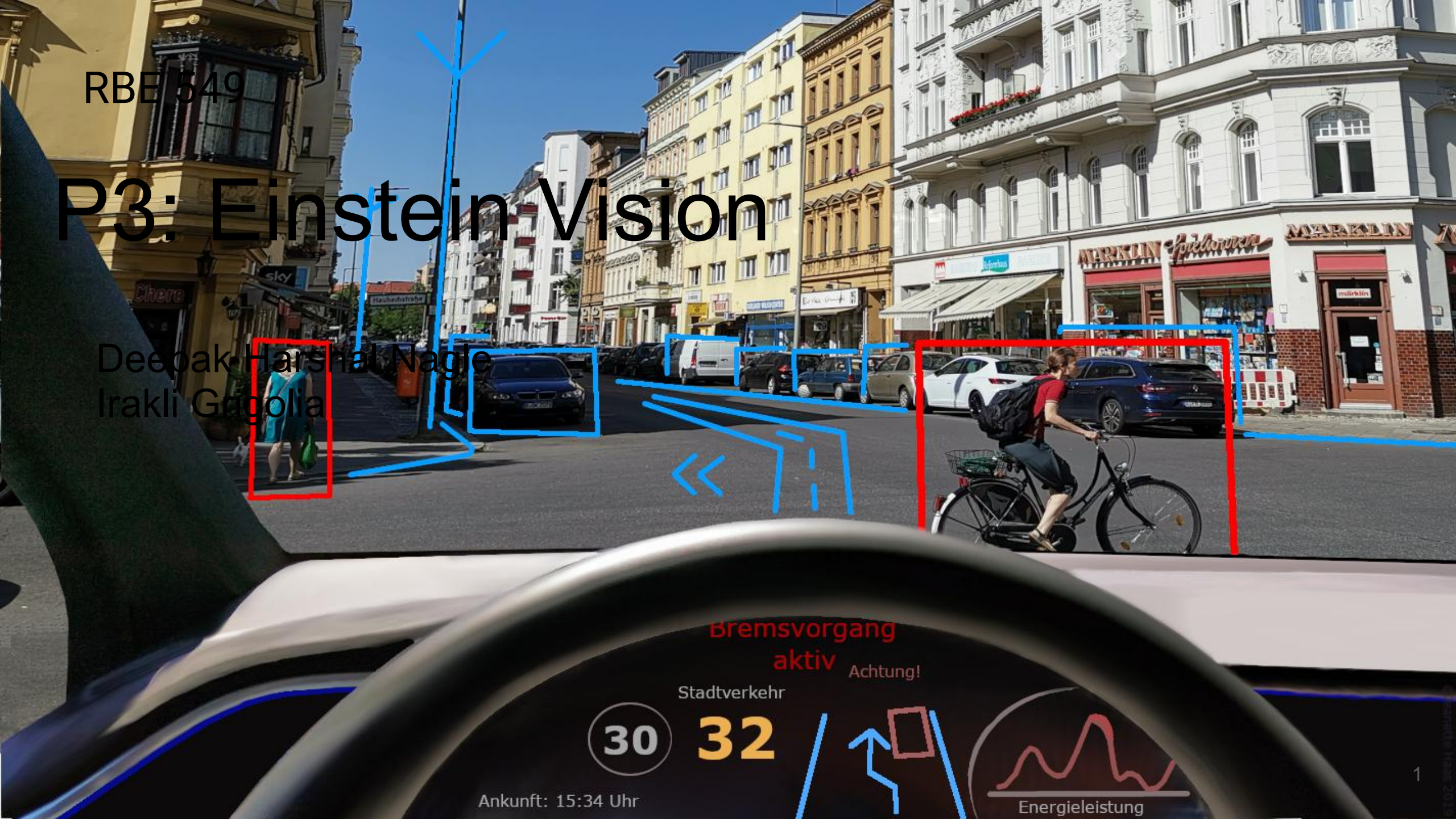
RBE 549

# P3: Einstein Vision

Deepak Harshal Nagle
Irakli Grigolia

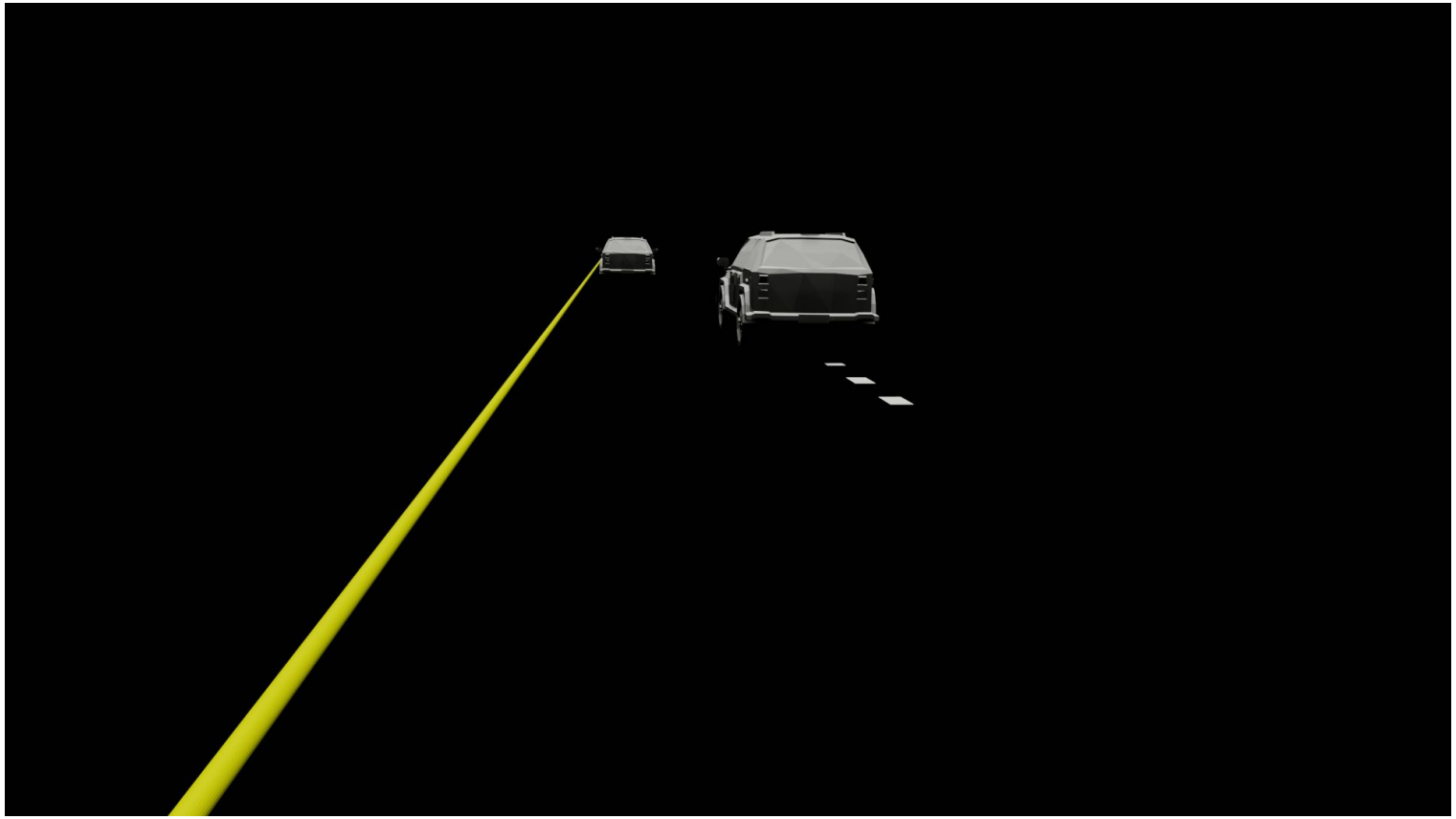


# Overview:

1. Vehicle detection, classification using YOLOv3, 3-D bounding boxes, classical approaches
2. Lane Detection Using YOLOPv2 and classical approaches
3. Monocular Depth Estimation using Transformer based MIDAS
4. Road Signs using  YOLOv3
5. Traffic lights using YOLOv5
6. Other objects, Blender tricks

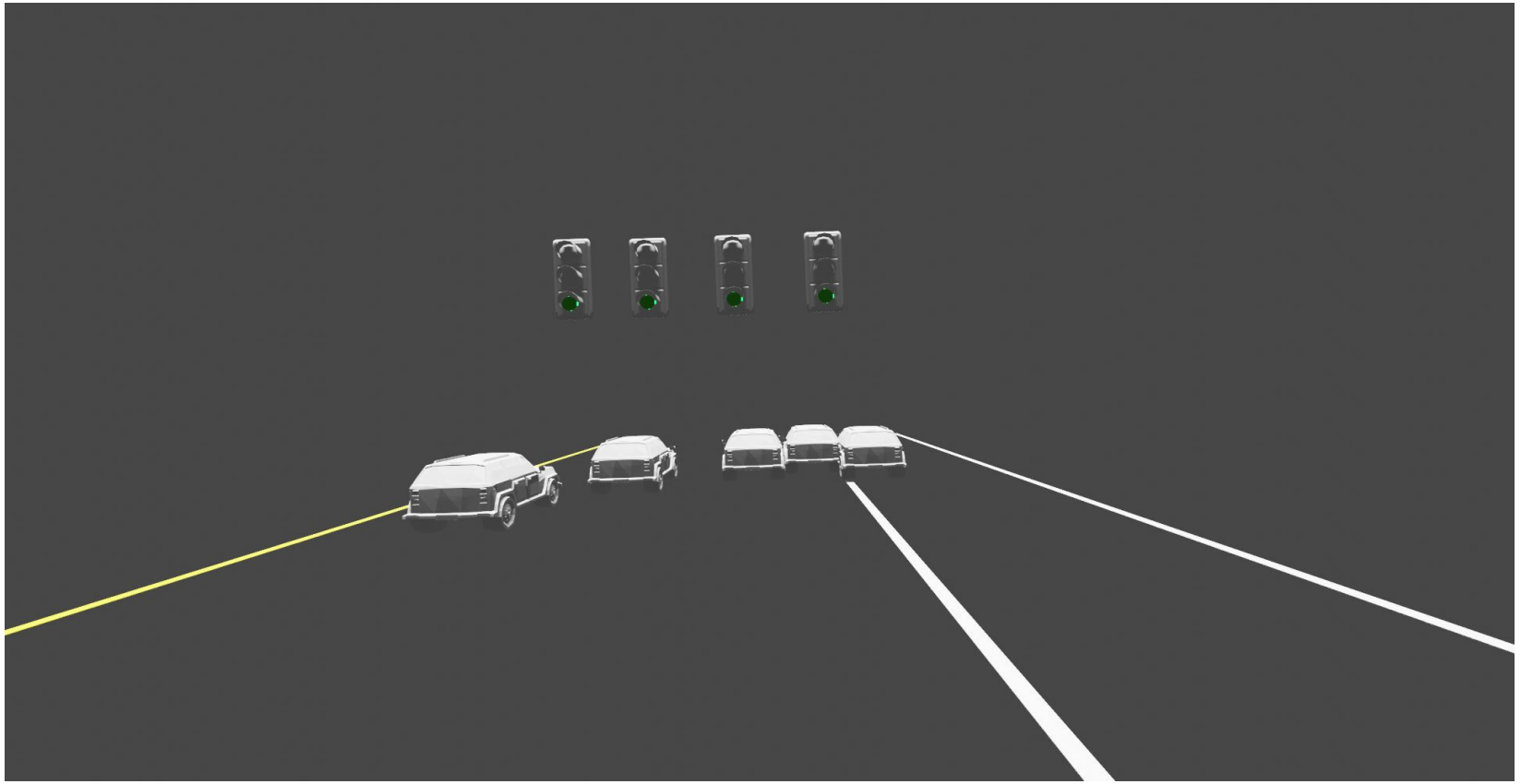
# Vehicle detection, classification using YOLOv3

- Yolo 3D model was used for Vehicle Detection and classification



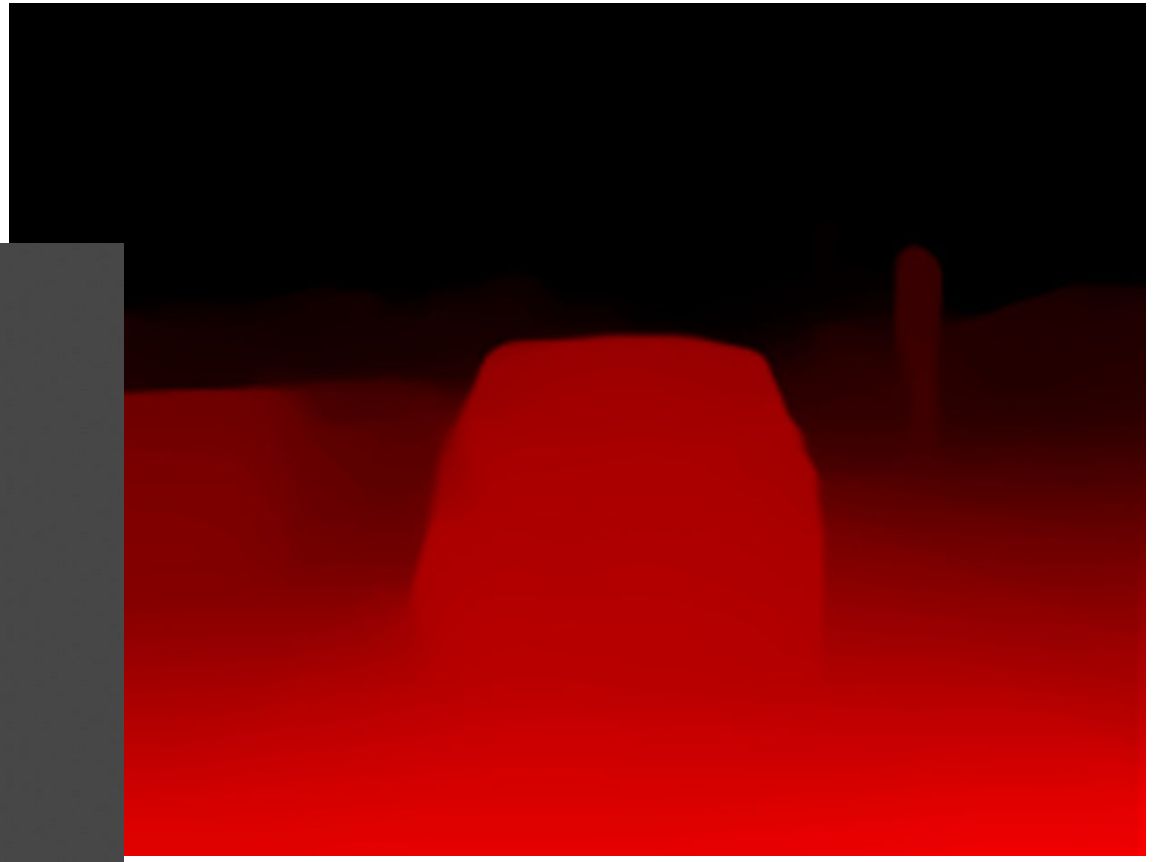
# Lanes - YOLOPv2 and classical approaches

- YOLOPv2 and LaneNet were used for lane detection
- We detected the lane points from the images, projected them in 3-D and rendered them on blender



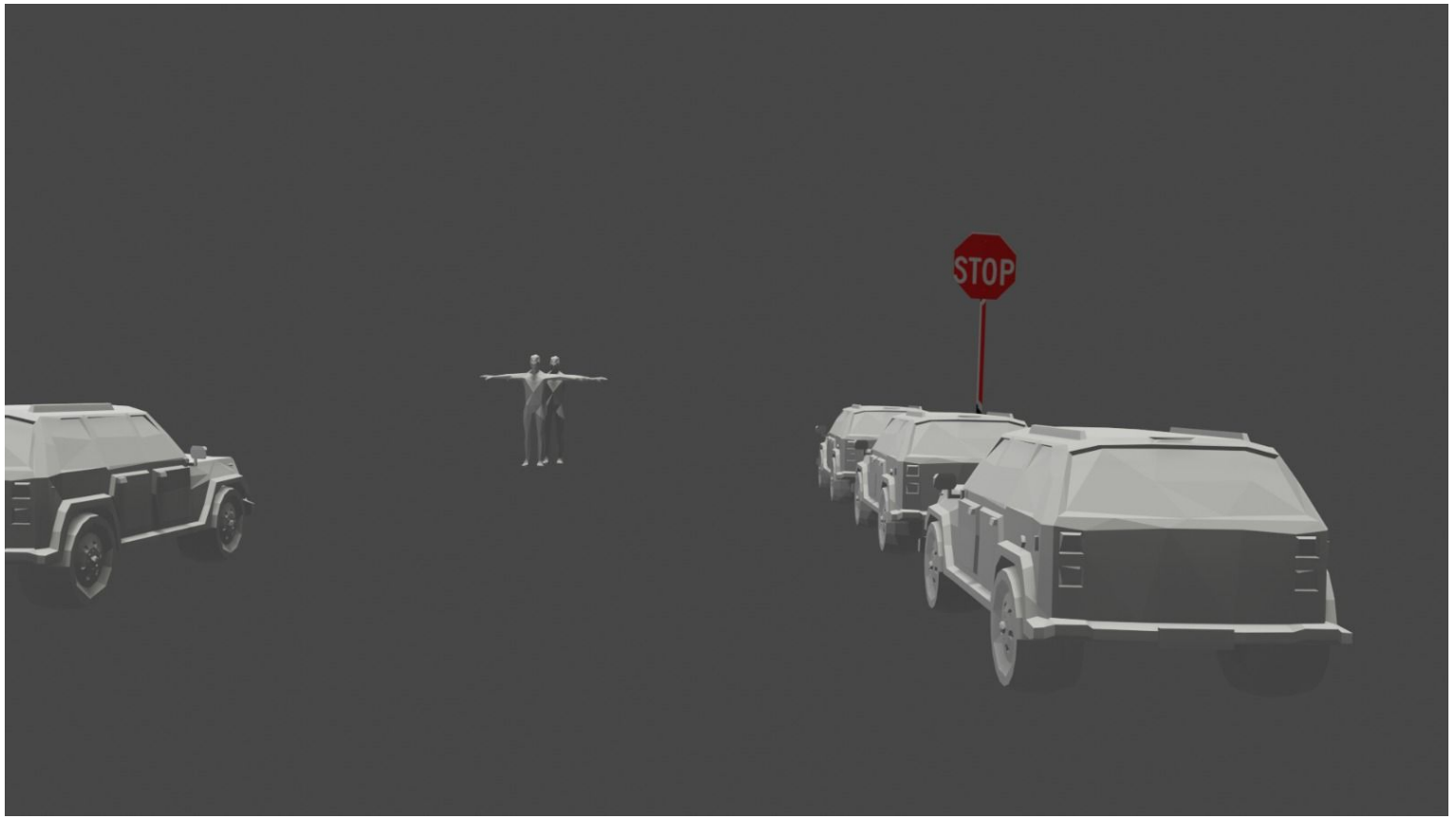
# Monocular Depth Estimation using Transformer based MIDAS

1. Depth Map
2. Exponential Fitting
3. Scale estimates



# Road Signs

- Detected Road signs using YOLOv3
- Addition of an extra plane for pasting the .png image on blender Road signs



# Traffic Light

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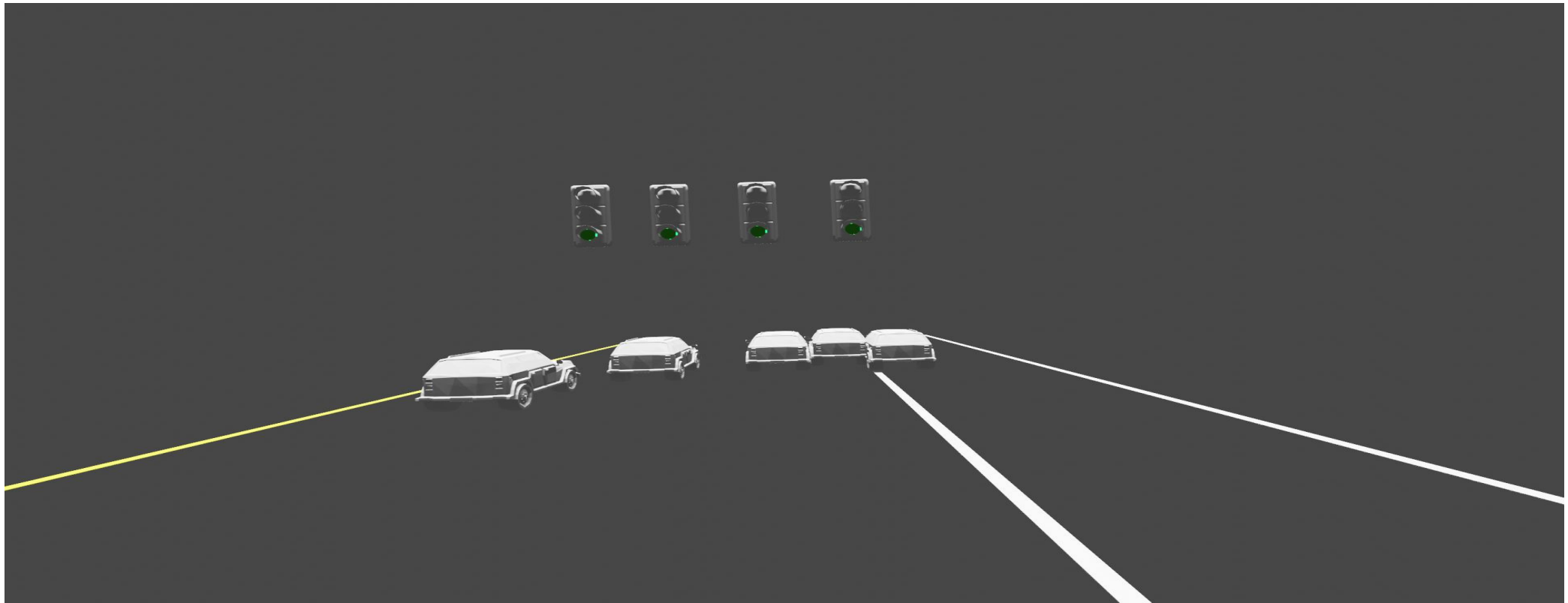
1. Used MS COCO-based YOLOv3 to detect the traffic lights

2. Created different assets for different lights and performed color thresholding



# REFERENCES


1.Lane Detection: https://github.com/CAIC-AD/YOLOPv2
2. Lane Detection: https://github.com/IrohXu/lanenet-lane-detection-pytorch
3. Monocular Depth Estimation: https://github.com/isl-org/MiDaS
4. Object Detection: Cars, Trucks, Traffic Lights, Road Signs: https://github.com/xiaogangLi/tensorflow-MobilenetV1-SSD
5. Object Detection: Cars, Trucks, Traffic Lights, Road Signs: https://github.com/WongKinYiu/yolov7
6. Object Detection: Traffic Lights: https://github.com/sovit-123/Traffic-Light-Detection-Using-YOLOv3
7. Object Detection: Road Signs: https://github.com/Anant-mishra1729/Road-sign-detection
8. YOLO 3-D bounding boxes: https://github.com/ruhyadi/YOLO3D
9. Pedestrian keypoint detection: https://github.com/ZheC/Realtime/Multi-Person/Pose/Estimation


Thank you!
100m
48
mph
Self-Driving