MINOR PROJECT

- Submitted in partial fulfillment of requirements for the award of degree of Bachelor of Technology
- **Lakshmi Narain College of Technology, Bhopal**

PROJECT TITLE: PLANTOPIA

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- **COURSE:- B.TECH CSE**
- **SEMESTER:- 6th**

Under the guidance of:
Prof. Aditya Patel

PROJECT DESCRIPTION

- Plantopia is a dynamic MERN stack platform offering a wealth of plant-related resources. Through MongoDB, Express.js, React.js, and Node.js technologies, it provides comprehensive plant data, utilizes image recognition for precise species identification, offers chat support for gardening queries, and incorporates a feedback mechanism for user engagement. Plantopia serves as a comprehensive hub for plant enthusiasts, gardeners, and individuals curious about botany. With its user-friendly interface and advanced features, Plantopia empowers users with knowledge and tools to nurture thriving gardens, fostering a deeper connection with nature and promoting sustainable gardening practices for a greener world.

REQUIREMENT

Technology Stack-

1. Front-End: React.js.
2. Back-end: Node.js, MongoDB, QdrantDB.
3. Deep Learning: Python, Pytorch, Transformers.
4. Deployment: Vercel, Hugging Face, Docker.
5. Platform: Web App, Mobile App.

Tools Requirement-

1. IDE: VSCode.
2. UI/UX : Figma
3. GPU: Kaggle GPU/TPU.
4. Version Control: Git, GitHub.

Dataset used

1. Flower Dataset (source)
2. Plant Dataset (source)

WORKING

- Plantopia operates through a seamless integration of technology and botanical expertise.
- Users interact with the platform via a user-friendly interface, accessing a vast database of plant information.
- The image recognition feature allows users to upload plant images for identification, powered by advanced algorithms.
- Additionally, a chat support system provides real-time assistance and gardening advice through AI-driven chatbots.
- User feedback is encouraged, enabling continuous improvement of the platform's content and functionality.
- Behind the scenes, the MERN stack technology ensures robust performance and scalability, while a dedicated team of developers, botanists, and customer support specialists ensures the platform's smooth operation and user satisfaction.

DATA FLOW DIAGRAM

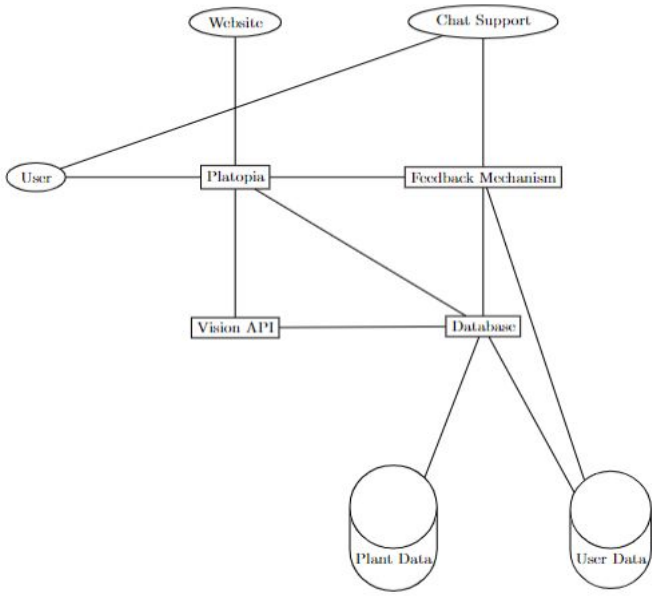
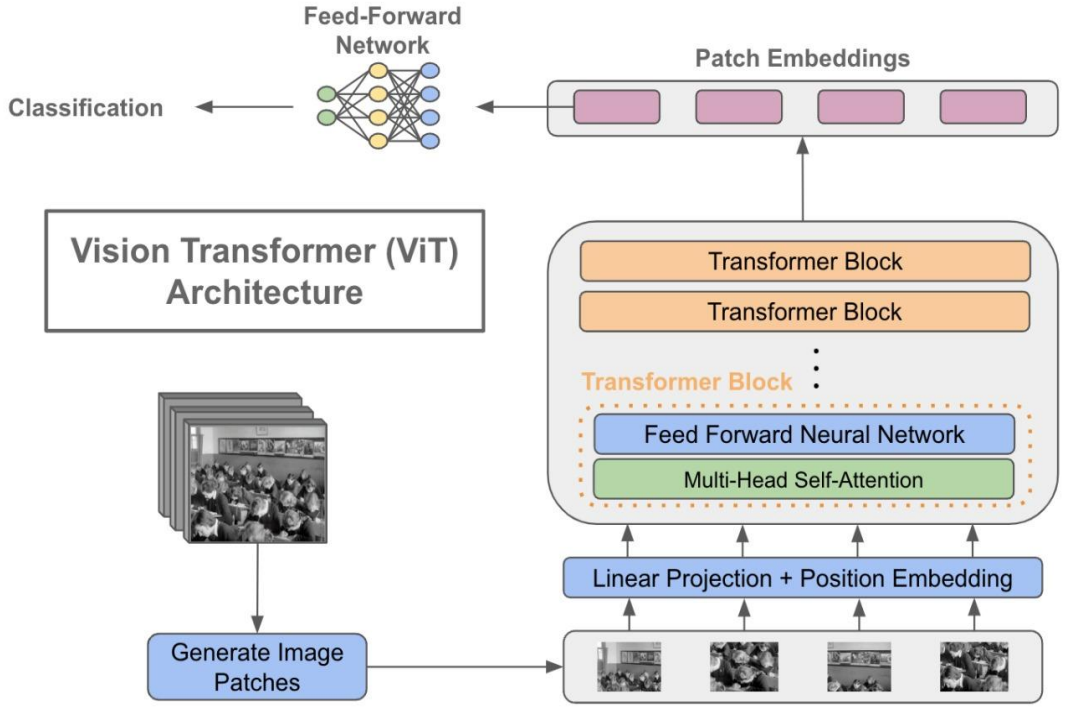
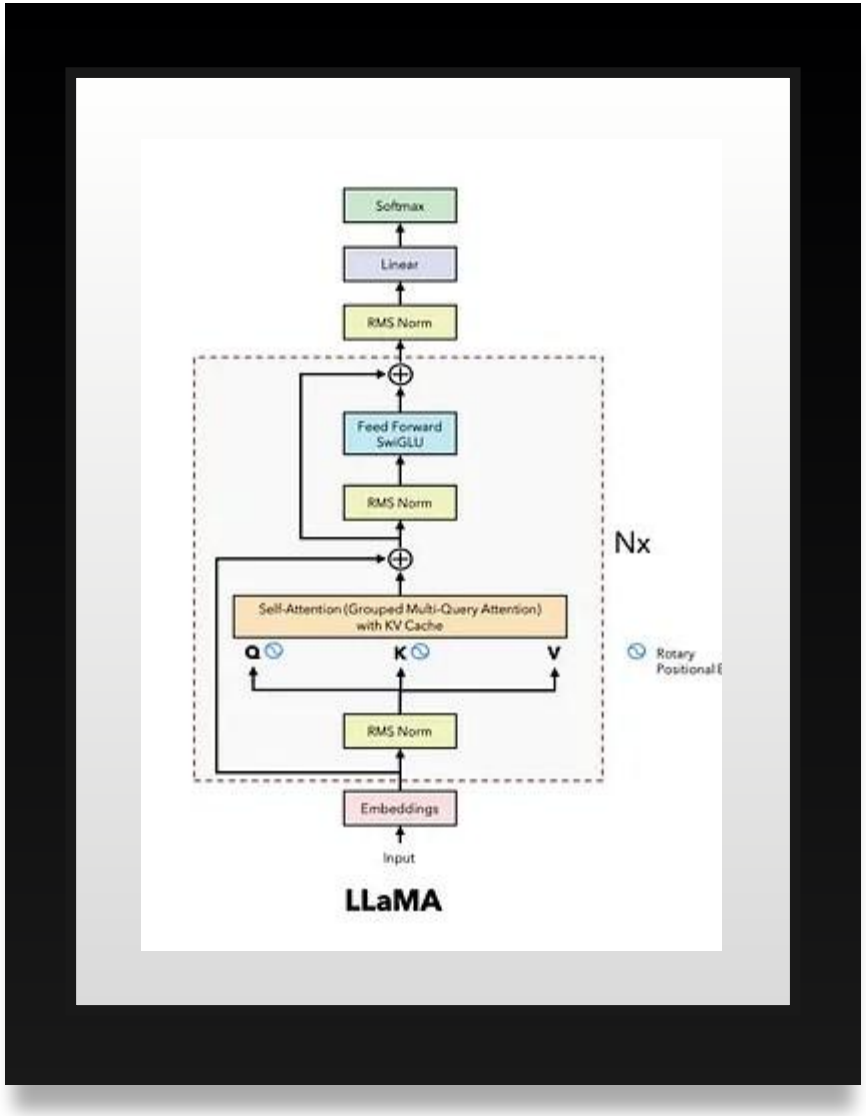


Figure 1: Data Flow Diagram for Plantopia



WORKING OF Deep Learning

Plantopia AI system utilizes Vision Transformer(ViT) which is train using plant/flowers images, first, images are preprocess them, extracts features, trains a model, validates it, and deploys it for user image uploads, ensuring accurate plant species identification, and also give user to asked follow up questions regarding that plant/flower.



IMPLEMENTATION OF Deep Learning

- Pre-process the plant image dataset by resizing and standardizing image formats.Fine-tune a pre-trained vision transformer model on the labeled plant images.Adjust the final classification layer to accommodate the specific plant classes.Evaluate the model's performance on a separate test set and fine-tune as needed for optimal results in plant classification tasks.
- Purpose: TinyLlama is a question-answering chatbot designed to address queries related to plants and flowers, including watering cycles, fertilizers, and trimming techniques.Functionality: It utilizes computer vision to interpret images of plants and flowers, allowing users to ask questions about care routines and receive tailored responses.Features: TinyLlama offers personalized advice on watering schedules, suitable fertilizers, and proper trimming methods based on plant types, enhancing user understanding and care for their botanicals.

PROJECT ABSTRACT

- Plantopia is an innovative platform made with combination of M.E.R.N. stack and Generative AI/Discriminative AI designed to revolutionize the way individuals engage with plants and gardening. Plantopia offers a comprehensive suite of features including a vast plant database, image recognition for species identification, AI-driven chat support for gardening advice, and a user feedback mechanism. Through a user-friendly interface and advanced algorithms, Plantopia empowers users to access valuable plant information, enhance their gardening experience, and foster a deeper connection with nature. With a focus on innovation and user satisfaction, Plantopia strives to cultivate a greener and more informed community of plant enthusiasts worldwide.

THANK YOU