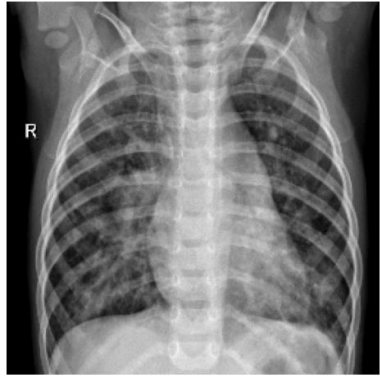


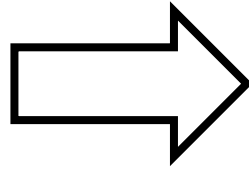
CS725 Project

- Pneumonia Classification using SVM
- All hyperparameter tuning results are included in this document

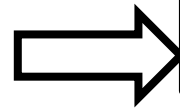
SVM Model



256 x 256 x 1



Flatten (65536)



SVM

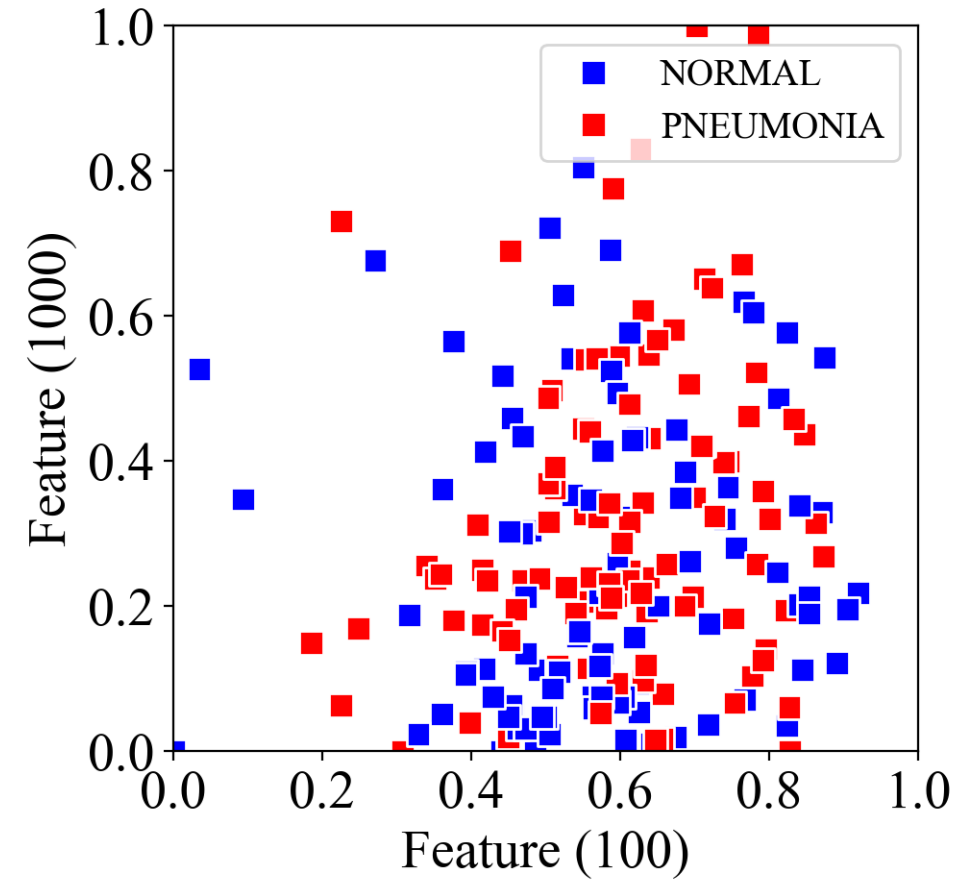
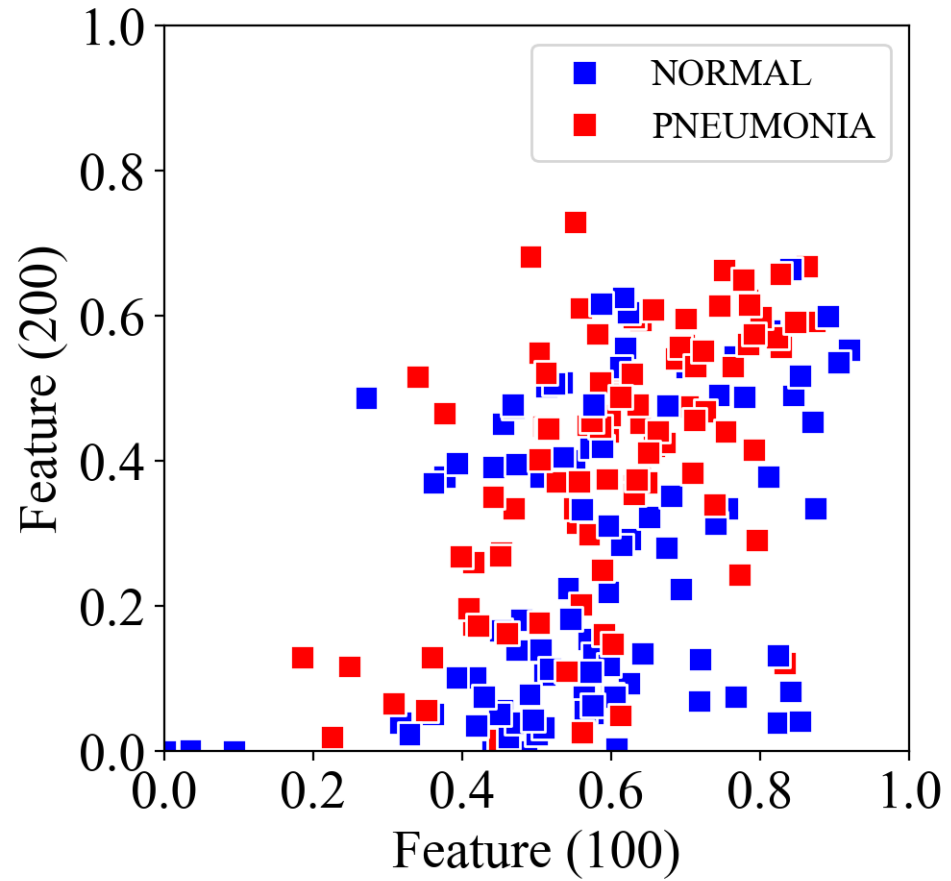
No

Pneumonia

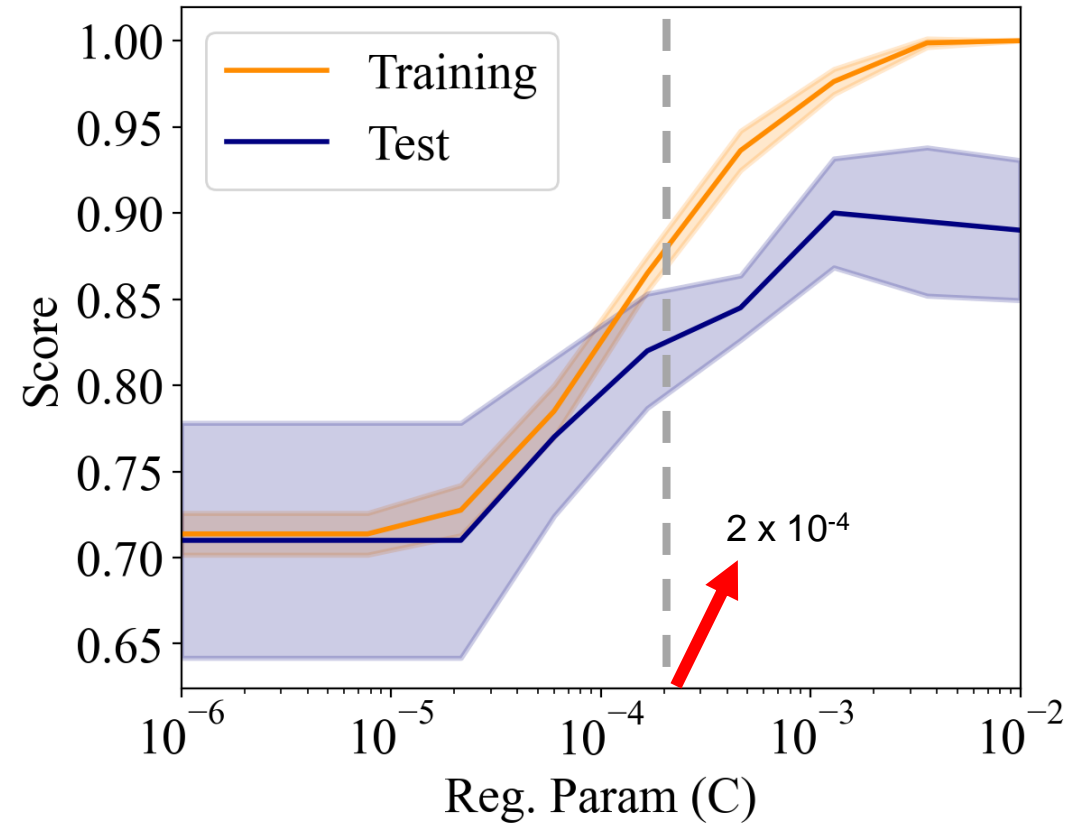
Yes

Normal

SVM Model – Feature Space



SVM (Linear) - Convergence



SVM (Linear) – Model Fit

Actual: PNEUMONIA
Predicted: PNEUMONIA
Confidence: 51.77 %



Actual: NORMAL
Predicted: NORMAL
Confidence: 91.05 %



Actual: NORMAL
Predicted: NORMAL
Confidence: 99.87 %



Actual: NORMAL
Predicted: PNEUMONIA
Confidence: 52.43 %

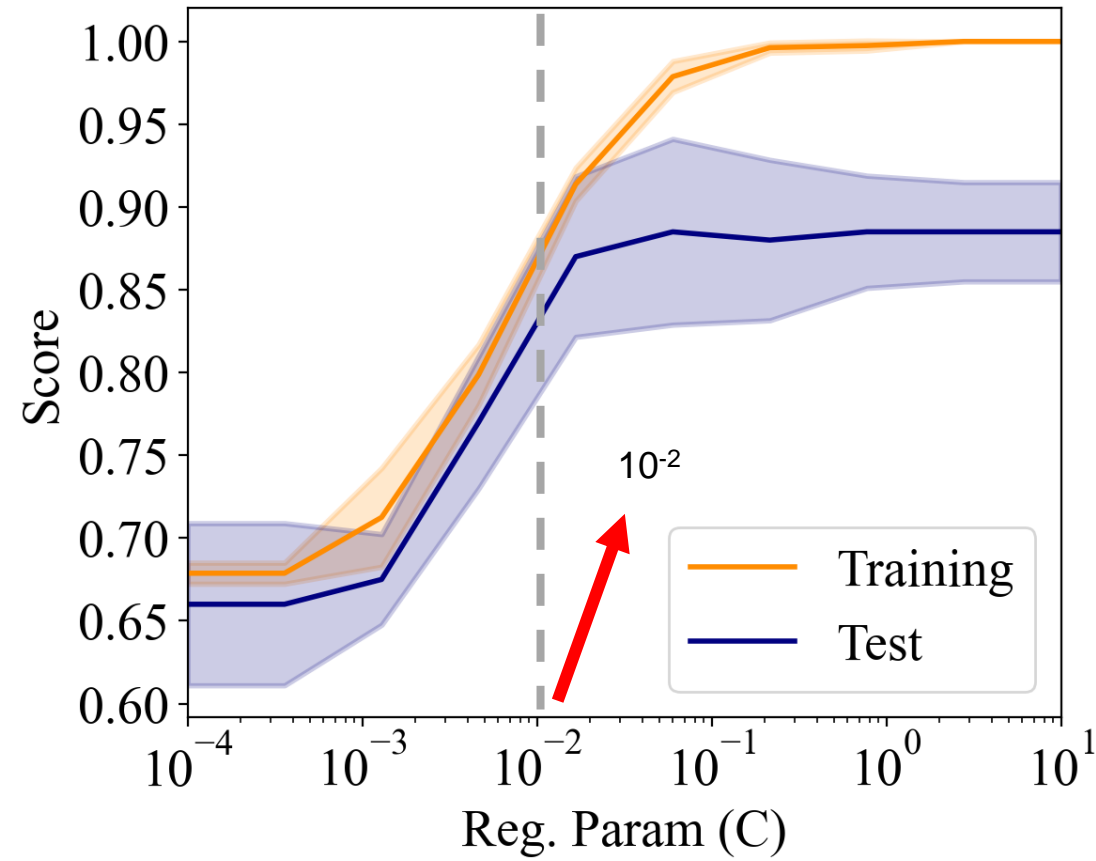


Kernel = Linear

Reg. Param = 2×10^{-4} (L2)

Model Score : 80 %

SVM (Polynomial) - Convergence



Kernel = Polynomial
Degree = 3

SVM (Polynomial) – Model Fit

Actual: NORMAL
Predicted: NORMAL
Confidence: 99.14 %



Actual: PNEUMONIA
Predicted: PNEUMONIA
Confidence: 88.18 %



Actual: PNEUMONIA
Predicted: PNEUMONIA
Confidence: 93.64 %



Actual: NORMAL
Predicted: NORMAL
Confidence: 75.07 %



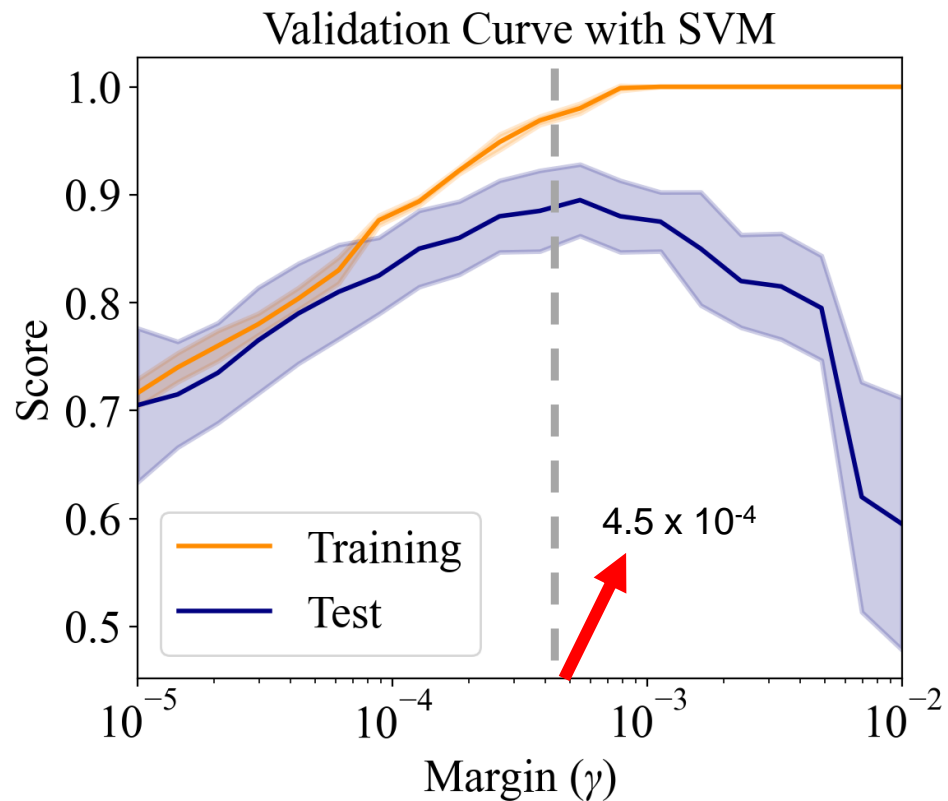
Kernel = Polynomial

Degree = 3

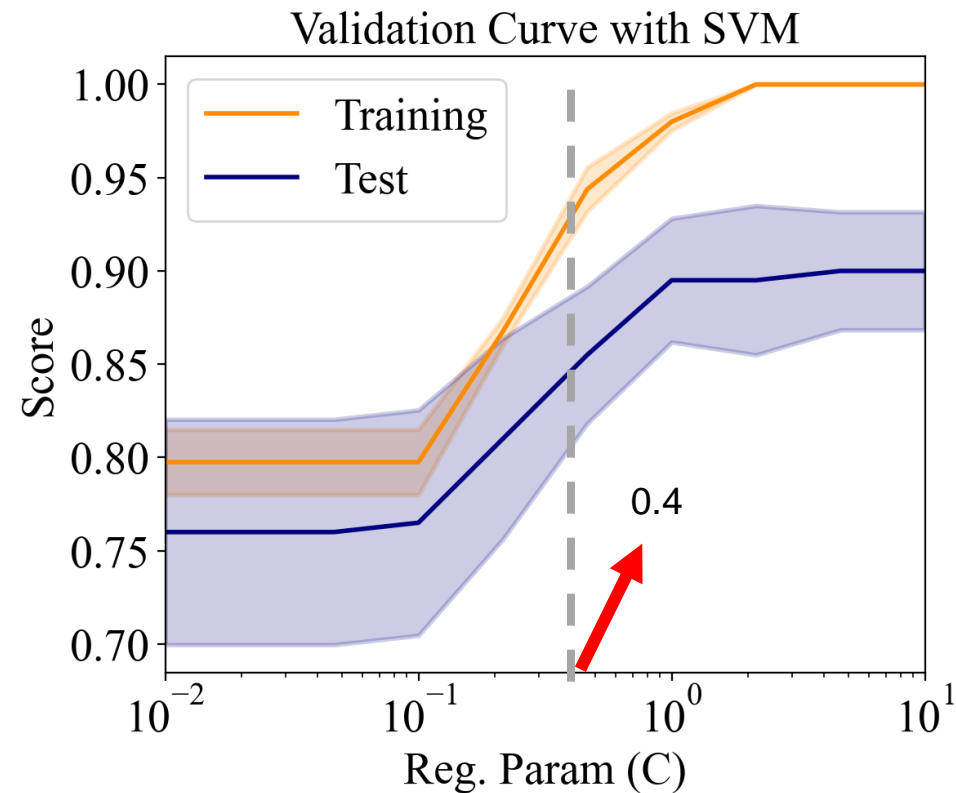
Reg. Param = 10^{-2}

Model Score : 90 %

SVM (Radial Basis Function) - Convergence



Kernel = Radial Basis Function
Reg. Param = 1



Kernel = Radial Basis Function
RBF_gamma = 5.5×10^{-4}

SVM (Radial Basis Function) – Model Fit

Actual: PNEUMONIA
Predicted: PNEUMONIA
Confidence: 95.45 %



Actual: PNEUMONIA
Predicted: PNEUMONIA
Confidence: 94.02 %



Actual: PNEUMONIA
Predicted: PNEUMONIA
Confidence: 75.34 %



Actual: NORMAL
Predicted: NORMAL
Confidence: 99.90 %



Kernel = Radial Basis Function
RBF_gamma = 5.5×10^{-4}
Reg. Param = 0.4

Model Score : 82.5 %