Project Planning Phase - I
Technology Stack (Architecture & Stack)
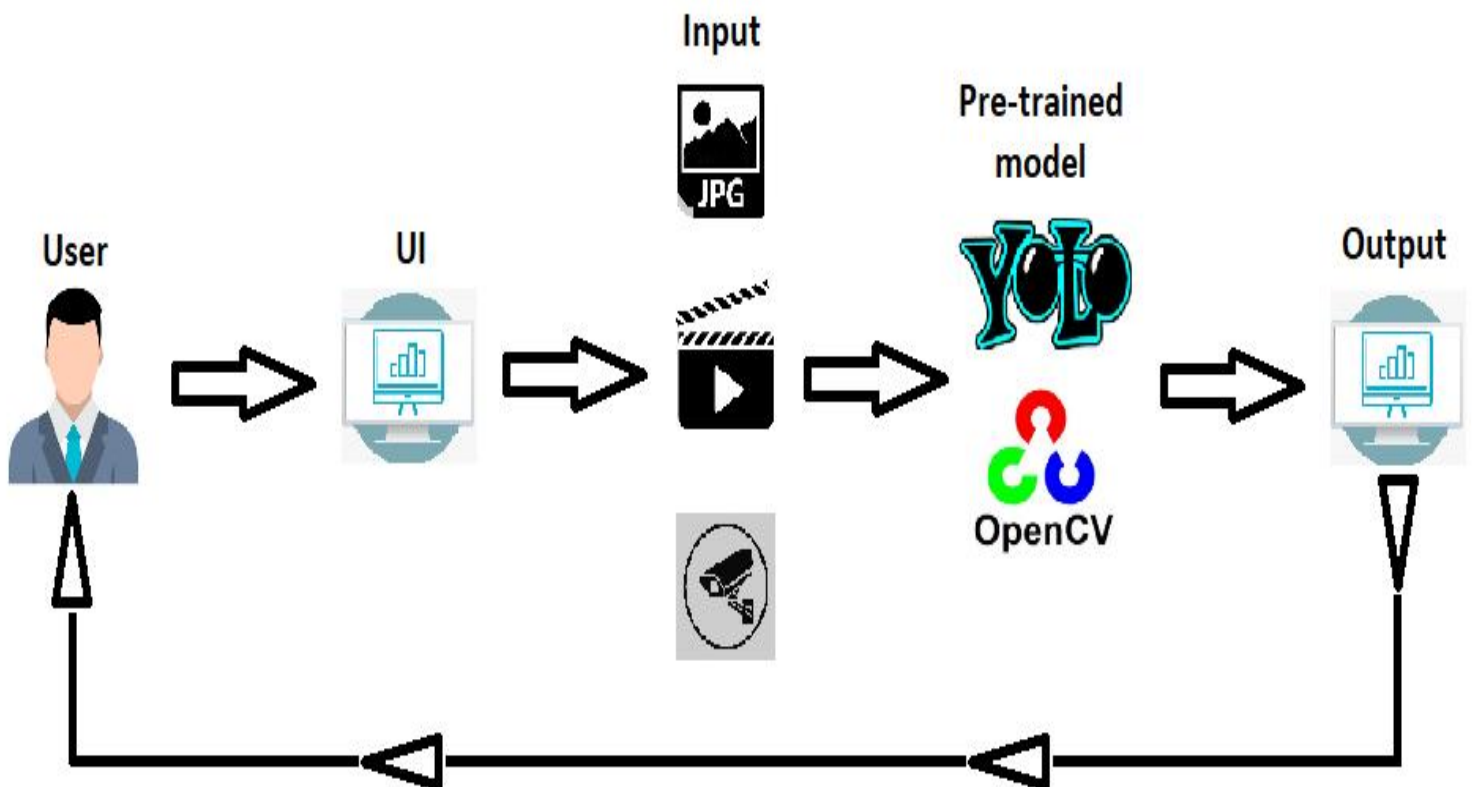
Date: 03rd October 2023
Team ID: Team - 592816
Project Name: Project - Arming Against Violence - Yolo-Based Weapon Detection
Maximum Marks: 4 Marks

Technical Architecture:

1. Application Logic / Technology Block:

Image/Video Upload:

Users upload images or videos through the Flask web app.

YOLOv8 Processing:

The uploaded content is processed using YOLOv8 for firearm detection.

Alert Generation:

Upon detection, the system generates real-time alerts.

User Interface:

The Flask web app provides an intuitive interface for user interaction and feedback.

2. Infrastructural Demarcation (Local/Cloud):

Local Components:

Flask web app hosted on a local server for user interaction.

Cloud Components:

YOLOv8 model hosted on cloud servers for scalable and efficient processing.

3. External Interfaces:

Law Enforcement API:

Integration with law enforcement APIs for automated alert notifications.

User Authentication:

User authentication APIs to ensure secure access to the system.

4. Data Storage Components/Services:

User Data:

User data and preferences stored securely in a cloud-based database.

Alert History:

Recorded firearm detection instances stored for audit and analysis.

5. Interface to Machine Learning Models:

YOLOv8 Integration:

The Flask web app interfaces with the YOLOv8 model for firearm detection, either hosted locally or on the cloud.

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Java / Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier,	Technology used
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Technology used
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Technology used