

Project Design Phase-II

Technology Stack

Date	6 November 2022
Team ID	PNT2022TMID32512
Project Name	Project - Digital Naturalist - AI Enabled tool for Biodiversity Researchers
Maximum Marks	4 Marks

Technical Architecture:

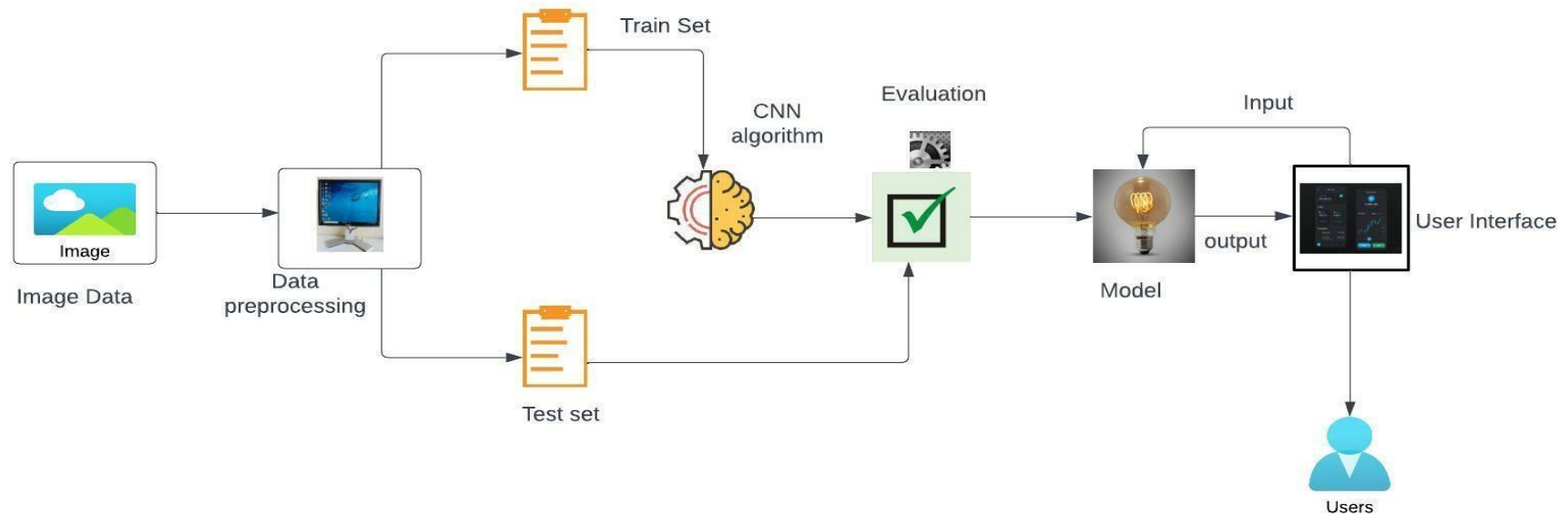


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web UI or Website	HTML, CSS.
2.	Application Logic-1	Image upload	Python Flask.
3.	Application Logic-2	Getting image or text data from user for prediction	IBM Watson STT service
4.	Application Logic-3	Fetch the relevant data from the database and project them to user	IBM Watson Assistant
5.	Database	Image and text data of all the species along with detailed view of each species	NoSQL (MongoDB)
6.	Cloud Database	Fetch data from database and feed them to model for prediction and also used to retrieve the data required for user.	IBM Cloudant
7.	File Storage	Image data, login credentials, code (backend and frontend) and API keys	IBM Block Storage
8.	External API-1	To get data from the database when user give the image input	IBM Storage API
9.	External API-2	To get the username and password of the specific user	Secure Authentication API
10.	Machine Learning Model	To predict the species (flora or fauna) through the image input and also it gives detailed view of the particular species	Species detection and identification model
11.	Infrastructure (Server / Cloud)	Application Delpoyed on cloud server	IBM Cloud

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Opensource frameworks for preprocessing, web application and model training	Keras, Python Flask, TensorFlow, CNN, sklearn and matplotlib
2.	Security Implementations	The security / access controls are implemented using firewalls etc.	Firewall and other security related softwares.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Data , models, operate at size, speed , consistency and complexity
4.	Availability	The availability of application (e.g. use of load balancers, distributed servers etc.)	Image recognition.
5.	Performance	Design aspects for the performance of the application (number of requests per second, use of Cache, use of CDN's) etc.	Full and effective prediction using deep learning for Bio-Diversity researchers