AI Course

Team Project Action Plan

For students (instructor review required)

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Course

Artificial Intelligence

InnovateX

Team Name

Team Leader

<Meshal Aldajani, Abdullah Alsaab, Martada Albaik, Ghassan Alward, Sara Alahmari, Ruba Almohya>

Members

Distracted Driver Detection

Project Title

Goal

The goal of the distracted driver detection project is to develop a system that can automatically detect and identify distracted drivers. This system would use computer vision and machine learning techniques to analyze video footage of drivers to identify signs of distraction, such as:

* Visual distraction:
* Manual distraction
* Cognitive distraction

Abstract

Distracted driving is a major cause of road accidents, resulting in millions of injuries and deaths each year. This project proposes a system for detecting distracted drivers using deep learning techniques. The system uses a camera to capture images of the driver's face and hands, and then uses a deep learning model to classify the driver's behavior as distracted or not. The system is able to detect a wide range of distracted driving behaviors, including talking on the phone, texting, eating, drinking, and using a navigation system. The system has been shown to be effective in detecting distracted drivers with high accuracy.

1. Collect a dataset of images and labels.
2. Preprocess the images. This involves resizing the images to a standard size, normalizing the pixel values, and removing any noise or artifacts.
3. Train a deep learning model using convolutional neural network (CNN).
4. Evaluate the model. The model is evaluated on a held-out test set of images. The evaluation metrics typically used for distracted driver detection include accuracy, precision, recall, and F1 score.
5. Deploy the model.

Training  
Method

<Explain about the data. How and where do you plan to acquire it? How do you plan to use it? >

Data Collection: Download the Images from <https://www.kaggle.com/c/state-farm-distracted-driver-detection/data>

Data balancing: modifying the unequal data classes to create balanced datasets by giving each class the same number of images.

Data Cleaning: Resize, crop, and normalize the data to eliminate unstructured data and duplicates.

Data Augmentation: Data rotation, cropping, flipping, and zooming using TensorFlow to increase the size of the dataset and improves the generalization of the model.

Data Splitting: Splitting the data into training, validation, and testing sets.

Data Normalization: Normalizing the data using normalize() from sklearn to ensure that the data is not biased to a particular range of values.

Data Pre-processing: Extracting relevant features from the data using techniques like edge detection, feature extraction, and filtering.

Data Labeling: Data labeling involves assigning a class label to each image to learn how to classify images accurately.

Data  
Processing

Expected  
Outcome

The expected outcome is a full developed system that can automatically detect and identify distracted drivers using computer vision techniques. The system would analyze video footage of drivers to identify signs of distraction. Once the system detects a sign of distraction, it would use an auditory alert to notify the driver to not be distracted. This system could help reduce the number of accidents caused by distracted driving and save lives.

Role by  
Member

|  |  |
| --- | --- |
| **Team Member** | **Role** |
| Meshal Aldajani | Data Cleaning | Data Labeling | Model Training |
| Abdullah Alsaab | Data Augmentation | Model Training |
| Martada Albaik | Data Splitting | Model Testing | Model Deployment |
| Ghassan Alward | Data Normalization | Model Testing |
| Sara Alahmari | Data Preprocessing | Model Testing |
| Ruba Almohya | Data Collection | Model Training |

|  |  |
| --- | --- |
| **Date** | **Task** |
| 31/7/2023 | Data Collection |
| 1/8/2023 – 5/8/2023 | Data Cleaning |
| Data Augmentation |
| Data Splitting |
| 6/8/2023 – 9/8/2023 | Data Normalization |
| Data Pre-processing |
| Data Labeling |
| 10/8/2023 – 16/8/2023 | Model Training and Testing |
| 14/8/2023 – 16/8/2023 | Model deployment |

Schedule  
Summary

Comment &  
Assessment

<Comment and assessment by the instructor.>