground Truth

Next Steps

- 2D Object Tracking
- 3D Object Detection
- Other Algorithms



YOLO



Questions?

