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Ahsanullah University of Science and Technology (AUST)

Department of Computer Science and Engineering

Project Proposal

Course No.: CSE4238

Course Title: Soft Computing Lab

Submitted To- Mr Md. Reasad Zaman Chowdhury &

Mr Mohammad Marufur Rahman

Submitted By-

Hasan Rafsanzani Rahman (190104052)

Md. Habibun Nabi (190204092)

Tasnim Munawar Rafee (190204104)

Md. Symum Hossain (190204105)

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Accident and Damage Detection: Identifying and Categorizing Involved Vehicles

Objective:

Our objective is to obtain a mechanism to identify a vehicle that can be the victim or the responsible for some accident incidents. Here we will apply some model to recognize the vehicle by using **USB (Universal-Scale Object Detection Benchmark)** process targeting the point over the number plate of the vehicle. Besides recognizing we will classify the damage scale and try to find out the percentage of chances to occur casualties or fatalities.

Methodology:

We are proposing a methodology to achieve your objective of identifying vehicles involved in accidents and assessing the severity of the damage and potential for casualties:

Phase 1: Data Collection and Preparation

- Accident Scene Images: Gather a comprehensive dataset of high-resolution images depicting accident scenes, ensuring adequate coverage of various accident types and lighting conditions.

- Vehicle Information: Acquire corresponding vehicle information for each accident scene image, including vehicle make, model, year, and license plate details.

- Image Annotation: Manually annotate the images with bounding boxes around the vehicle number plates to facilitate accurate detection and recognition.

Phase 2: Vehicle Detection and Recognition

- Number Plate Detection: Employ an object detection algorithm, such as **YOLOv5** or **Faster RCNN**, to detect and localize vehicle number plates within the accident scene images.

- Number Plate Recognition: Utilize an optical character recognition **(OCR)** technique, such as Tesseract or **EasyOCR**, to extract the vehicle registration number from the detected number plate regions.
- Vehicle Identification: Cross-reference the extracted registration number with vehicle information databases to identify the vehicle make, model, and year.

Phase 3: Damage Assessment and Casualty Prediction

- Damage Classification: Develop a damage classification model based on visual cues such as vehicle deformation, debris, and airbag deployment to categorize the severity of the damage (e.g., minor, moderate, severe).

- Casualty Prediction: Train a casualty prediction model using historical accident data and extracted damage features to estimate the probability of casualties and fatalities based on the assessed damage severity.

Phase 4: Deployment and Monitoring

- Integration: Integrate the vehicle detection, recognition, damage assessment, and casualty prediction models into a unified system for real-time analysis of accident scenes.

- Deployment: Deploy the system in strategic locations, such as traffic junctions and high-accident zones, to capture accident scenes and provide immediate insights.

- Monitoring: Continuously monitor the system's performance and retrain the models periodically to maintain accuracy and effectiveness in identifying vehicles, assessing damage, and predicting casualties.

Thank You!