

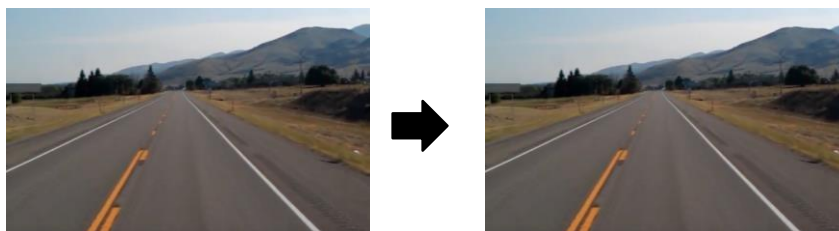
AI & ML Capstone Project

09th October 2020

Topic: Self-Driving Vehicle: Lane Detection

Implementation of a completely autonomous self-driving car such as a Tesla involves the use of many external sensors and a lot of dependence on Deep Neural Networks for tasks such as object detection for understanding the nearby environment, traffic lights and safety signs detection and so on. However, one of the most crucial task is to make the car drive in one particular lane. Whenever we drive, these lanes guide us where a road takes us and act as reference for where to steer. Thus, this fundamental knowledge is required by self-driving vehicles as well. In this project we aim to tackle the problem of lane detection given a set of images from a car dashboard or videos (e.g. dataset: <https://xingangpan.github.io/projects/CULane.html>, you can choose any such video or dataset for this purpose).

- a) Implement an auto-encoder model that takes the image as input and outputs the images with the lanes marked. You may instead use python along with OpenCV to implement this as well. Your final goal is to detect the two adjacent lanes (one on left and one on right) given an image. Sample input and output:



- b) Once the lanes have been detected, use these lanes as guidelines to decide the steering angle (Steering angle will depend on the center of the captured image and the center of the lanes detected).

