

**DEEP LEARNING
CSCI 5931
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PROJECT PROPOSAL

REAL TIME ROAD SIGN DETECTION, RECOGNITION AND DRIVER GUIDANCE SYSTEM

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1. Title :

Real time road sign detection, recognition and driver guidance system.

2. Problem statement :

As the number of cars on the road grows in today's society, so do the number of accidents. These are caused by a variety of factors such as inadequate infrastructure, severe weather conditions, negligence, and so on. One explanation is that individuals do not notice or observe traffic signs. Even though traffic signs are precisely positioned and each one is required for safety, many drivers fail to read them correctly. Furthermore, some drivers have no idea what the majority of the traffic signs signify. To address this issue, we are designing a driver guidance system that can detect, recognise, and describe the discovered symbol.

3. Motivation :

According to a statistic mentioned in a survey conducted among American drivers, where it was found that 25% of the 1060 respondents were unable to identify common road signs and their meanings ([Source](#)) . This highlights the importance of traffic sign recognition and the need for education and awareness among drivers. It is crucial for drivers to have a good understanding of traffic signs, as they provide important information about road conditions and safety regulations. This information is critical for making informed decisions and avoiding accidents on the road. The results of the survey suggest that there is still room for improvement in driver education and awareness, and further efforts may be needed to ensure that all drivers have a solid understanding of traffic signs and their meanings.

4. Related Works :

1. V. Ciuntu and H. Ferdowsi, "[Real-Time Traffic Sign Detection and Classification Using Machine Learning and Optical Character Recognition](#)," 2020 IEEE International Conference on Electro Information Technology (EIT), Chicago, IL, USA, 2020, pp. 480-486, doi: 10.1109/EIT48999.2020.9208309.

Autonomous vehicle development is currently advancing at a rapid pace, with traffic sign detection and classification playing a key role. This paper examines a few different techniques to performing this work in real-time utilizing a portable system. For speed limit signs, the final solution employs a convolutional neural network for detection and classification, as well as a proprietary optical character recognition technique. The training and testing datasets are based on a combination of the Belgian Dataset, the German Dataset, and photos captured while driving in Illinois, USA.

2. Zhu, Y., Yan, W.Q. [Traffic sign recognition based on deep learning](#). *Multimed Tools Appl* **81**, 17779–17791 (2022).

The Intelligent Transportation System (ITS), which includes driverless vehicles, has gradually matured. A critical technical difficulty is how to minimize interference caused by numerous ambient conditions while performing accurate and efficient traffic sign detection and recognition. Traditional visual object recognition, on the other hand, is mostly based on visual feature extraction, such as color and edge, which has limits. Convolutional neural

network (CNN) was created for deep learning-based visual object recognition, and it has successfully overcome the disadvantages of traditional object recognition. In this research, they have conducted an experiment to evaluate the performance of the latest version of YOLOv5 on dataset for Traffic Sign Recognition (TSR), which explains how the deep learning model for visual object recognition works.

5. Method(s) :

Based on our prior experience in computer vision and artificial intelligence courses, we want to use our combined skills to produce software that will use deep learning techniques and datasets from [Kaggle](#). We plan to use the yolov7 (the latest version) to enable this to be responsive in real-time, though this element is still under review as we explore for any better alternatives.

6. Team members :

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Tarun Reddy Nerella : 110573592

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7. Timetable :

According to our individual schedules, we have allocated time on every Tuesday after the deep learning lecture, to meet up at the Auraria Library in order to discuss the progress we've made each week. We plan on presenting our project demo on 04/25/2023, so we have 10 in person meetings at the library.

8. Do you intend to declare this project as your MS degree requirements?

No.