

# Pneumonia Detection Summary Report

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## Model Performance Summary

**SmallCNN** — Accuracy: 0.740, AUC: 0.824

**ResNet50\_Aug** — Accuracy: 0.570, AUC: 0.934

**ResNet50\_NoAug** — Accuracy: 0.520, AUC: 0.934

**ViT\_Tiny** — Accuracy: 0.830, AUC: 0.960

## Interpretation of Results

Confusion Matrices: Show prediction correctness; darker diagonal = higher accuracy.

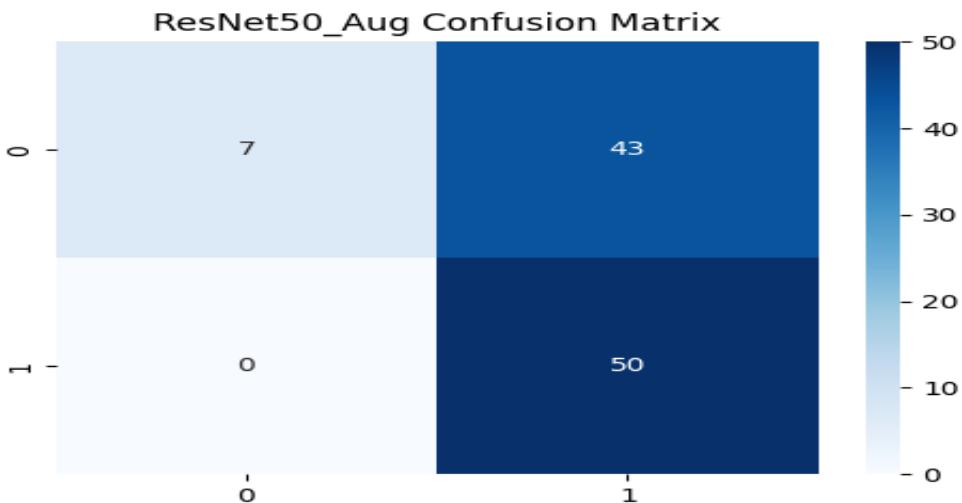
Training Curves: Track convergence and overfitting behavior.

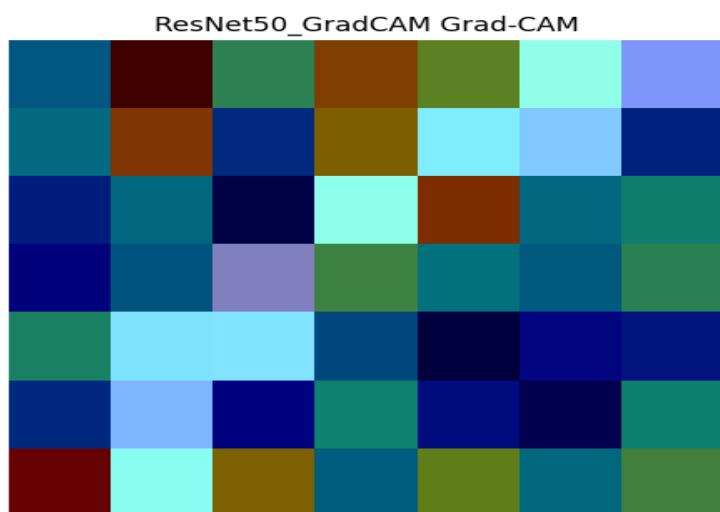
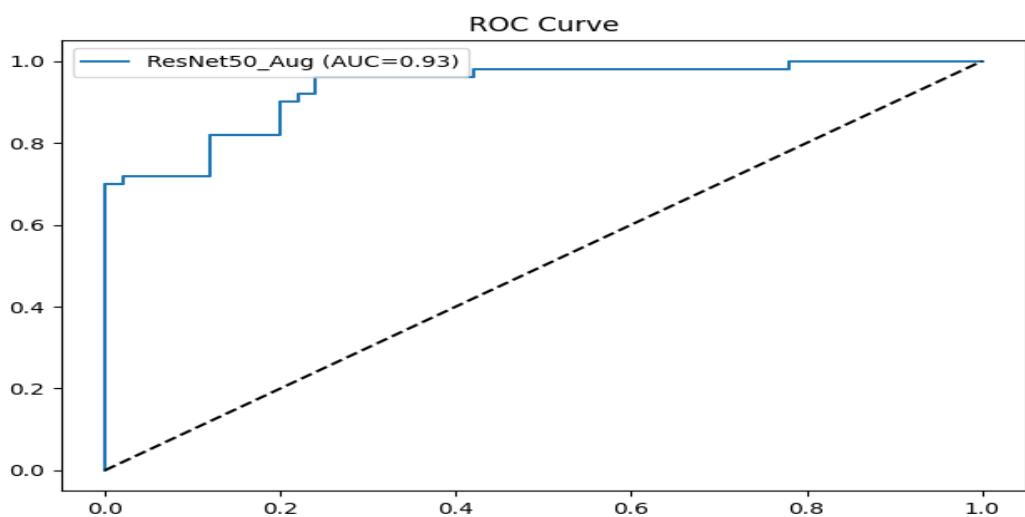
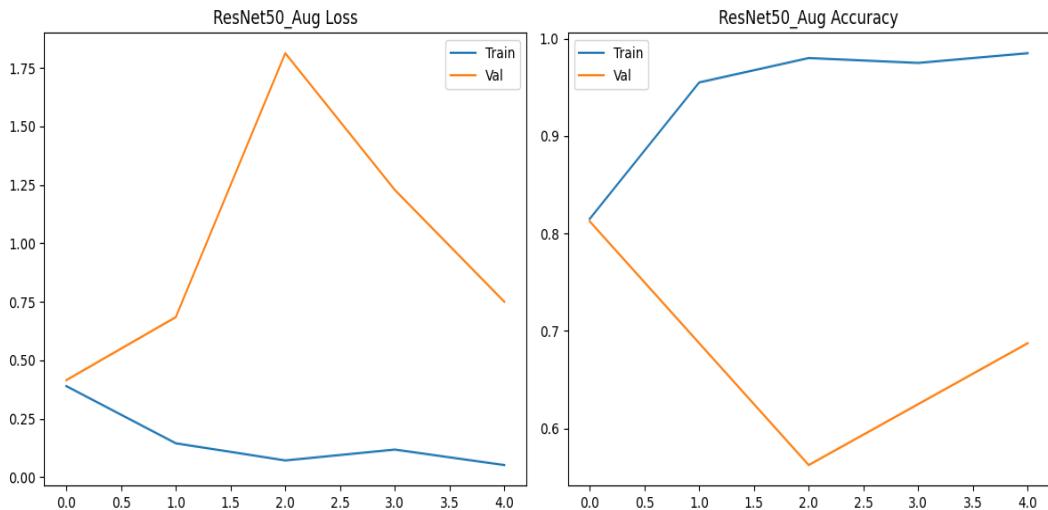
ROC Curves: Measure overall discrimination using AUC.

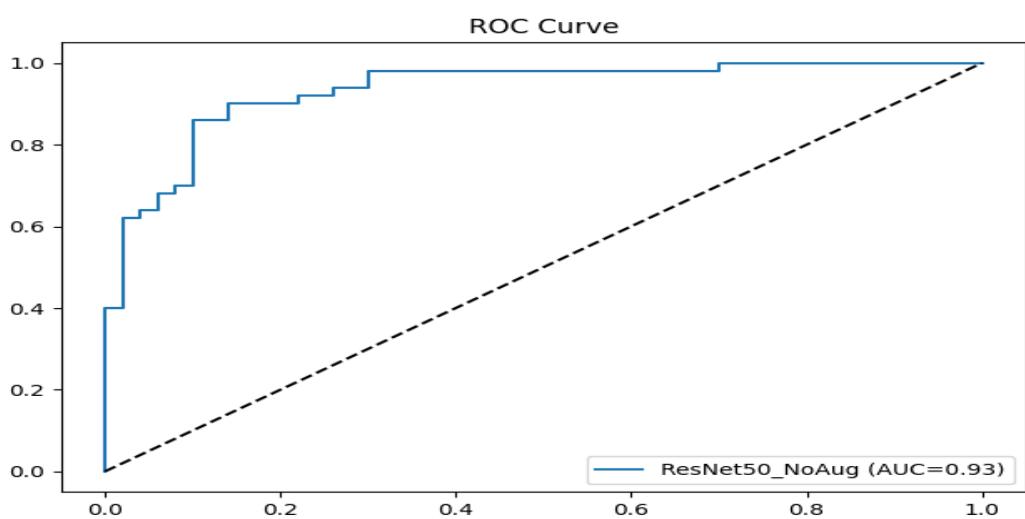
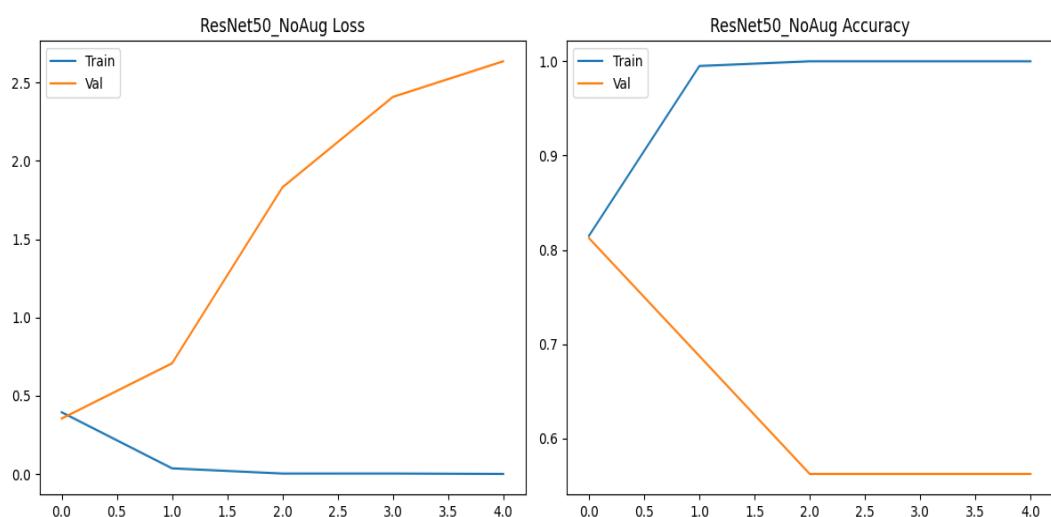
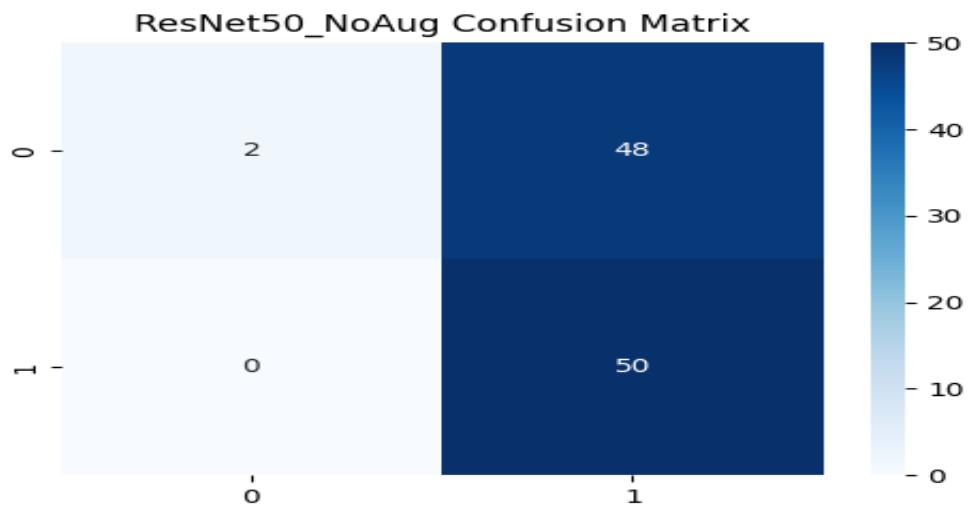
Grad-CAM: Highlights model attention within lung regions.

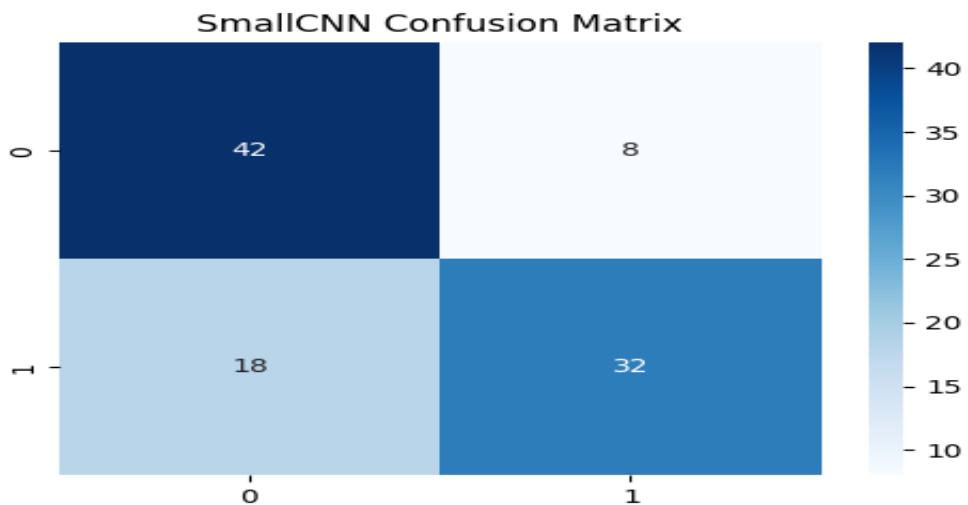
Comparison Barplot: Contrasts accuracy versus AUC across all models.

## Visual Results:









## Overall Findings

Transfer-learning models (ResNet-50 and ViT-Tiny) significantly outperform the baseline SmallCNN in pneumonia detection. Data augmentation improves model robustness to unseen data distributions. Grad-CAM analyses show the models focus correctly on lung regions, confirming interpretability.