Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	18 October 2022
Team ID	PNT2022TMID23290
Project Name	Project - A Gesture-based Tool for Sterile Browsing of Radiology Images
Maximum Marks	4 Marks

Technical Architecture:

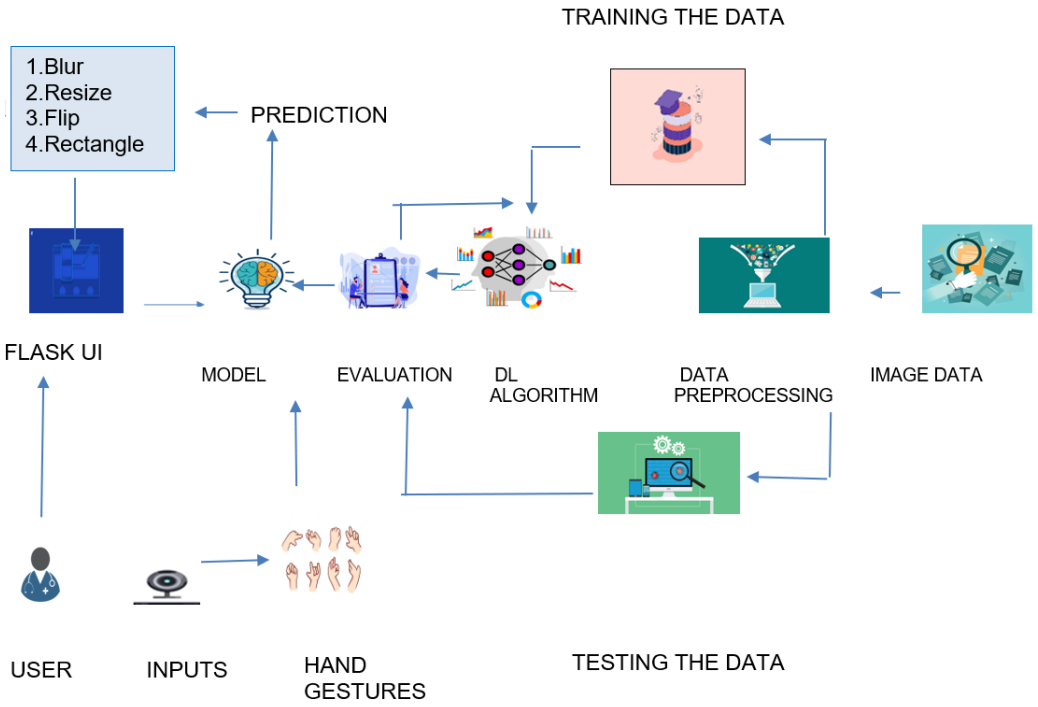

Table-1: Components & Technologies:

S. No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI.	HTML, CSS, JavaScript
2.	Application Logic-1 Frame Pre-processing	Frame is to be pre-processed using Python libraries viz. NumPy, scikit-image, OpenCV	Python
3.	Application Logic-2 Model construction	Deep learning model is to be constructed to classify hand gestures.	IBM Watson studio, Python, TensorFlow, Keras
4.	Application Logic-3 Application Development	Web Application is to be built to take a gesture as input and display the model interface.	Front-End: Html, CSS, JavaScript Back-End: Flask
5.	Cloud Database	Hand images are to be stored on a cloud database for training the machine learning model.	IBM Cloudant DB.
6.	Local File Storage	Local file system stores user input images.	Local file system.
7.	Dataset	Labelled images of hand gestures.	Proprietary dataset provided by IBM
8.	Machine Learning Model	CNN model is to be used to classify pre-processed frames segmented from a video stream.	CNN model using TensorFlow, Keras
9.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration:	Local.

Table-2: Application Characteristics:

S. No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Open-source software to be used for application development, model training and version control.	Languages & Libraries – Python, JavaScript, TensorFlow, Keras Framework - Flask
2.	Robustness	Hand gestures can be captured at different angles and under varied lighting conditions.	Scikit-image, OpenCV

S. No	Characteristics	Description	Technology
3.	Scalable Architecture	The server shall limit the number of user requests to one per second, serve each request on a separate thread.	Python
4.	Availability	The application is to be deployed on a high-performance, reliable server.	IBM Cloud
5.	Performance	Deep Learning model with low inference time.	TensorFlow, Keras

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