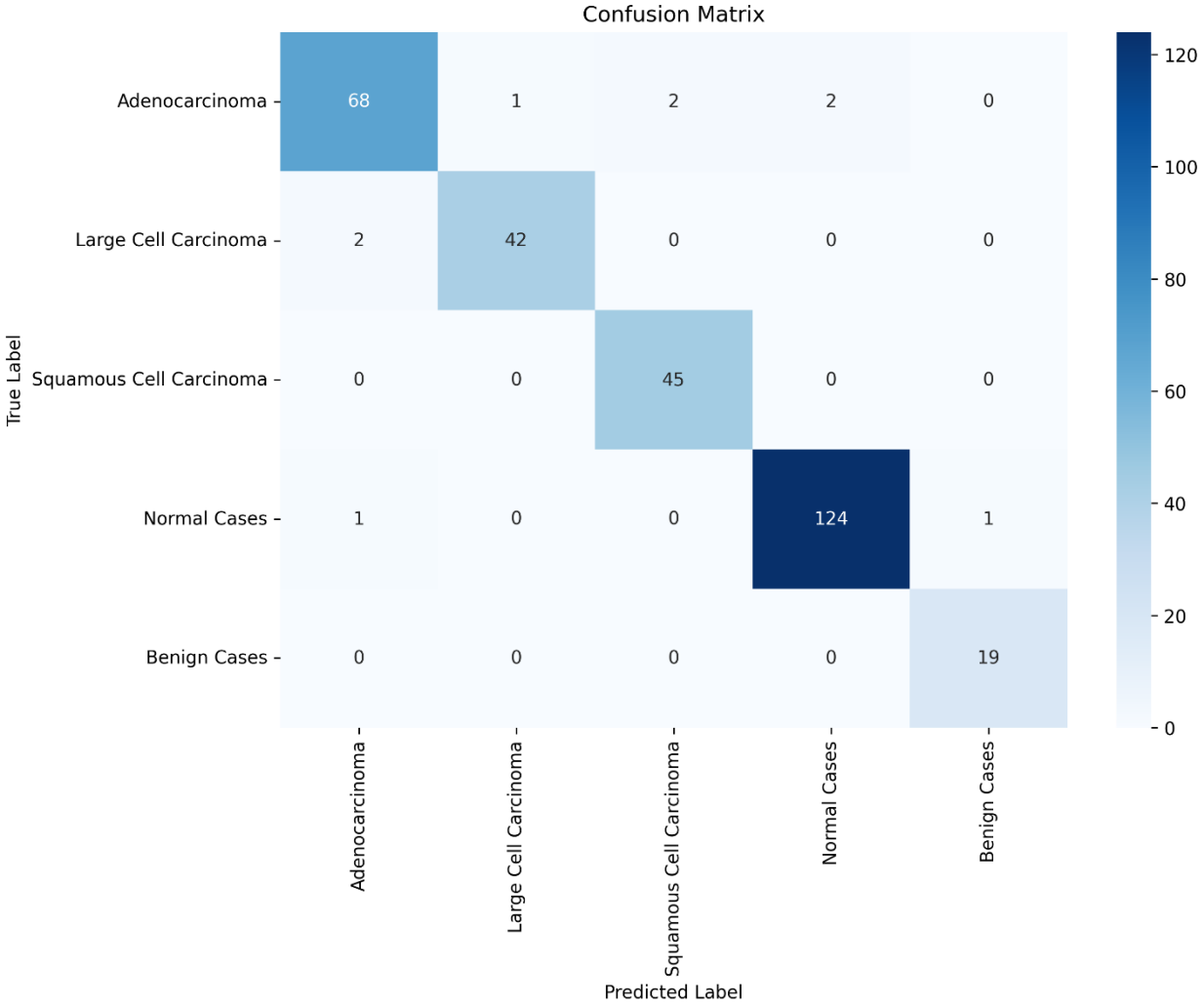
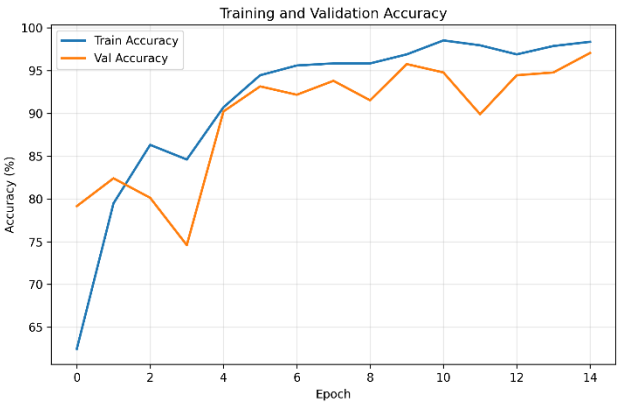
Lung Cancer CT Scan Classification - Analysis Report





Introduction

This project implements a deep learning classifier to detect and classify lung cancer types from CT scan images. The model identifies five categories: Adenocarcinoma, Large Cell Carcinoma, Squamous Cell Carcinoma, Normal Cases, and Benign Cases.

Dataset: 1,535 CT scan images from Kaggle

- Adenocarcinoma: 337 images
- Large Cell Carcinoma: 187 images
- Squamous Cell Carcinoma: 260 images
- Normal Cases: 631 images
- Benign Cases: 120 images

Methodology

Model Architecture

- Backbone: ResNet18 with transfer learning
- Input Size: 128x128 RGB images
-Classifier: Custom layers with dropout
- Output: 5 classes (softmax)

Training Configuration

- Epochs: 15
- Batch Size: 16
- Optimizer: Adam (lr=0.001)
- Loss: Cross Entropy
- Split: 80% training, 20% validation

Results

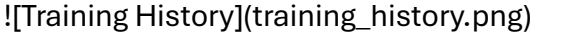
Performance Metrics

- Final Validation Accuracy: 97.07%
- Final Training Accuracy: 98.21%
- Macro F1-Score: 99.03%

Confusion Matrix Analysis

The model shows excellent performance across all classes with minimal misclassifications. Most confusions occur between Normal and Benign cases.

Training Progress



The training shows stable convergence with both training and validation accuracy improving consistently. No significant overfitting observed.