Self-Driving Car
Final Project „Artificial Intelligence" WS 17/18
Lukas Deeg and Martin Huber

Introduction

Our goal is to implement a self-driving car, which learns via behavioural cloning. For this task we use the environmnet given by udacity's „self-driving car" [1]. To evaluate our results we train and test our car on different tracks.
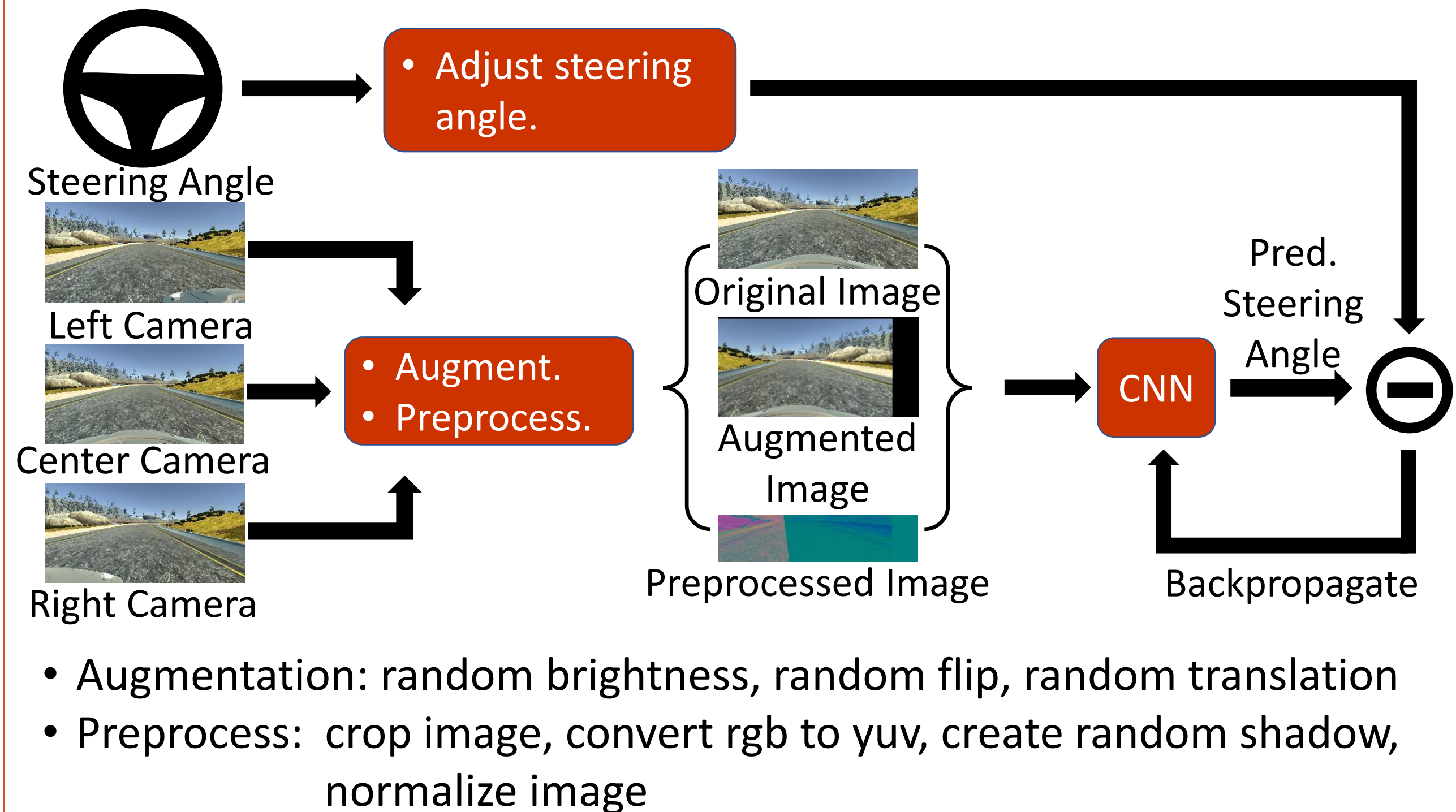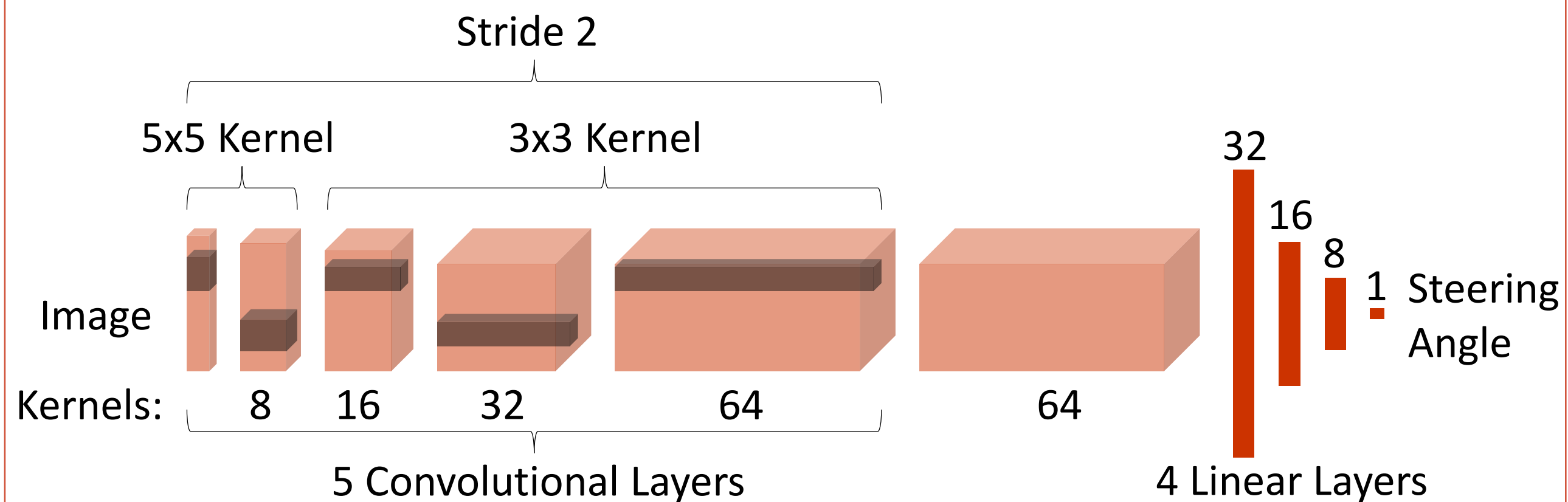

Training track

Test track

[1] https://github.com/udacity/self-driving-car

Processing Pipeline

Steering Angle
• Adjust steering angle.
Left Camera
Center Camera
• Augment.
• Preprocess.
Right Camera
Original Image
Augmented Image
Preprocessed Image
CNN
Pred. Steering Angle
Backpropagate

• Augmentation: random brightness, random flip, random translation
• Preprocess: crop image, convert rgb to yuv, create random shadow, normalize image

Network Architecture

Stride 2

5x5 Kernel   3x3 Kernel

Image

32
16
8
1 Steering Angle

Kernels: 8   16   32   64   64

5 Convolutional Layers

4 Linear Layers

Results

• Overall good performance.
• Drives without problems on training track.
• Drives good on shown test track.
• Outlook: Train car to recover from crashes/off-road