

Car Crash Prediction System

Project Title:

Car Crash Prediction System

Introduction:

This graduation project focuses on the development of a computer vision system designed to predict car crashes or collisions. The primary objective is to leverage a pre-trained VGG16 model to analyze video footage and images of traffic scenarios, ultimately enhancing road safety.

Objectives:

- To create a robust computer vision system for predicting car crashes.
- To fine-tune the pre-trained VGG16 model using transfer learning with additional training data.
- To evaluate the system's performance using accuracy, precision, and F1 score metrics.
- To present the project findings and recommendations for future work.

Scope:

This project will encompass the following areas:

- Data collection and preprocessing of video footage and images.
- Development of the computer vision model using TensorFlow.
- Performance validation utilizing a confusion matrix and other relevant metrics.

The expected deliverables include a fully functional prototype and a presentation detailing the results and findings.

Project Methodology:

The methodology adopted for this project comprises the following phases:

1. **Research and Planning:** Reviewing existing literature on car crash prediction systems and understanding project requirements.
2. **Design and Development:** Adapting the VGG16 model for crash prediction and incorporating additional training data to enhance model accuracy.
3. **Testing and Validation:** Conducting rigorous testing of the model's performance using various metrics to ensure reliability.
4. **Analysis and Reporting:** Analyzing the outcomes and preparing a presentation to communicate the findings.

Technologies and Tools Used:

- **Machine Learning Frameworks:** TensorFlow for model development.
- **Image Processing:** OpenCV for processing video footage and images.

Challenges and Risks:

The project may encounter certain challenges, including:

- Model performance and the risk of add more layers because we can't get more recourses.

Timeline:

The project will be carried out over 3 weeks, broken down into the following key milestones:

- Research and Planning – [1 week]
- Model Development – [10 days]
- Testing and Validation – [2 days]
- Presentation Preparation – [2 days]

Conclusion:

This project aims to provide a comprehensive solution for predicting car crashes using advanced computer vision techniques, leveraging the capabilities of the pre-trained VGG16 model. The successful completion of this project will contribute to improved road safety and establish a foundation for future advancements in intelligent transportation systems.

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