SELF-DRIVING CAR: Finding Lane Lines

WHAT IS COMPUTER VISION?

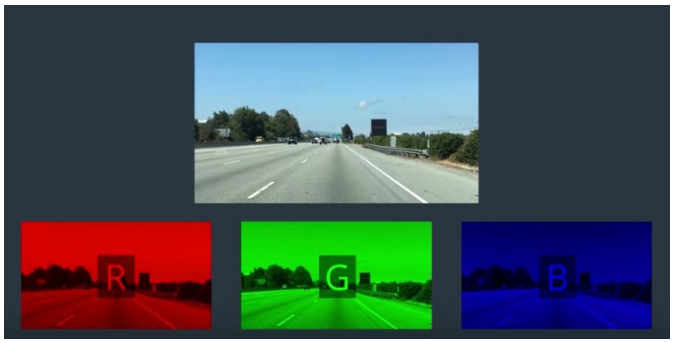
Computer vision is a scientific field, often drawing from artificial intelligence and machine learning, that aims to teach computers to “see” by getting the computer to understand and appropriately respond to information gathered from the content of digital images.

STEPS TO FIND LANE LINES

Useful features for identifying lane lines: color, shape, orientation, position

We’ll start with color detection, then region masking, then finding edges, and finally using a Hough Transform to identify line segments

COLOR SELECTION



Values from 0 (dark) to 255 (bright) in Red, Green, and Blue color channels

REGION MASKING

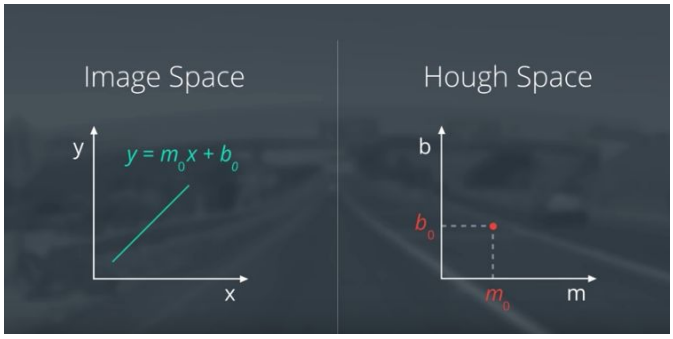
Add criteria in code to only focus on a specific region of an image, since lane lines will always appear in the same general part of the image

CANNY EDGE DETECTION

Find edges by looking for strong gradient, i.e. very different values between adjacent pixels

edges = cv2.Canny(gray, low_threshold, high_threshold)

HOUGH TRANSFORM



A line in image space can be represented as a single point in parameter space, or Hough Space

REFERENCES

- “A Gentle Introduction to Computer Vision”
- Udacity free course Intro to Computer Vision
- OpenCV.org
- Matplotlib documentation