LIST OF FIGURES

2.1	General Architecture of a Convolutional Neural Network	
	(CNN). A schematic diagram illustrating the hierarchical flow of	
	data through the main components of a CNN, including convolu-	
	tion, activation, pooling, flattening, and fully connected layers	9
2.2	Transfer Learning Strategies: Feature extraction (left) versus	
	fine-tuning (right). In feature extraction, all base layers remain	
	frozen with only the custom classification layer being trained. In	
	fine-tuning, upper layers are unfrozen and retrained along with the	
	custom layer on the target dataset, typically requiring more training	
	data than feature extraction	17
3.1	Research workflow for lemongrass leaf classification using	
	CNN-based transfer learning and fine-tuning	23
3.2	Representative image samples for each class in the lemongrass leaf	
	dataset	27
3.3	Hierarchical structure of lemongrass dataset classes and subclasses .	27
3.4	Folder structure and image count after dataset splitting	29
3.5	Examples of augmented lemongrass leaf images showing various	
	transformations: rotation, zoom, shift, and horizontal flip	31
4.1	Training and validation accuracy/loss of InceptionV3 across 40	
	epochs. Fine-tuning begins at epoch 21	41
4.2	Confusion matrix for InceptionV3 predictions on the test dataset	42
4.3	ROC curves and AUC scores for the fine-tuned InceptionV3 model.	43
4.4	Training and validation accuracy/loss of Xception across 40 epochs.	
	Fine-tuning begins at epoch 20	46
4.5	Confusion matrix for Xception predictions on the test dataset	47
4.6	Training and validation accuracy/loss of MobileNetV2 over 40	
	epochs. Fine-tuning begins at epoch 21	50
4.7	Confusion matrix for MobileNetV2 predictions on the test dataset	51
4.8	ROC curves and AUC scores for the fine-tuned MobileNetV2 model.	52
4.9	Training and validation accuracy/loss of ResNet152V2 over 40	
	epochs. Fine-tuning begins at epoch 21	55

4.10	Confusion matrix for ResNet152V2 predictions on the test dataset	56
4.11	ROC curves and AUC scores for the fine-tuned ResNet152V2 model.	57
4.12	Training and validation accuracy/loss of DenseNet201 across 40	
	epochs. Fine-tuning begins at epoch 21	60
4.13	Confusion matrix for DenseNet201 predictions on the test dataset	61
4.14	ROC curves and AUC scores for the fine-tuned DenseNet201 model.	62
4.15	Confusion matrices of all models on the test dataset after fine-tuning.	67