

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

Date	17 October 2022
Project Name	Project - A Gesture-based Tool for Sterile Browsing of Radiology
Maximum Marks	4 Marks

Technical Architecture:

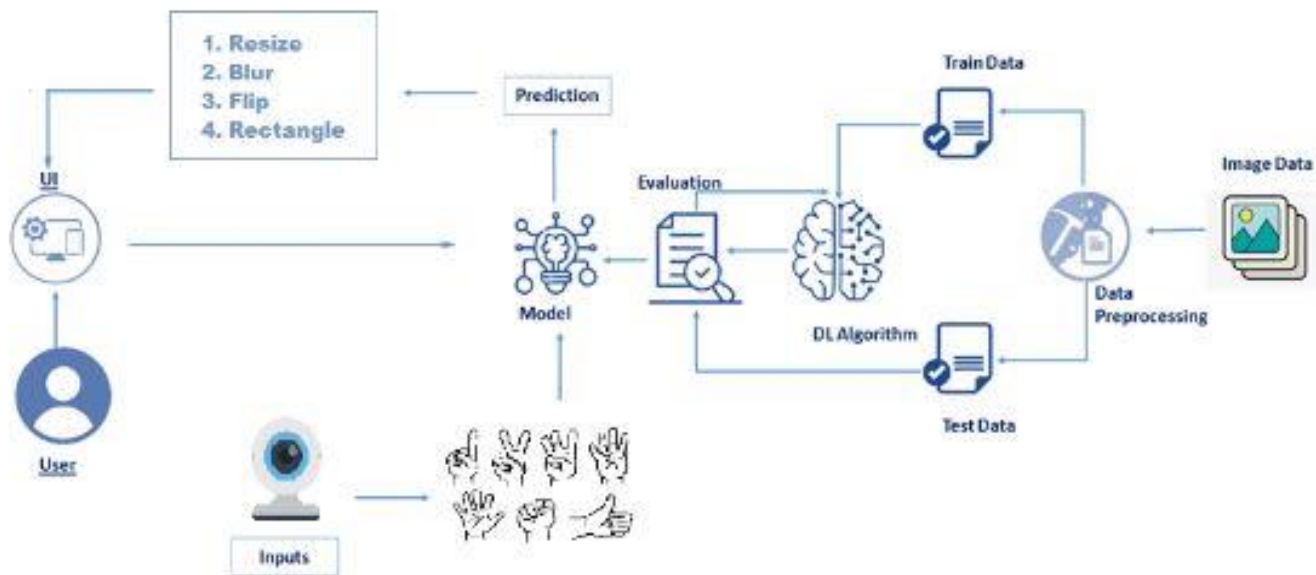


Table-1: Components & Technologies:

S.No	Component	Description	Technology										
1.	User Interface	Web UI	HTML, CSS, JavaScript										
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 is to be built to take a gesture as input and display the model inference	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	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)	<div>Application is to be deployed on a local server Local Server Configuration:<table><tr><td>Host Name</td><td>localhost</td></tr><tr><td>HTTP Port</td><td>3000</td></tr><tr><td>SSL(HTTPS) Port</td><td>8443</td></tr><tr><td>Connector</td><td>8081</td></tr><tr><td>Database</td><td>Yes (IBM Cloudant DB)</td></tr></table> http://localhost:3000/HandGestureWebApp</div>	Host Name	localhost	HTTP Port	3000	SSL(HTTPS) Port	8443	Connector	8081	Database	Yes (IBM Cloudant DB)	Local
Host Name	localhost												
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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	Version Control	GitHub, GitLens
			Editors	Visual Studio Code
			Languages & Libraries	Python, JavaScript, TensorFlow, Keras
			Frameworks	Flask
2.	Robustness	Hand gestures can be captured at different angles and under varied lighting conditions	Scikit-image, OpenCV	
3.	Performance	Light-weight SOTA deep learning model with low inference time	TensorFlow, Keras	
4.	Availability	The application is to be deployed on a high-performance, reliable server	IBM Cloud	
5.	Scalability	The system shall limit the number of user requests to one per second, serve each request on a separate thread	Python	