

Plant Disease Detection Using Vision Transformers (ViT)

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Why is this important?

Plant diseases cause **huge agricultural losses**.
Farmers need **fast & accurate disease detection**.

Data

Dataset: *PlantVillage* (Kaggle)

Data Type: Leaf images (healthy & diseased)

Classes: Multiple plant diseases + healthy leaves

Why this dataset? Helps train AI to automate disease detection for farmers

```
# Load dataset (train & test)
train_dataset = datasets.ImageFolder(root=f"{dataset_path}/train", transform=transform)
test_dataset = datasets.ImageFolder(root=f"{dataset_path}/val", transform=transform)
```

Model Selection

```
# Load ViT model pretrained on ImageNet, modify output for our dataset
model = timm.create_model('vit_base_patch16_224', pretrained=True, num_classes=len(train_dataset.classes))
model = model.to(device) # Move model to GPU if available

# Freeze base layers (only fine-tune classification head)
for param in model.parameters():
    param.requires_grad = False # Keep pretrained layers unchanged

# Unfreeze classification head (fine-tune only this part)
for param in model.head.parameters():
    param.requires_grad = True
```

Training Process

Data Augmentation to improve generalization:

Resize, Flip, Rotate, Color Jitter

Loss function: Cross-Entropy (for multi-class classification)

Optimizer: AdamW (better regularization for deep learning)

Scheduler: CosineAnnealingLR (better learning rate adaptation)

Our competition

- Our product is priced below that of other companies on the market
- Design is simple and easy to use, compared to the complex designs of the competitors
- Affordability is the main draw for our consumers to our product
- Company A product is more expensive
- Companies B & C product is expensive and inconvenient to use
- Companies D & E product is affordable, but inconvenient to use

Product overview

- Unique
- First to market
- Tested
- Authentic
- Only product specifically dedicated to this niche market
- First beautifully designed product that's both stylish and functional
- Conducted testing with college students in the area
- Designed with the help and input of experts in the field

Growth strategy



- **Feb 20XX:** roll out product to high profile or top-level participants to help establish the product
- **May 20XX:** release the product to the public and monitor press release and social media accounts
- **Oct 20XX:** gather feedback and adjust product design as necessary

Thank you

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