Model Optimization and Tuning Phase Template

Date	13 November 2024
Team ID	team-739757
Project Title	Tomato Plant Disease Detection From Leaf Images using Deep Learning
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining neural network models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
ResNet15V2	ResNet15v2 is an optimized model for tomato plant disease detection due to its balance between depth and computational efficiency, making it suitable for tasks with limited data. Its residual learning approach enhances feature extraction and gradient flow, enabling the model to capture subtle disease patterns in leaf images. The pre-activation architecture (v2) improves training stability and accuracy, helping it converge faster on agricultural datasets. Its lightweight nature ensures faster inference and makes it ideal for deployment on mobile or edge devices for real-time disease detection. Additionally, using a pretrained ResNet15v2 allows for effective transfer learning, reducing training time while achieving high classification accuracy.