**PROJECT PROPOSAL**

Predict Steering Angles in Self-Driving Cars and System Integration with ROS Nodes

**CT-509 Distributed Systems   
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**Abstract**

In future, the idea of automation will be implemented in innovative ways and grow fast as growing technology this will be more autonomous and furious when we are talking about automobiles. Major implementation is the ability to making the car self-driving and automates by an auto-system.  
This will not only make life easier as well as simpler and safer.

We have a dataset approximately 40GB which contains a set of images with different angles predicted and set by the human or any user of the car by real experience. These data measurement has been compiled by placing the camera behind the car’s windshield and captured the particular images from different angles.

This idea will be very useful and effective in many ways like the sensor for autonomous car will predict each angle in different directions and also its safer like it will not dependent upon driver’s mood.

There are multiple levels of prediction by different technologies like Neural Network Implementation and hybrid models etc.

**Problem Statement**

An autonomous self-driving vehicle is stacked with cameras which captures the screen of different angles in the form of pictures in real-time and also analyze the diversity with the raised time to time by direction and also have the record of steering turnings. In this case we have already a real-time dataset to predict steering angles of an autonomous car.

**Problem Solution**

Our main focus is to predict the different steering angles by given dataset and implement it on a system to be executable to give some output. For this special purpose we will use ROS.

There are some primitive steps to follow for fine line detection and implementation of a system.

* Computer Vision
* Deep Learning
* Sensor Fusion
* Localization
* Path Planning
* Control
* System Integration

We will begin building, implementation and testing our neural network using raspberry-pi, language Python, Tensor Flow etc.

**Project Scope:** This project will be the beneficial asset for people as it will implement in a finest way and reduce so many hurdles like people who cannot drive with any disability or any other reason and transportation will become easier and safer.

**Selected Papers:**

1. Molla, Tesfamichael. (2018). Self-Driving car. 10.13140/RG.2.2.36042.82885.
2. Tian, Yuchi & Pei, Kexin & Jana, Suman & Ray, Baishakhi. (2018). DeepTest: automated testing of deep-neural-network-driven autonomous cars. 303-314. 10.1145/3180155.3180220.
3. Yadav,Neha & MA,Amherst & MA,Amherst.(2017).Predict Steering Angles in Self-Driving Cars
4. Tian, Yuchi & Pei, Kexin & Jana, Suman & Ray, Baishakhi. (2018). DeepTest: automated testing of deep-neural-network-driven autonomous cars. 303-314. 10.1145/3180155.3180220.
5. Du,Shuyang & Guo,Haoli & Simpson,Andrew.(2017).Self-Driving Car Steering Angle Prediction Based on Image Recognition
6. Eraqi, Hesham & Moustafa, Mohamed & Honer, Jens. (2017). End-to-End Deep Learning for Steering Autonomous Vehicles Considering Temporal Dependencies.
7. John, Vijay. (2018). Vision-based Steering Angle Prediction by the Fusion of Depth and Intensity Deep Features.

**WebLinks for initialize the working:**

1. <https://towardsdatascience.com/teaching-cars-to-drive-using-deep-learning-steering-angle-prediction-5773154608f2>
2. <https://towardsdatascience.com/teaching-cars-to-drive-using-deep-learning-steering-angle-prediction-5773154608f2>