

BUILD YOUR OWN

---

**SELF DRIVING VEHICLE**

- Build your own toy car that can drive itself
- Drive your car with your phone or laptop
- Record images, steering angles & throttles
- Train neural net pilots to drive your car on different tracks
- Race your car in a DIY Robocars race
- (from: <http://www.donkeycar.com/>)



### HARDWARE

- Remote controller car
- Raspberry Pi 3 (or something with more computational power)
- Raspberry Pi camera
- Wide angle lens
- Servo driver
- Mount

**ALL THESE YOU CAN BUY FROM AMAZON FOR ~\$250**

## SOFTWARE KNOWLEDGE

- ROS
- Deep Learning
- PID controller

*If you want to get fancier*

- Computer vision (e.g. lane detection)
- Path planning

**ALL THESE TECHNIQUES YOU HAVE LEARNT THROUGH CLASSES!**

# BEHAVIOR CLONING (TERM 1 PROJECT 3)

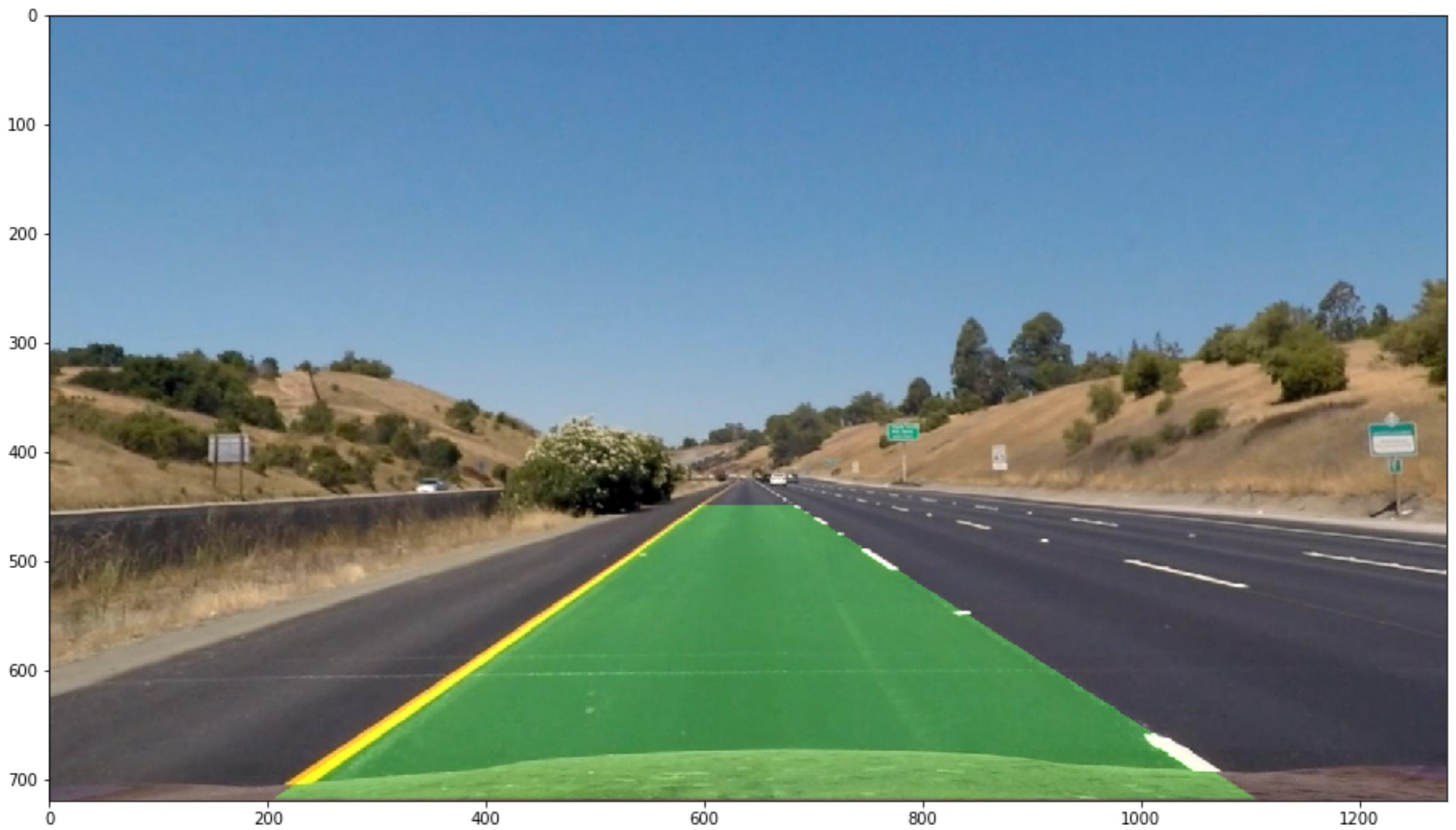
Determine the steering angle and throttle from camera

```
Total memory: 3.94GiB
Free memory: 3.91GiB
I tensorflow/core/common_runtime/g...
DMA: 0
I tensorflow/core/common_runtime/c...
0: Y
I tensorflow/core/common_runtime/g...
Creating TensorFlow device (/gpu:...
e: GRID K520, pci bus id: 0000:00:...
11803/11803 [=====
ss: 0.0341 - val_loss: 0.0513
Epoch 2/3
11803/11803 [=====
ss: 0.0291 - val_loss: 0.0483
Epoch 3/3
11803/11803 [=====
ss: 0.0277 - val_loss: 0.0469
(carnd-term1) carnd@ip-172-31-37-3
```



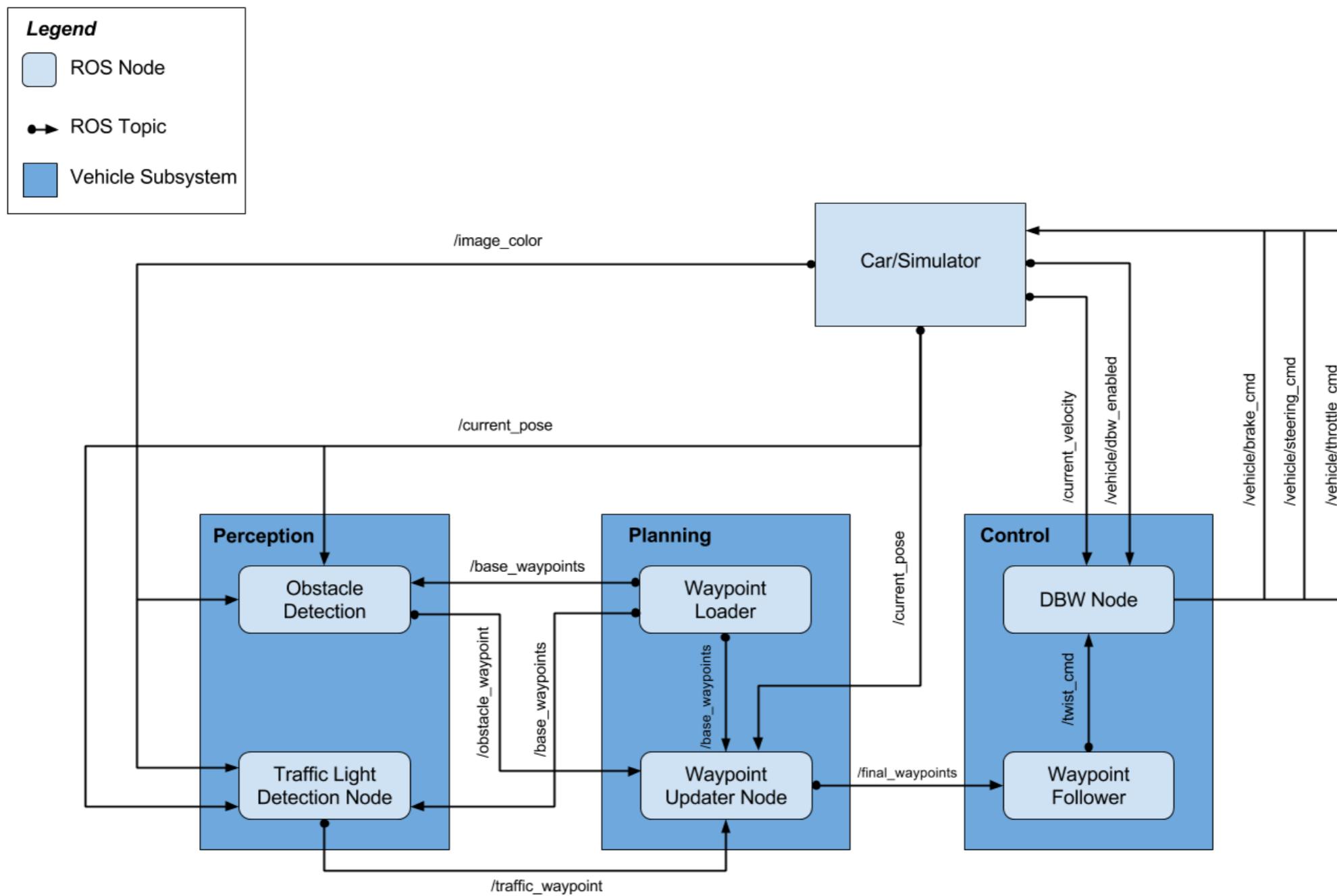
# LANE DETECTION (TERM 1 PROJECT 4)

Determine the coordinates of lane boundary

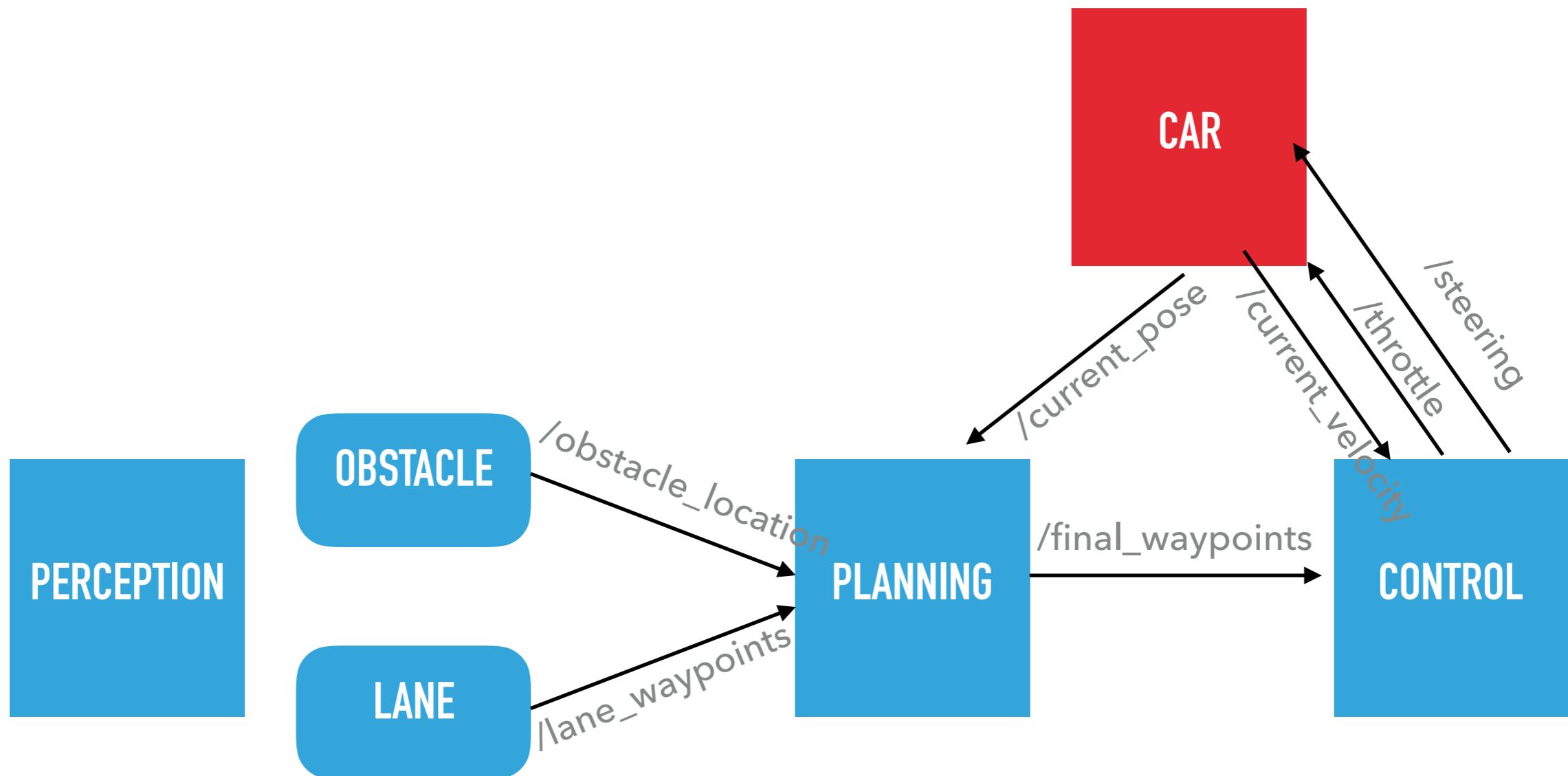


# ROS (CAPSTONE PROJECT)

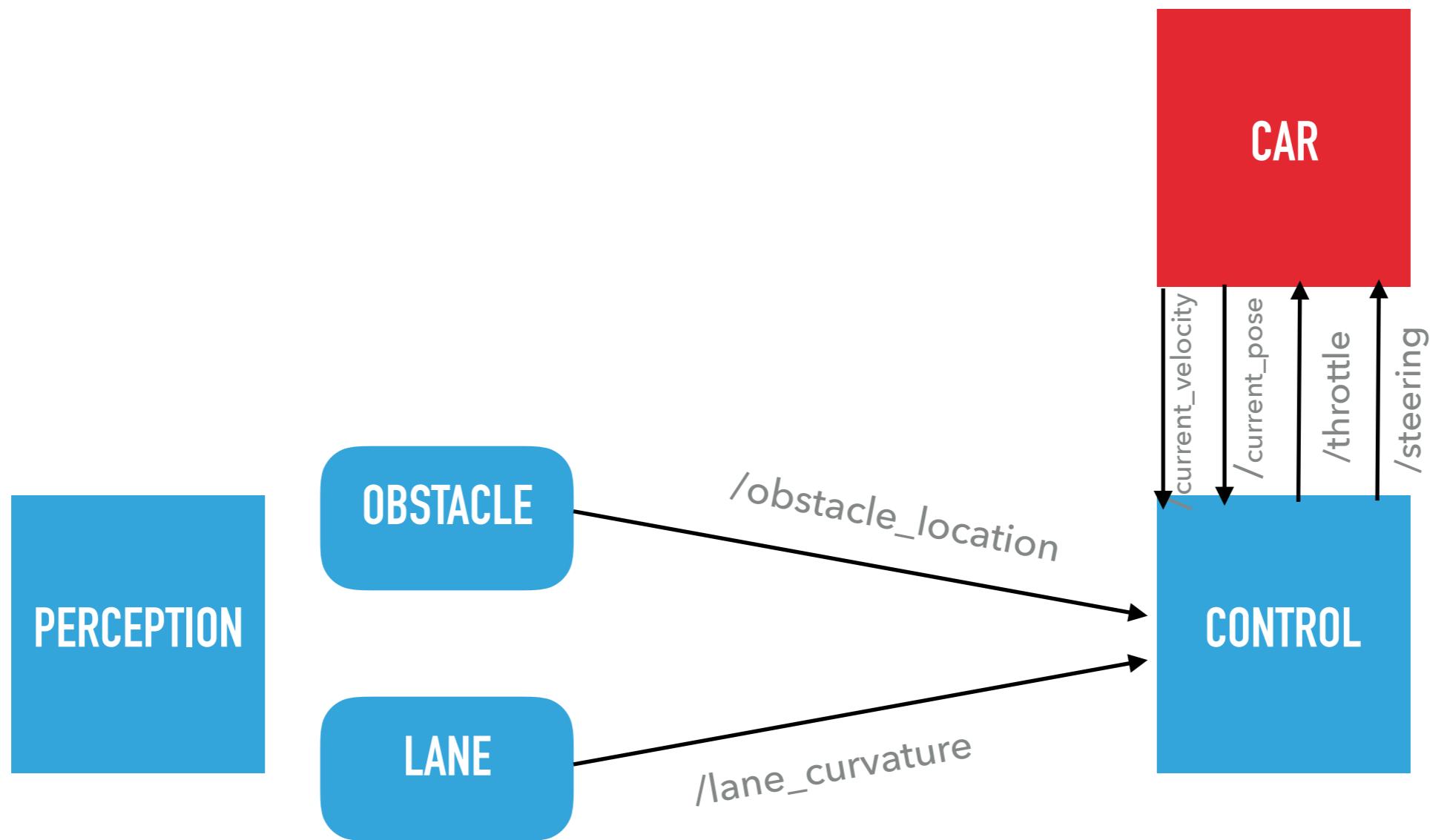
It will be much simpler than this !



# PROPOSED ROS 1 (FOR THIS PROJECT)



## PROPOSED ROS 1 (FOR THIS PROJECT)





FEEL FREE TO COME UP  
WITH YOUR OWN IDEA!

---

QUESTIONS?  
[GANG.K.YANG@GMAIL.COM](mailto:GANG.K.YANG@GMAIL.COM)