Project Initialization and Planning Phase

Date	25 Sep 2024
Team ID	739648
Project Title	GuardianEye:YOLO-Based Smart Helmet Detection System For Enhanced Safety In Real-Time
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

This project proposes a YOLOv5-Based Smart Helmet Detection System to enhance safety by identifying helmet usage in real-time with high precision. Utilizing YOLOv5's advanced object detection capabilities, the system can efficiently monitor workers or motorcyclists to ensure compliance with safety regulations. The solution aims to reduce accidents, improve enforcement, and foster a secure environment in industrial and public spaces.

Project Overview	
Objective	The objective of the YOLO-Based Smart Helmet Detection System using YOLOv5 is to provide real-time, accurate helmet detection to enhance safety in various environments. The system aims to ensure compliance with safety regulations by automatically identifying individuals without helmets. This solution helps reduce accidents and promotes a safer working or commuting environment.

Scope	The scope of the YOLO-Based Smart Helmet Detection System using YOLOv5 includes real-time helmet monitoring for workers and motorcyclists in various environments. It aims to integrate seamlessly with existing surveillance systems, such as CCTV or mobile devices, for automated safety checks. The system will be scalable for large public spaces, industrial sites, and traffic monitoring applications..
Problem Statement	
Description	The YOLO-Based Smart Helmet Detection System using YOLOv5 aims to address the challenge of ensuring helmet compliance in real-time, especially in high-risk environments such as construction sites and traffic. Current manual or outdated methods are inefficient and prone to errors, increasing safety risks. This system provides automated, accurate helmet detection, improving safety standards and minimizing accidents.
Impact	The impact of the YOLO-Based Smart Helmet Detection System using YOLOv5 is significant in enhancing safety by ensuring real-time helmet compliance, reducing the risk of injuries and fatalities. By automating helmet detection, the system improves monitoring efficiency, reduces human error, and ensures stricter adherence to safety regulations. This leads to a safer environment for workers and motorcyclists, promoting overall public health and safety.

Proposed Solution	
Approach	YOLOv5 focuses on leveraging deep learning for real-time helmet detection with high accuracy. By training the YOLOv5 model on a dataset of helmeted and non-helmeted individuals, the system can efficiently detect non-compliance in live video feeds. This automated approach ensures rapid response times and reduces the need for manual monitoring, enhancing overall safety compliance.

Key Features	YOLOv5 include real-time helmet detection with high accuracy and low latency. The system can be easily integrated with existing surveillance infrastructure for continuous monitoring. Additionally, it provides automated alerts for non-compliance, improving safety enforcement and reducing manual intervention.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	GPU specifications, vs code	NVIDIA V100 GPUs
Memory	RAM specifications	16 GB
Storage	Disk space for data, models, and logs	1 TB SSD
Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	Ultralytics , Yolov5s,

Development Environment	IDE, version control	Google colab
Data		
Data	Roboflow, 2GB, Directories	Roboflow dataset 1000 images