IT314: Software Engineering
Lab Session II - Course Project Kick-Off
Project: Speed Detection
Group: G3

Collaborators:

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Q1. Functional and Non-functional requirements of the project

Functional requirements

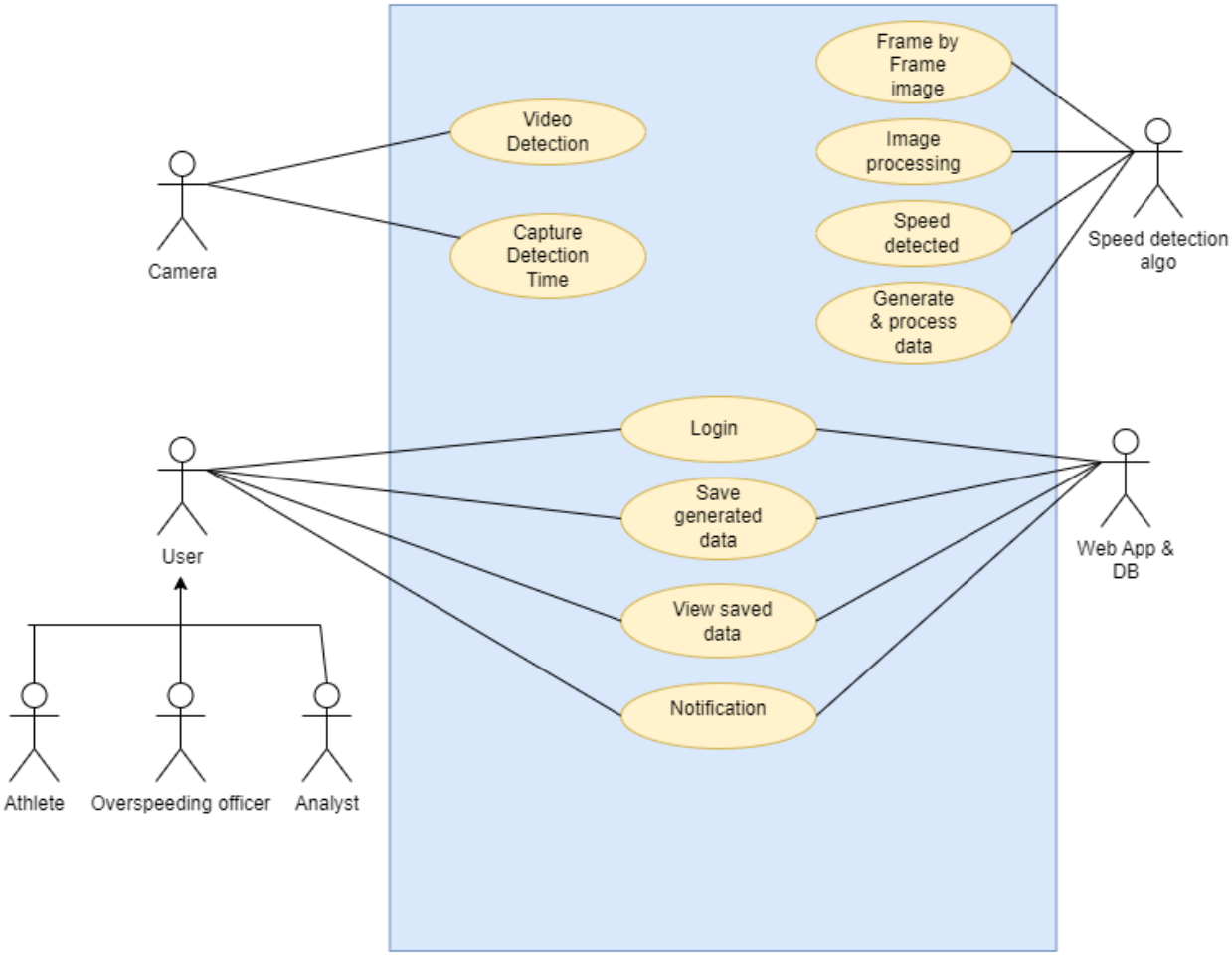
1. Speed calculation: The system should calculate the speed of a vehicle based on the time taken to travel a known distance or frame differentiation algorithm.
2. Camera: The camera will be used to detect the motion of the object.
3. Real time detection: The system should detect and track objects in real-time
4. Image processing: A system should have a software component that processes the images captured by the camera to extract relevant information such as speed
5. Data collection and storage: The system should collect and store information such as vehicle speed, time of detection and other relevant features related to the user, vehicle etc to a database.

6. Multi-detection: The system should be able to detect and handle more than one human/vehicle in the same video stream, and give their individual speeds.
7. Reporting: The system should generate reports such as average speed of the human, vehicle etc and other data on the basis of the data collected.
8. Notifications: The system should generate a pop-up if speed of a vehicle etc exceeds the speed limit.

Non functional requirements

1. Fast processing: The system should process the image and detect the speed in a short time frame.
2. Accurate detection: The system should be able to accurately measure speed even under challenging conditions like low light, bad weather etc.
3. Good quality of the image
4. Usability: The system should be user-friendly and easy to use
5. Scalability: The system should be able to process large amounts of data without much performance issues.
6. Reliability: The system should give consistent results with low rates of error or malfunctions

USE CASE DIAGRAM:



Process model :

Out of all the SDLC available, the models that could be suitable for the development of this project are:

- V-Model
- Incremental Model
- Big Bang Model.

In the V-Model, the steps of the project are planned in parallel. In our project we can build the web application and develop the image processing algorithm in parallel, and verify/validate the algorithm independently on the side.

In the Incremental model, the requirements are divided into groups. In our project we can divide the functional and non-functional requirements into the requirements regarding the web application and the main image processing algorithm. Through this division we can gradually add new and different functionalities to the different groups independently.

The Big Bang Model works best for small projects with smaller team size, and where initially the requirements are unknown. Our project team has 10 members and as the project is relatively small therefore this model is suitable.

Among the above 3 models, the Incremental Model is best suited for our project.