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

Date	17th February 2025
Team ID	PNT2025TMID04206
Project Name	Vision AI
Maximum Marks	4 Marks

Technical Architecture:
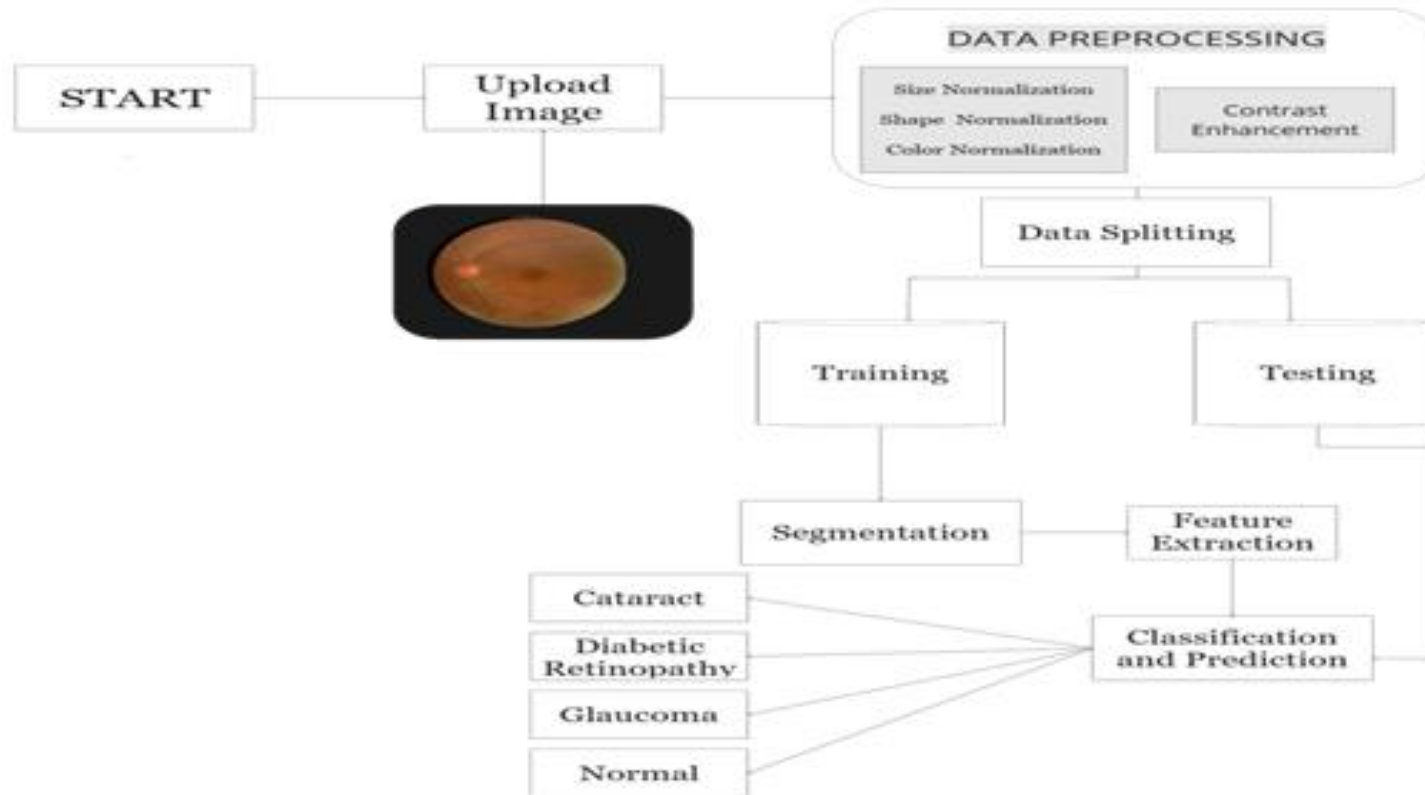
Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web UI for doctors and patients	React.js, HTML, CSS
2.	Application Logic-1	Image preprocessing & segmentation	Python, OpenCV, NumPy
3.	Application Logic-2	Model inference for disease detection	TensorFlow, Keras
4.	Application Logic-3	Patient report generation & insights	Flask, ReportLab, Matplotlib
5.	Database	Stores patient records and images	PostgreSQL, MongoDB
6.	Cloud Database	Cloud-based storage for scalability	Firebase, AWS RDS
7.	File Storage	Stores uploaded medical images	AWS S3, Google Drive API
8.	External API-1	Medical image enhancement	OpenAI DALL-E API
9.	External API-2	Authentication (e.g., Aadhaar API)	AWS Cognito, Aadhaar API
10.	Machine Learning Model	Eye disease classification using CNN	EfficientNetB3, VGG-16
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System and on Cloud	AWS EC2, Docker

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	TensorFlow, React.js, Flask	Open-source libraries
2.	Security Implementations	Data encryption, IAM, Role-based access (RBAC)	AES-256, SHA-256, JWT Auth
3.	Scalable Architecture	Microservices-based deployment	Docker, Kubernetes

S.No	Characteristics	Description	Technology
4.	Availability	Load balancing & failover mechanism	AWS Load Balancer, CloudFront
5.	Performance	Caching, high-performance inference models	Redis, FastAPI

References:

1. Research Papers and Journals Followed by us to develop this project.

https://arxiv.org/abs/1905.11946

https://ieeexplore.ieee.org/document/9999999

2. Datasets used

https://www.kaggle.com/datasets/gunavenkatdoddi/eye-diseases-

3. Pretrained Models & Frameworks

https://www.tensorflow.org/

https://keras.io/api/applications/efficientnet/

https://www.pearson.com/en-us/subject-catalog/p/digital-image-processing-global-edition/P200000003636/9781292223049

4. The Books we have used to develop this model.

- *Deep Learning (by Ian Goodfellow, Yoshua Bengio, Aaron Courville)*

  https://www.deeplearningbook.org/