

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

Date	20 October 2022
Team ID	PNT2022TMID53360
Project Name	A Gesture-based Tool for Sterile Browsing of Radiology Images
Maximum Marks	4 Marks

Technical Architecture:

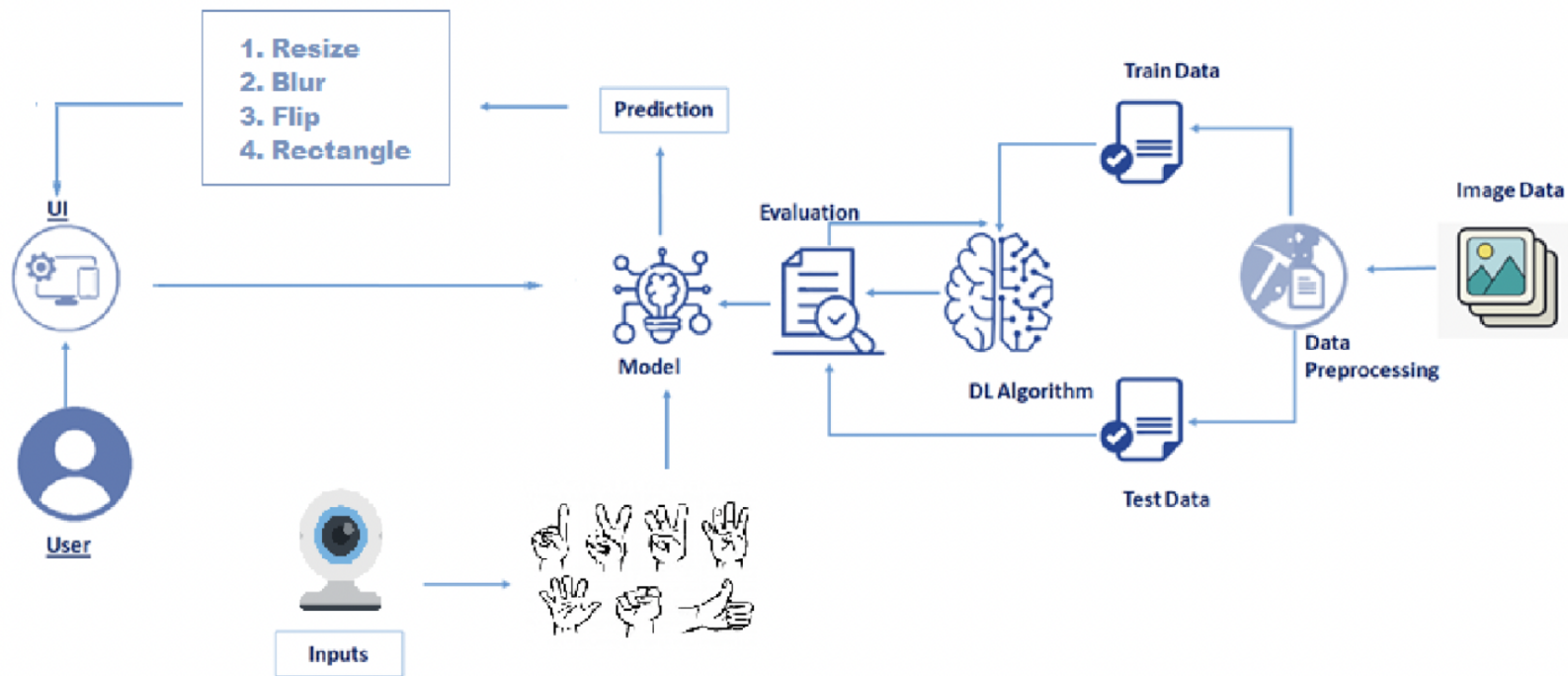


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web UI	HTML, CSS, JavaScript / React Js
2.	Application Logic-1 Frame Preprocessing	Frame is to be preprocessed 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	Python, TensorFlow, Keras, IBM Watson Studio
4.	Application Logic-3 Application Development	Web application to take a gesture as input and display the model inference	Front-End: HTML, CSS, React Js Back-End: Flask
5.	Cloud Database	Hand images are to be stored on a cloud database for training the machine learning model	IBM Cloudant
6.	Local File Storage	Local file system stores user input images	Local file system
7.	Dataset	Labeled images of hand gestures	Proprietary dataset provided by IBM
8.	Machine Learning Model	CNN model is to be used to classify preprocessed frames segmented from a video stream	CNN model using TensorFlow, Keras
9.	Infrastructure (Server / Cloud)	Application is to be deployed on a local server Local Server Configuration: Host name: localhost HTTP port: 3000 SSL(HTTPS) Port: 8443 Connector: 8081 Database: Yes (IBM Cloudant DB) Cloud Server Configuration: in IBM Cloud	Local / Cloud

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Open-source software is to be used for application development, model training and version control	HTML, CSS, JavaScript / React Js, Python, TensorFlow, Keras
2.	Robustness	Hand gestures can be captured at different angles and under varied lighting conditions	Scikit-image, OpenCV
3.	Scalable Architecture	The system 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	Light-weight SOTA deep learning model with low inference time	TensorFlow, Keras