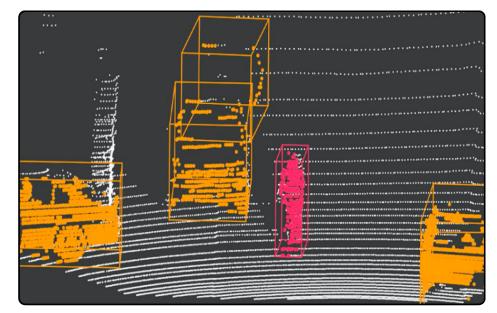
# **Goal #1: Multi-Sensor Perception - PointPainting**

A method where information inferred from a camera is combined with a LiDAR point cloud to improve performance in 3D object detection.



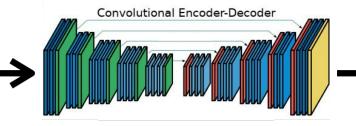


Vora, Sourabh, et al. "Pointpainting: Sequential fusion for 3d object detection." *Proceedings of the IEEE/CVF Conference* DRIVERLESS on Computer Vision and Pattern Recognition. 2020.

# **Step 1: Inferring information from a camera**

How is this done?







Camera Image

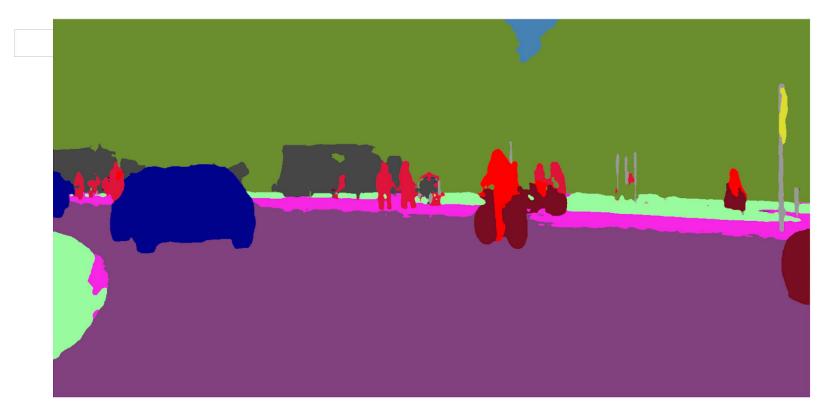
Semantic Segmentation Model

Pixelwise 'class' Scores



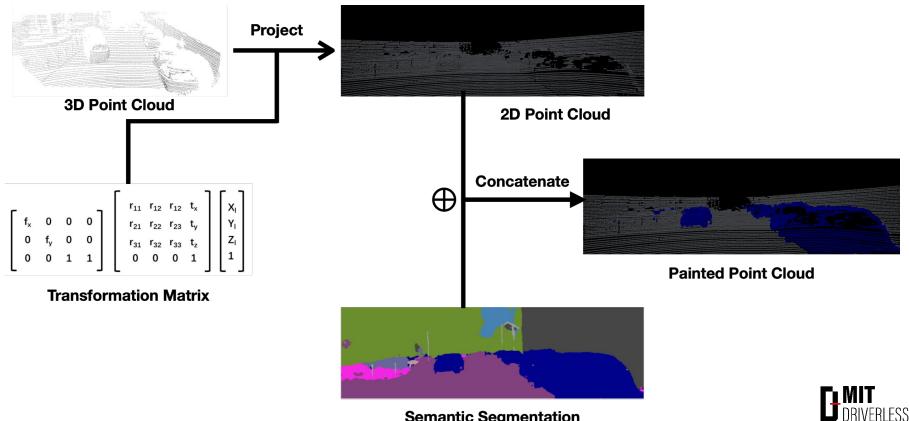
L.-C. Chen, et al. "Encoder-decoder with atrous separable convolution for semantic image segmentation." *Proceedings of the European conference on computer vision.* 2018.

## **Step 1: Inferring information from a camera**





# **Step 2: Combine with LiDAR Point Cloud**



**Semantic Segmentation** 

## **Step 2: Combine with LiDAR Point Cloud**

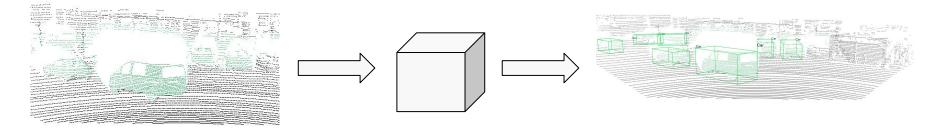
#### Lidar

**PointPainted** 

#### Camera



### **Step 3: Develop 3D Object Detection Model**



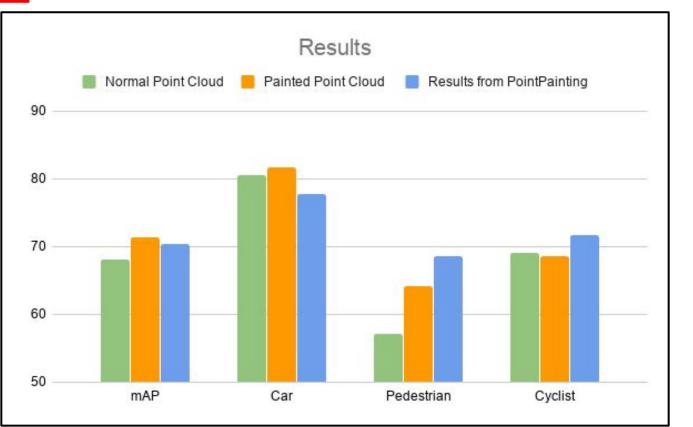
'Painted' Point Cloud

3D Object Detection Model

Detection of objects in point cloud



### **Results**





### **Conclusion: Putting it all together**

