

Assignment 2

Aim :

To do Literature Survey for selected topic.

Objective:

- To gain background knowledge of seminar topic.
- Know what others have found out about the subject and how they have done so.
- To find out various concepts relating to it and the potential relationship between them.

Theory:

Title : Towards Neuroimaging real-time driving using Convolutional Neural Networks

Author : Carlos Fernandez Musoles

Publisher : IEEE

Year : 2016

Convolutional Neural Network (CNN) have been proposed instead of traditional approach. Steer-CNN results have demonstrated that a visual-only driving policy using CNNs is feasible for real-time decision making in the TORCS environment. In addition, this work has laid out several optimization elements that lead to quantitative and qualitative improvements on driving performance and network accuracy. The results presented here show that CNNs are indeed capable of performing well on such spaces and can be trained from example.

Title: Progress in Neural Network-based Vision for Autonomous Robot Driving

Author: Dean A. Pomerleau

Publisher: IEEE

Year: 2002

This paper describes recent improvements to the ALVINN system (Autonomous Land Vehicle In a Neural Network) for neural network based autonomous driving. Faster the network is trained, the less exposure it receives to novel or infrequent scenarios. For instance, during a typical four minute training run, the network sees few if any examples of passing cars. This paper proposes a technique which can be used to train neural networks in short time with more rare conditions, so that vehicle can overcome that situations with no loss.

Title: Vision-based Detection and Classification of Pavement Mark using Neural Network for Autonomous Driving System

Author : Yu-Bin Yoon and Se-Young Oh

Publisher: IEEE

Year: 2011

This paper proposes an algorithm for an autonomous driving system which detects a pavement mark in an image of the road in front of a vehicle and identifies the mark. The algorithm uses edge pairing to find a pavement mark then identifies the type using a neural network which uses the horizontal and vertical projection of the founded mark as input. This paper presents an algorithm which recognizes and classifies a mark on pavement in an image of the road in front of a vehicle.

Title: Moving Towards in Object Recognition with Deep Learning for Autonomous Driving Applications

Authors: Ayüegül Uçar, Yakup Demir, Cüneyt Güzeliü

Publisher: IEEE

Year: 2016

In this paper, author proposed two Convolutions Neural Networks (CNNs) architectures with different layers. Algorithm extract the features obtained from the proposed CNN, CNN in AlexNet architecture, and Bag of visual Words (BOW) approach by using SURF, HOG and k-means. Algorithm uses linear SVM classifiers for training the features. This paper presents a new object recognition and pedestrian detection algorithm. The important steps of this algorithm are to divide into nine patches the image and to extract features relating to each patch. Feature extraction is carried out by using both different CNN architectures and BOW approach.

Title: A Model based Path Planning Algorithm for Self-driving Cars in Dynamic Environment

Authors: Chao cheng Li, Iun Wang, Xiaonian Wang

Publisher: IEEE

Year: 2015

In this paper, we propose a model based path planning algorithm for dynamic environment. The approach generates candidate trajectories online, then evaluates and selects the most appropriate one according to real-time environment information. The selected trajectory can be directly tracked until emergency occurs and replanning starts. In this paper, a model based path planning algorithm for dynamic environment is proposed. The proposed algorithm takes vehicle kinematics into account to guarantee smooth and feasible trajectories.

6 Title: Combination of Fuzzy Logic Control and Back Propagation Neural Networks for the Autonomous Driving Control of Car-Like Mobile Robot Systems

Authors : Tzuu-Hseng S. Li, Chih-Yang Chen, Kai-Chuin Lim

Publisher : IEEE

Year : 2010

This paper designs a sensor-based behavior fusion mechanism for car-like mobile robot to implement the autonomous driving mission. First, a design of collision prevention system is introduced for the car-like mobile robot. Secondly, the wall-following controller composed of a back propagation neural network and a fuzzy logic control is proposed to make the CLMR move smoothly in the unknown and changing environment. In this paper, we have conducted a thorough study, including kinematic control design, simulations, and practical experiments, for the wall-following and the auto-parking control of the CLMR.

Conclusion:

Thus, we have studied different papers related to our topic.