HumanActionRecognition

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Introduction:
Designing a web application to recognize a specific human action. It takes video as input and detects the human action that is being done in the video file. It implements client-server approach that records data using it's preview camera. Code will be designed in an object-oriented approach that utilizes class like ImageAnalysisConfig and ByteBuffer. Some pre-defined human actions will be saved and will be recognized accordingly.

Architecture:
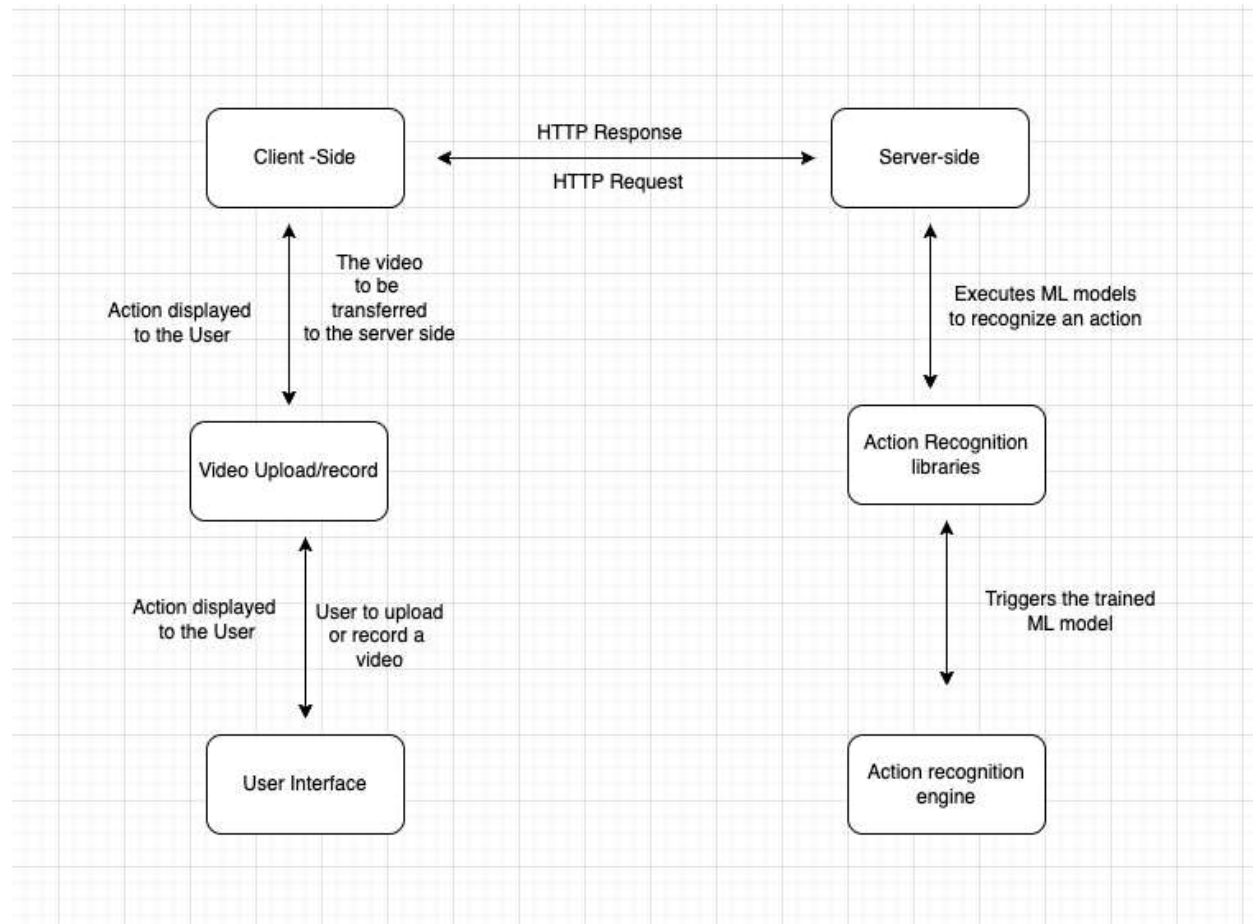
 The client-side is responsible of running the user interface and upload new video files to the server in this architecture. The client-side then preprocesses the video files to reduce their size or resolution in order to speed up the upload process. The server-side is in responsible of receiving

video files, recognizing actions using the trained model, and sending the predictions back to the client-side for display to the user.

The action recognition engine, which is responsible for running the trained model and making predictions on the input video, is one of the server-side components. A database component for storing user data and action recognition results, as well as an API component for handling incoming requests and sending responses back, can be included on the server side.

Flow Chart:
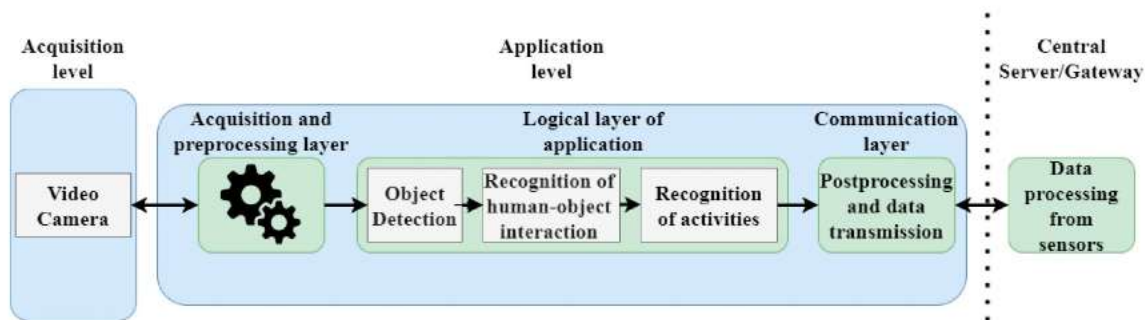
A video will be recorded at data acquisition level and will be pre-processed before performing object detection and thereby recognizing the human action in the video. These actions can also be post-processed before transmitting it to the client-side machine. Videos can also be compressed in order to decrease the memory and latency at the client side so that data can be transmitted effectively.

Iterations:

Iteration 1 (Week 1-2):
- Doing research on various technologies related to implement this project
- Gathering all the requirements and getting it approved by the professor/TAs
- Doing initial phase analysis on human action recognition
- Collecting data pertaining to human actions and splitting it into training/test data
- Setting up the development environment in the respective IDE

Iteration 2 (Week 3-4):
- Integrate the action recognition model into a web application using a framework such as Flask or Django
- Implement a simple user interface that allows users to upload a video and view the predicted action label.

Iteration 3 (Week 5-6):
- Enhance the action recognition model by exploring different architectures and hyperparameters to improve accuracy
- Implement a more robust user interface that includes features such as video playback controls and progress indicators.

Iteration 4 (Week 7-8):
- Implement user authentication using basic authentication methods such as email and password.
- Add a basic dashboard that allows users to view their uploaded videos and prediction history using HTML, CSS, and JavaScript.

Iteration 5 (Week 9-10):
- Host the application on a cloud service such as AWS or any other cloud service provider with a basic configuration.
- Optimize the application for performance by compressing video files before uploading and handling server-side caching of data.
- Implement additional features based on user feedback and testing.