Additional Image-Based Classification Using CNN

Image Descriptions:

Precision-Recall Curve: This graph plots recall against precision, offering a visual representation of the trade-off between these two metrics. It serves as a vital tool for understanding how effectively the model balances precision and recall to enhance classification accuracy.

ROC Curve: The ROC curve illustrates the relationship between the false positive rate and the true positive rate, providing a comprehensive view of the model's performance across a range of threshold values. The area under the curve (AUC) offers a singular metric to gauge the overall effectiveness of the model.

Confusion Matrix: Presented as a heatmap, the confusion matrix provides a detailed breakdown of the counts of true positives, true negatives, false positives, and false negatives. It offers invaluable insights into the model's classification accuracy and the distribution of prediction errors.

Training and Validation Loss: This line plot tracks the loss values for both the training and validation sets over each epoch. By monitoring the progression of loss values, it enables the detection of overfitting or underfitting tendencies and guides optimization efforts.

Training and Validation Accuracy: Depicted through a line plot, this metric showcases the accuracy of the model on both the training and

validation sets throughout each epoch. It provides a clear understanding of the model's performance dynamics, highlighting any potential gaps between training and validation accuracies that could indicate overfitting.

By seamlessly integrating these two methodologies—traditional machine learning for cellular data and CNNs for image-based classification—our project presents a robust toolkit for accurately diagnosing breast cancer, underscoring the versatility and effectiveness of diverse algorithms and methodologies.
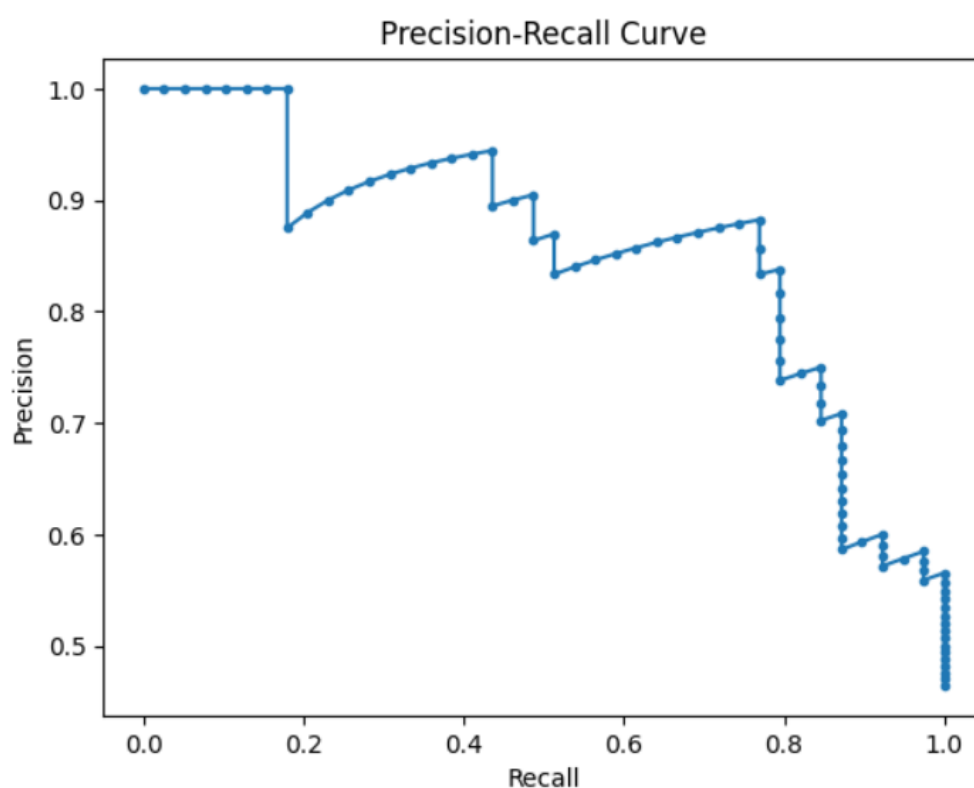

Fig 7.1 Precision-Recall Curve
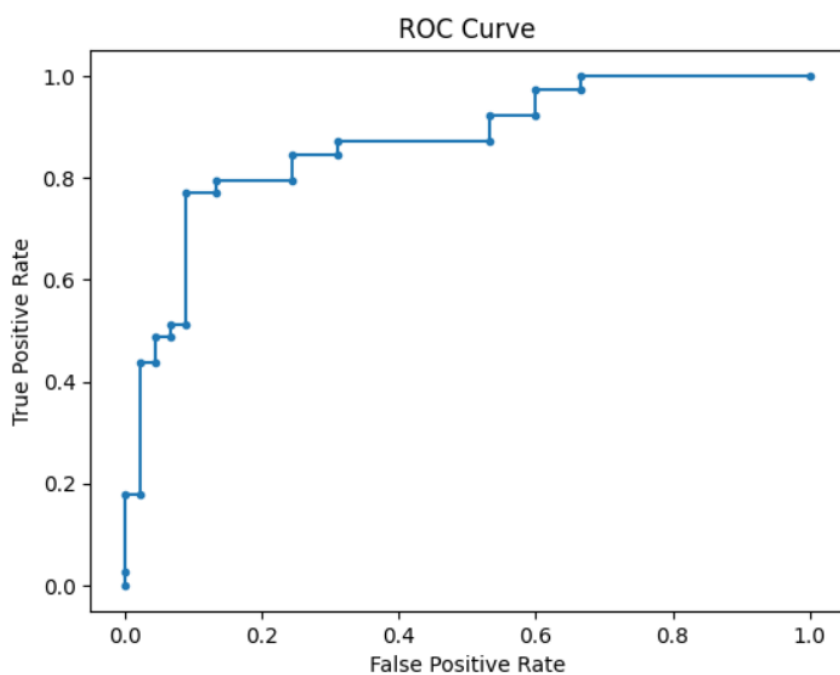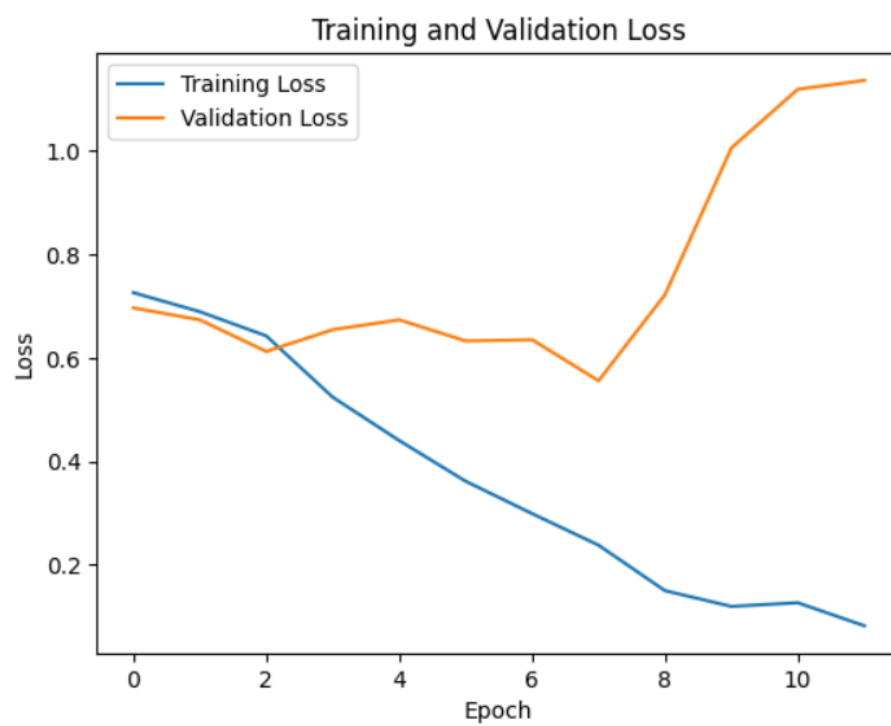
Fig 7.2 ROC Curve
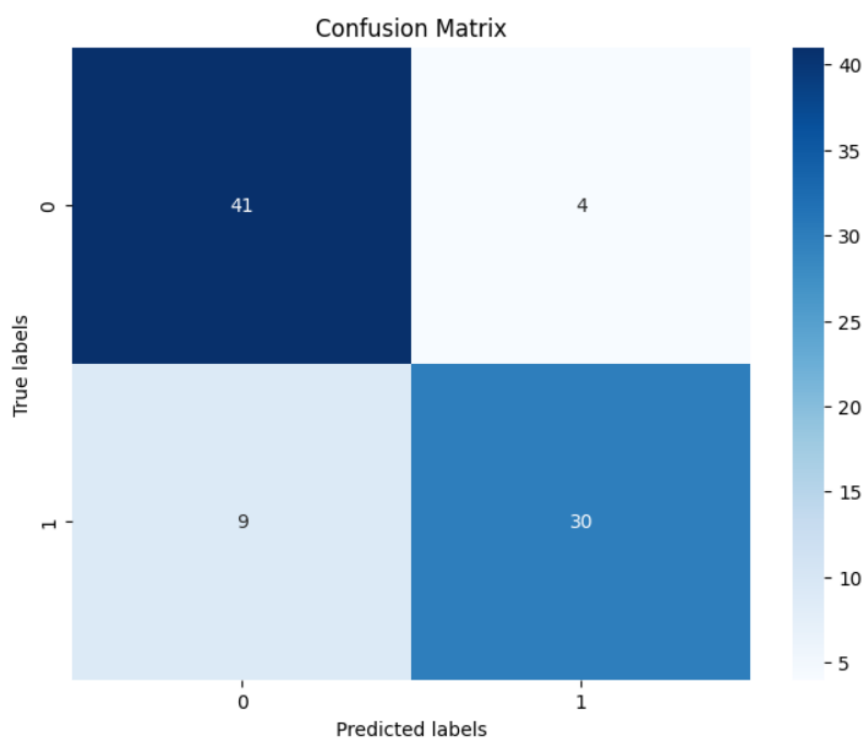
Fig 7.3 Confusion Matrix

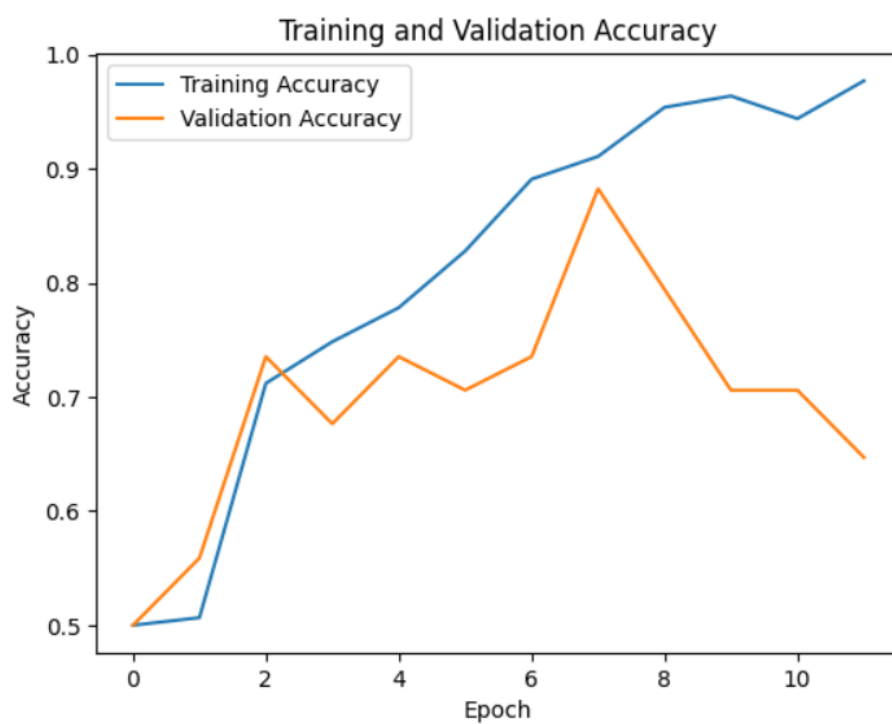Fig 7.4 Training and validation loss

Fig 7.5 Training and validation loss

PREDICTION USING TEST IMAGES:
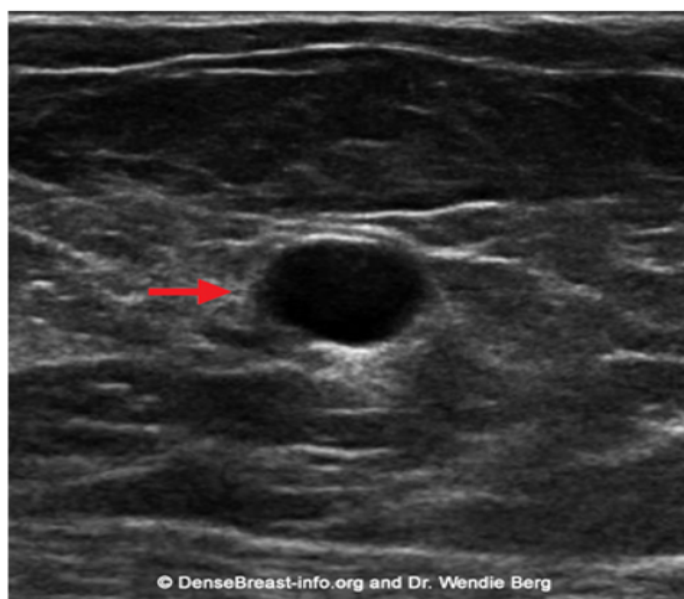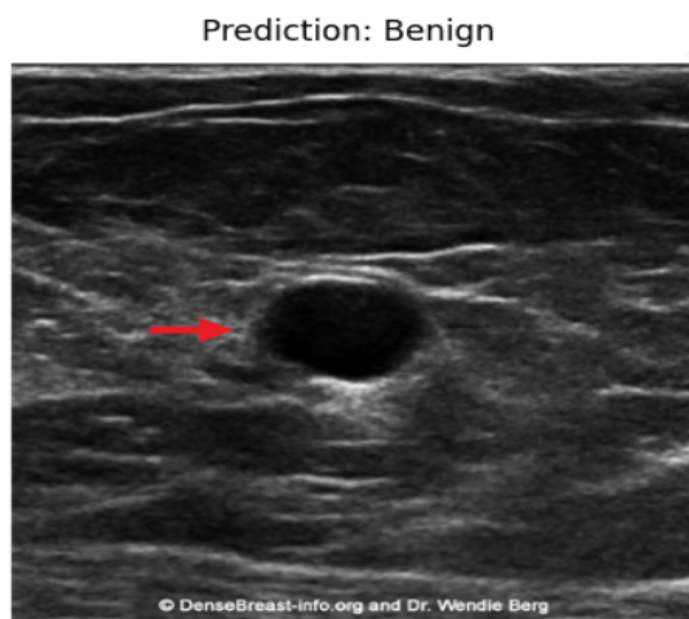
Sample 1 :

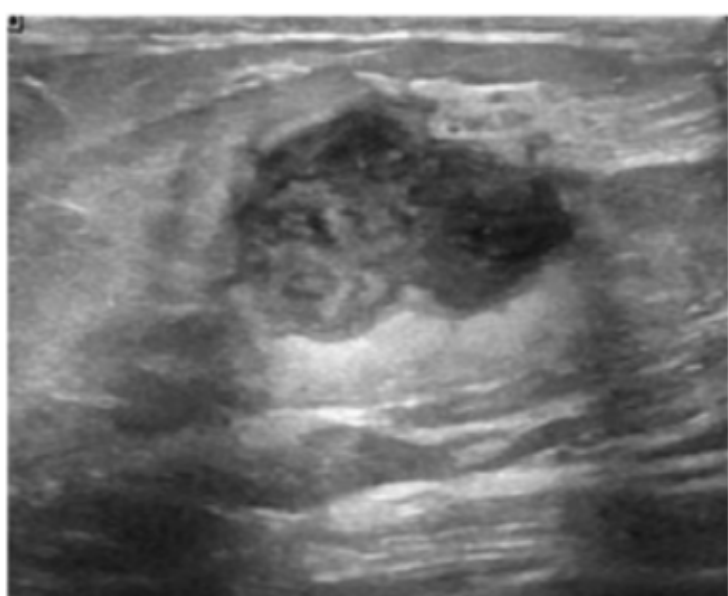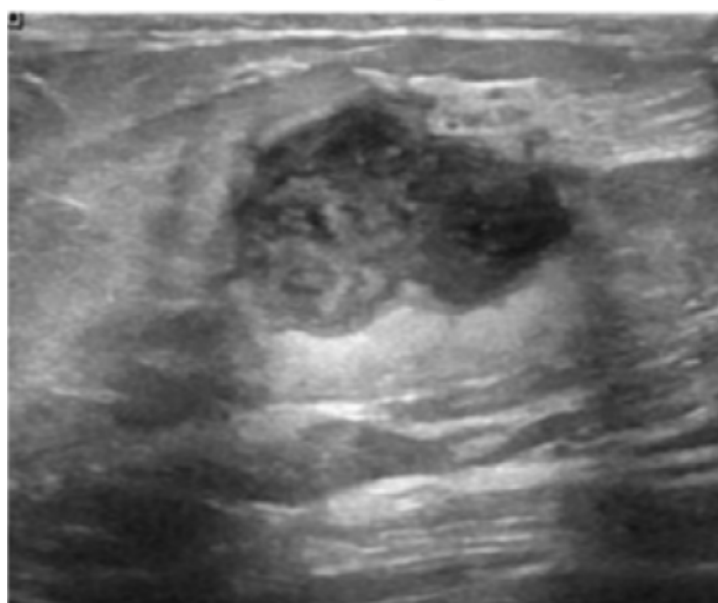Fig 7.6 Input Image

Fig 7.7 Predicted Output Image

Sample 2:

Fig 7.8 Input Image

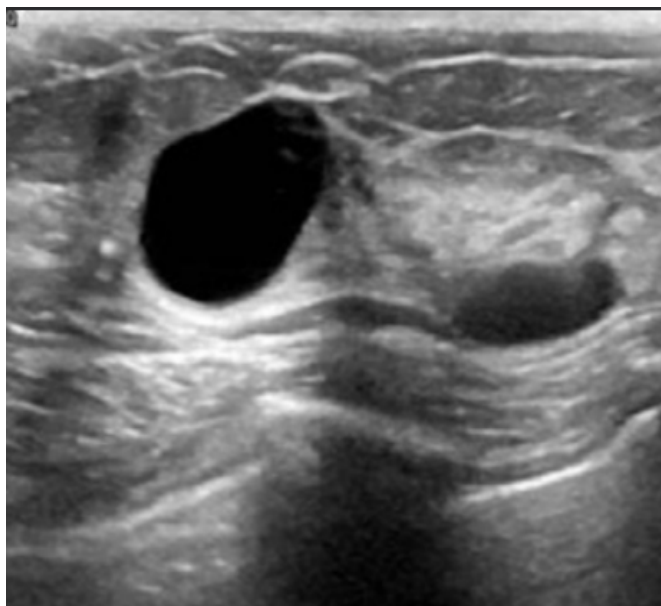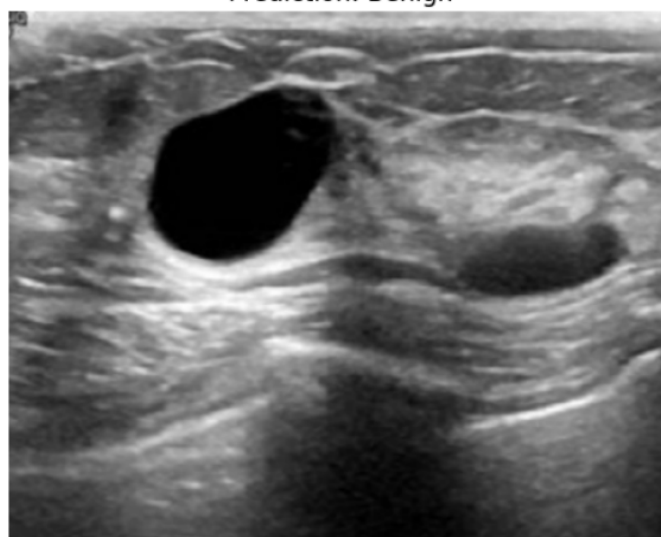Prediction: Malignant

Fig 7.9 Predicted Output Image

Sample 3:

Fig 7.10 Input Image

Fig 7.11 Predicted Output Image