

PLANT DISEASE PREDICTION

- **Objective:** To detect and classify plant diseases using deep learning.
- **Dataset:** A labeled dataset of plant leaf images.
(Kaggle)
- **Technology Used:** Python, PyTorch, Torchvision, OpenCV, and timm library.

APPLICATIONS

1. Agriculture & Farming:

- Helps farmers detect plant diseases early, preventing large-scale crop damage.
- Reduces reliance on manual inspection, making disease identification faster and more accurate.

2. Technology & Automation:

- Can be integrated into mobile apps for real-time disease detection using smartphone cameras.
- Useful for agricultural drones to scan large farmlands and identify affected plants.

MODEL SELECTION

MODEL USED: CONVMIXER (A CONVOLUTIONAL MIXER MODEL).

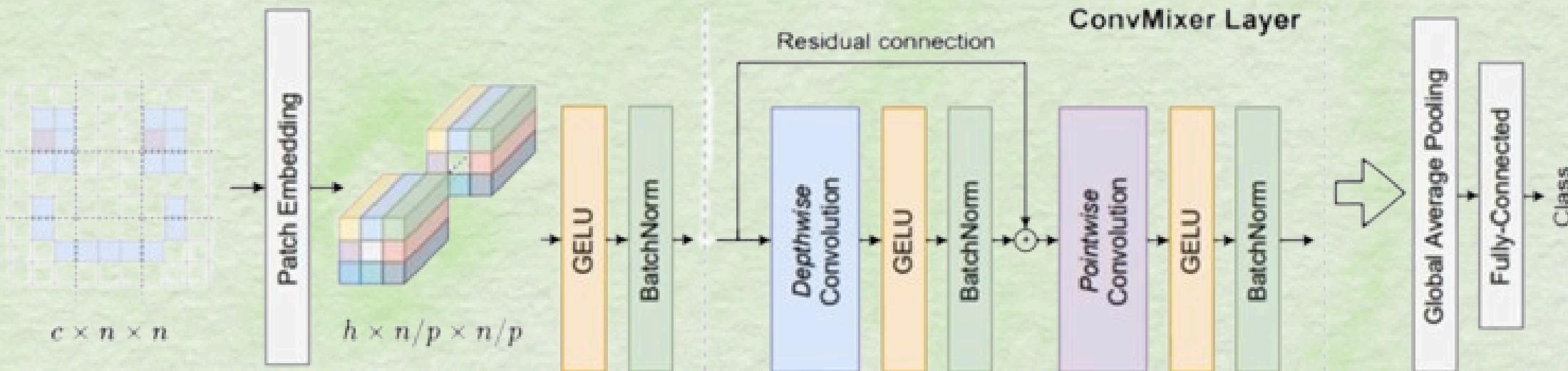
WHY CONVMIXER?

- EFFICIENT FOR IMAGE CLASSIFICATION.
- USES DEPTHWISE CONVOLUTIONS FOR SPATIAL FEATURE EXTRACTION.
- PROVIDES HIGH ACCURACY WITH FEWER PARAMETERS.

TRAINING DETAILS:

- OPTIMIZER: ADAM
- LOSS FUNCTION: CROSS-ENTROPY LOSS
- EVALUATION METRICS: ACCURACY, CONFUSION MATRIX

ConvMixer Architecture



MORE ABOUT THE MODEL

WHAT IS CONVMIXER: A LIGHTWEIGHT CNN COMBINING CONVOLUTIONAL EFFICIENCY WITH TRANSFORMER-LIKE FEATURE EXTRACTION.

HOW IT WORKS: USES PATCH EMBEDDINGS LIKE VISION TRANSFORMERS (VITS) AND DEPTHWISE CONVOLUTIONS TO EFFICIENTLY LEARN SPATIAL PATTERNS.

ARCHITECTURAL ADVANTAGES: COMBINES LOCAL FEATURE EXTRACTION (CNNS) WITH GLOBAL MIXING MECHANISMS, ENHANCING MODEL PERFORMANCE WITHOUT EXCESSIVE COMPLEXITY.

RESULTS: ACHIEVED **HIGH ACCURACY** IN CLASSIFYING PLANT DISEASES. CONFUSION MATRIX SHOWS STRONG PREDICTION PERFORMANCE.

**THANK
YOU**