

# DL Ops Assignment 1

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LINKS:

Q1: [M23CSA003\\_khadga\\_DLOPS\\_A1\\_Q1.ipynb](#)

Q2: [M23CSA003\\_khadga\\_DLOPS\\_A1\\_Q2.ipynb](#)

## Question 1:

### Dataset:

For this question we are using IRIS dataset, it contains features of 150 different flowers belongiin to 3 classes.

### Model Architecture:

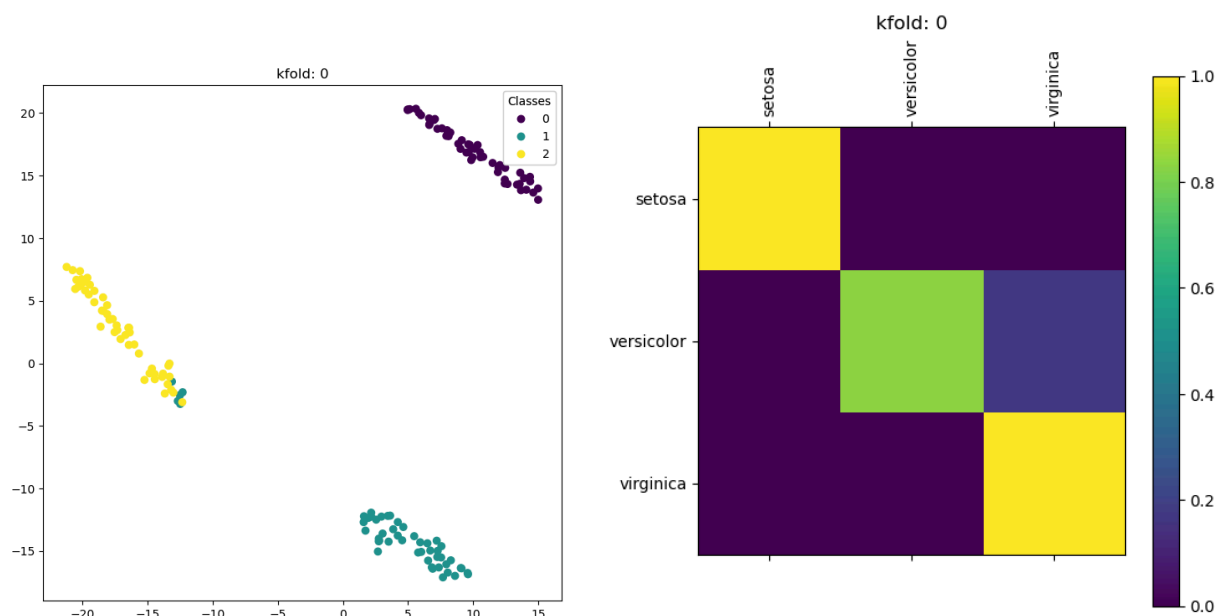
We are using a standard MLP architecture, with 2 hidden layers, one with 5 neurons and one with 7 neurons. The input layer contains 4 neurons and the output layer has 3 neurons.

### Experimental Procedure:

We train and evaluate the model using 10 fold cross-validation strategy. We use Adam optimizer along with CrossEntropy Loss function. We evaluate the model based on Accuracy score, precision and recall. We also show the representations learned by the model using the T-SNE plots. All the results are logged using Tensorboard. precision-recall curve, training loss, and accuracy curves are logged using Tensorboard.

- PR Curve is logged using Tensorboard, and tensorboard logs PR curve for different classes in different plots. So we have 3 PR plots each representing a different class in the dataset.

Results:

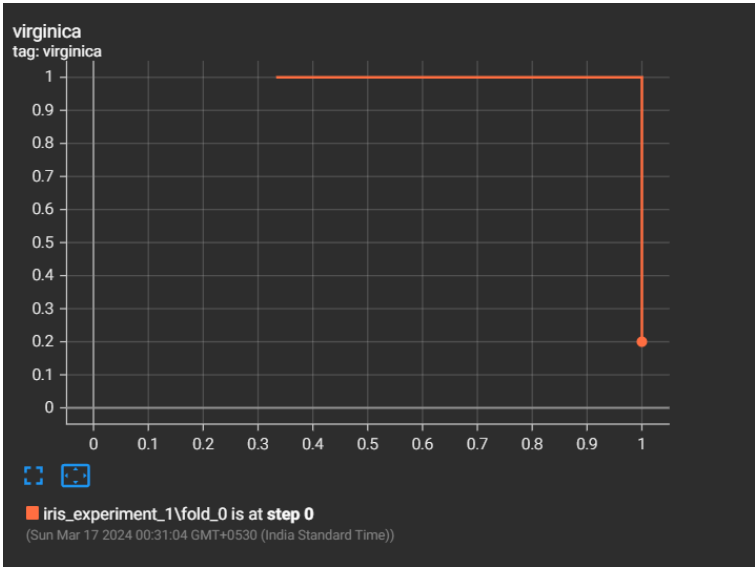
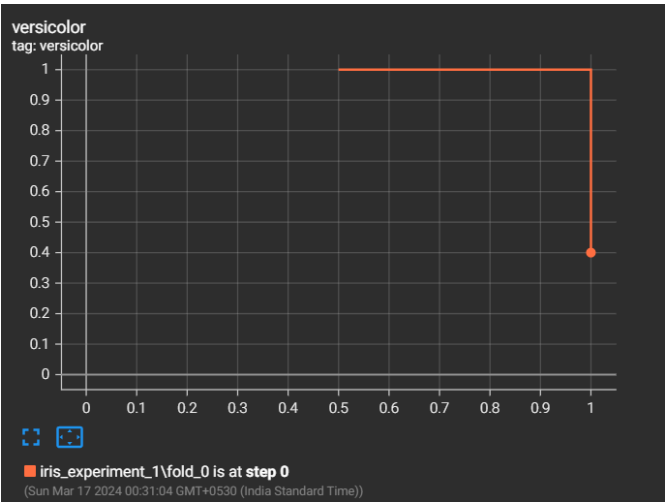
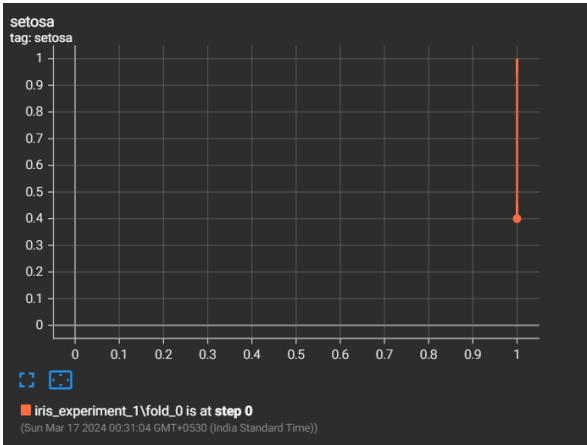


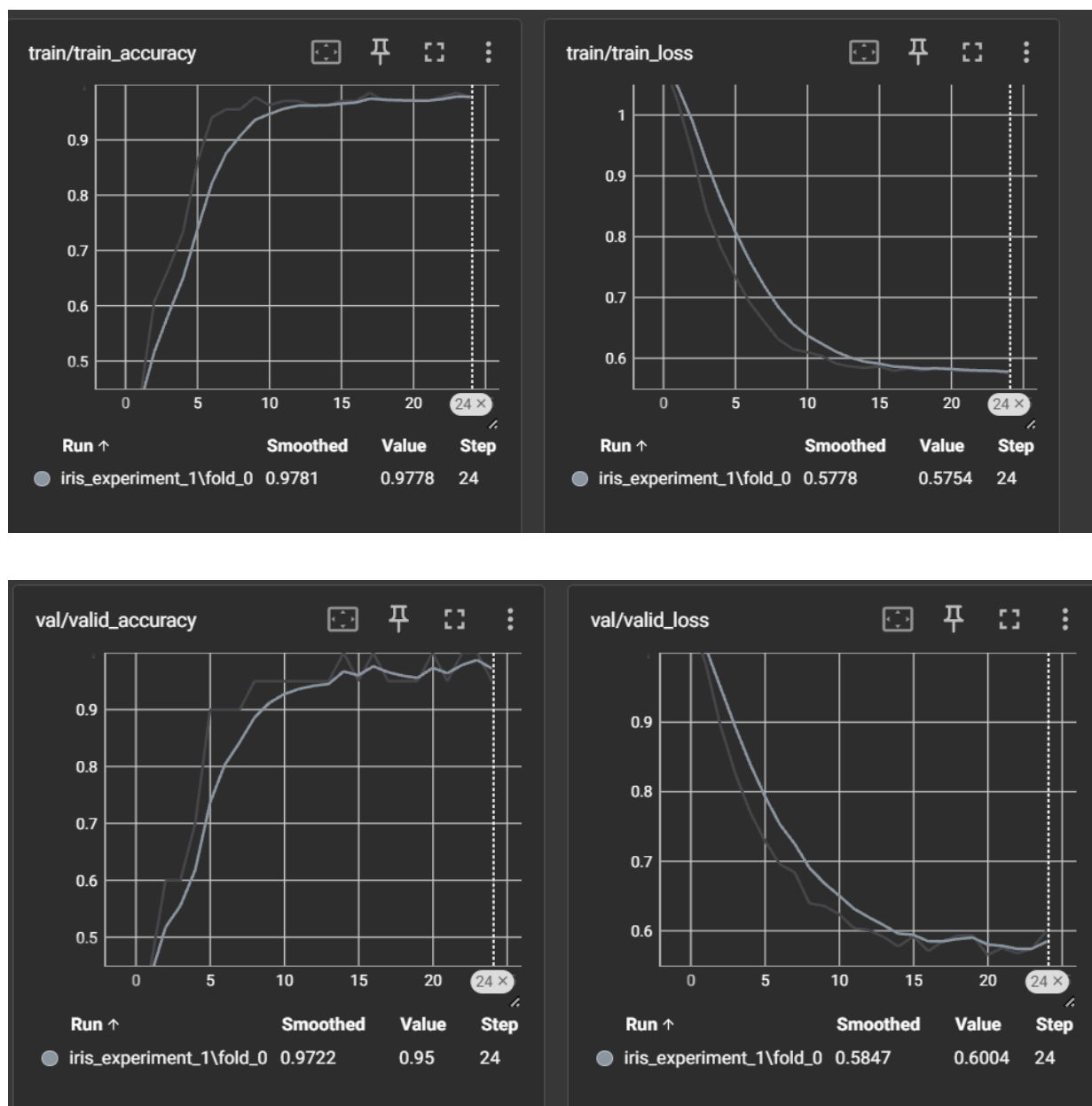
TSNE plot & Conf Matrix for fold 0.

Average Metrics on 10-fold Cross Validation

Avg. Accuracy	0.96
Avg. Precision	0.97
Avg. Recall	0.96
Avg. Loss	0.59

PR Curves for fold 0:





Train & Validation Curves for Fold 0.

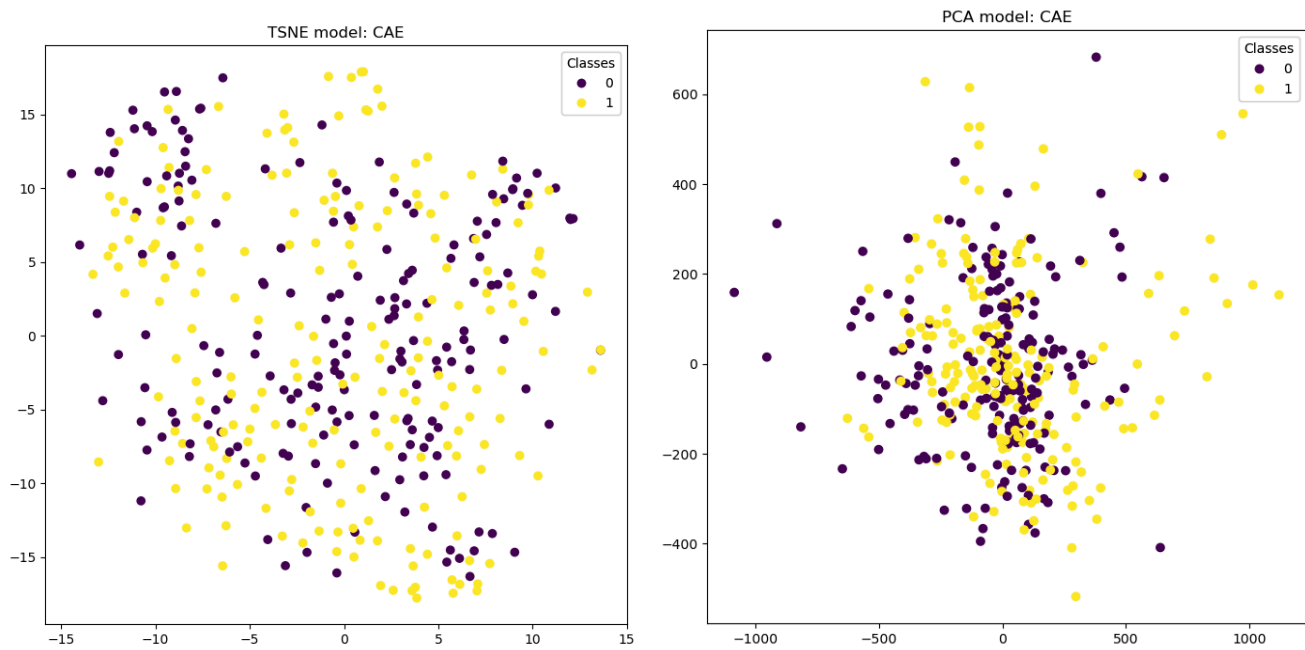
## Question 2:

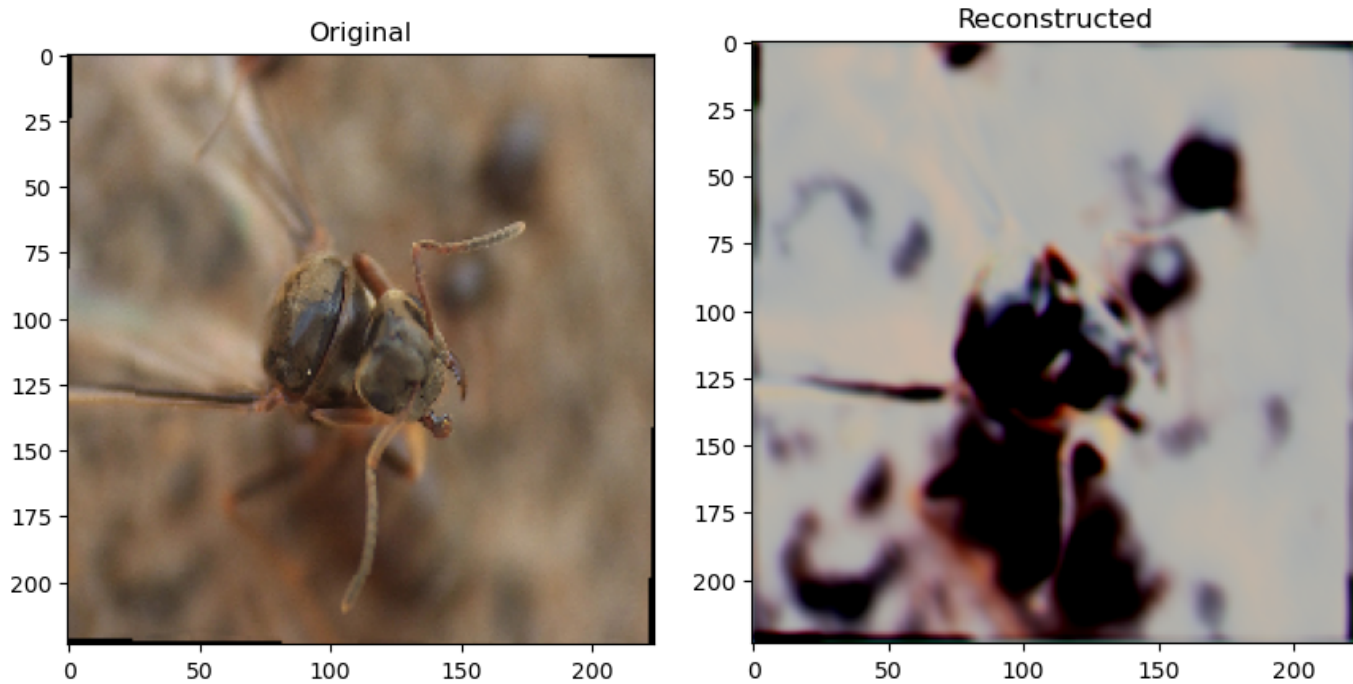
### Dataset:

The dataset used for this question is Hymenoptera dataset, which contains images of ants and bees

### Experiment 1: LAB to RGB Conversion

#### Auto encoder:

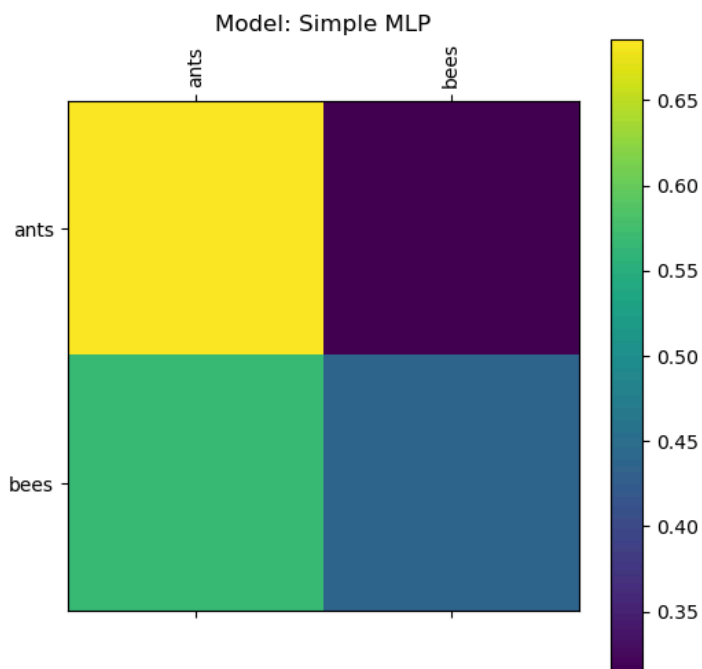




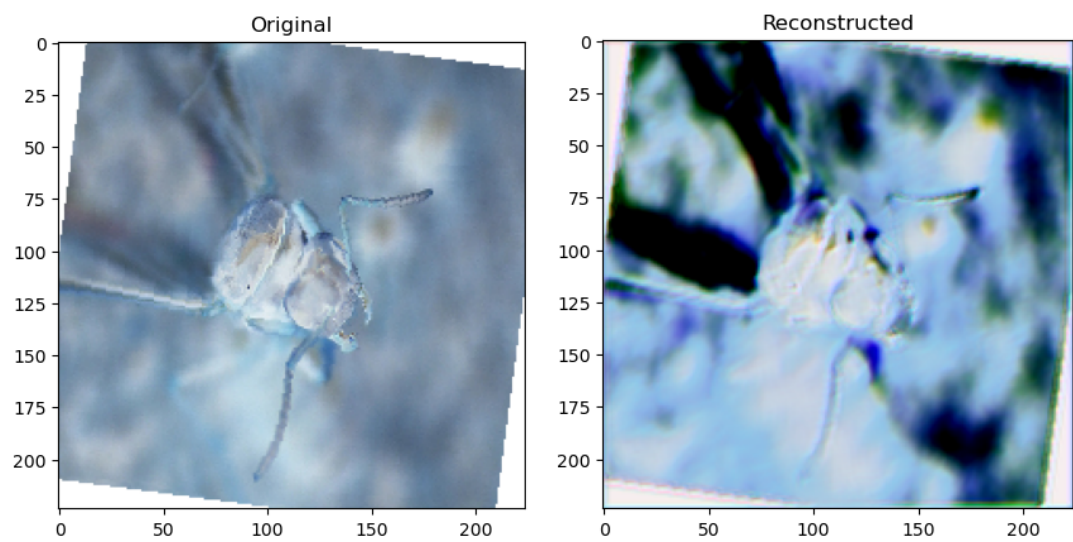
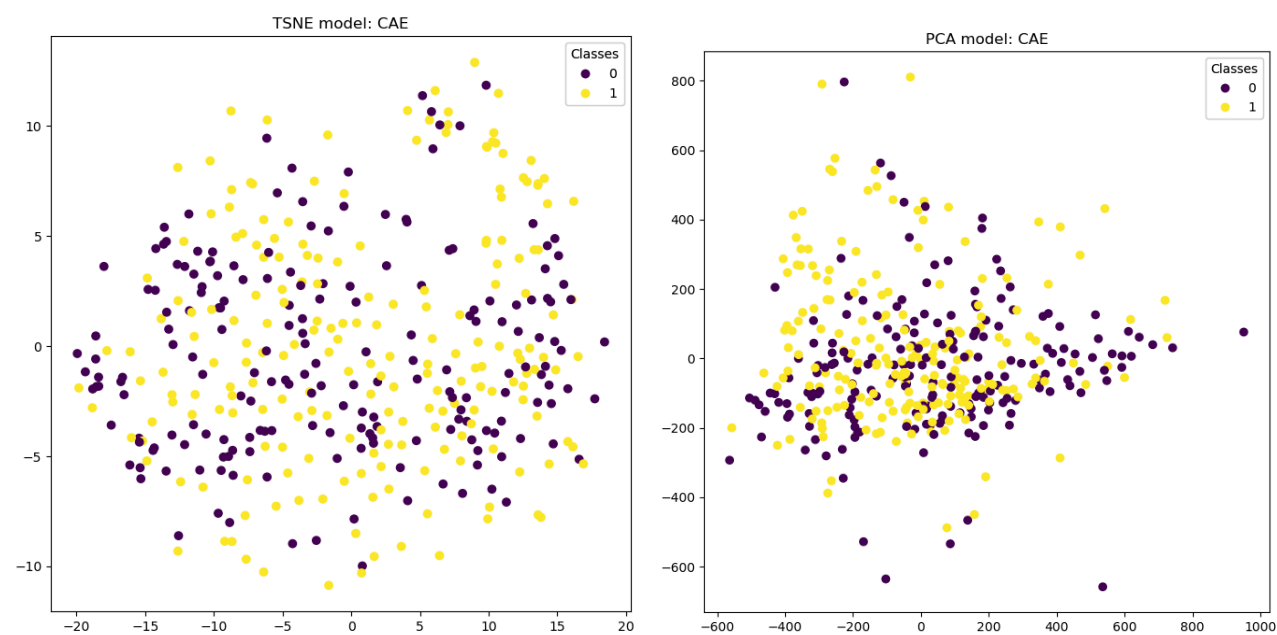
'RMSE': 0.15609028935432434,  
'StructuralSimilarityIndexMeasure': 0.45338940620422363,  
'PeakSignalNoiseRatio': 16.144805908203125,  
'loss': 0.024431928992271423

## MLP Train:

test accuracy: 0.5490196078431373  
test loss: 0.7664566040039062  
Precision: 0.5678801466139995  
Recall: 0.5490196078431373  
F1: 0.5432042578475621



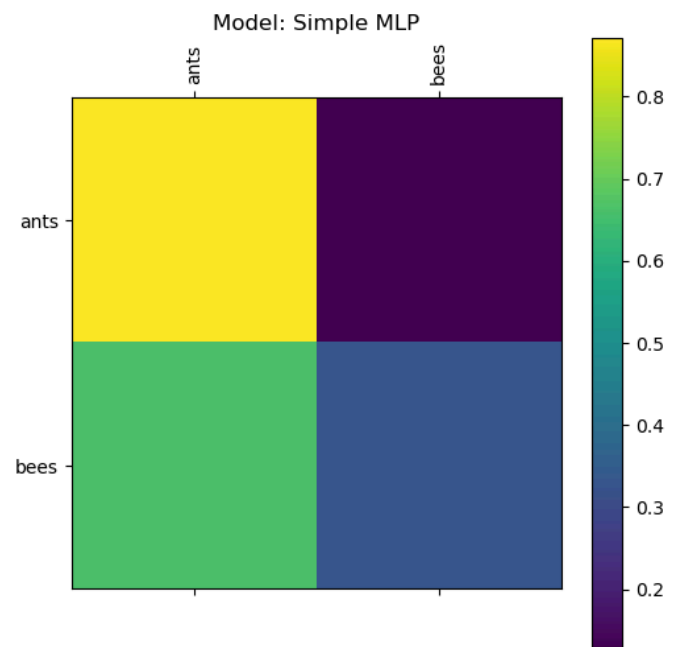
# Experiment 2: RGB to Negative



'RMSE': 0.2000989466905594  
'StructuralSimilarityIndexMeasure': 0.4690510332584381  
'PeakSignalNoiseRatio': 14.036170959472656  
'loss': 0.0405840240418911

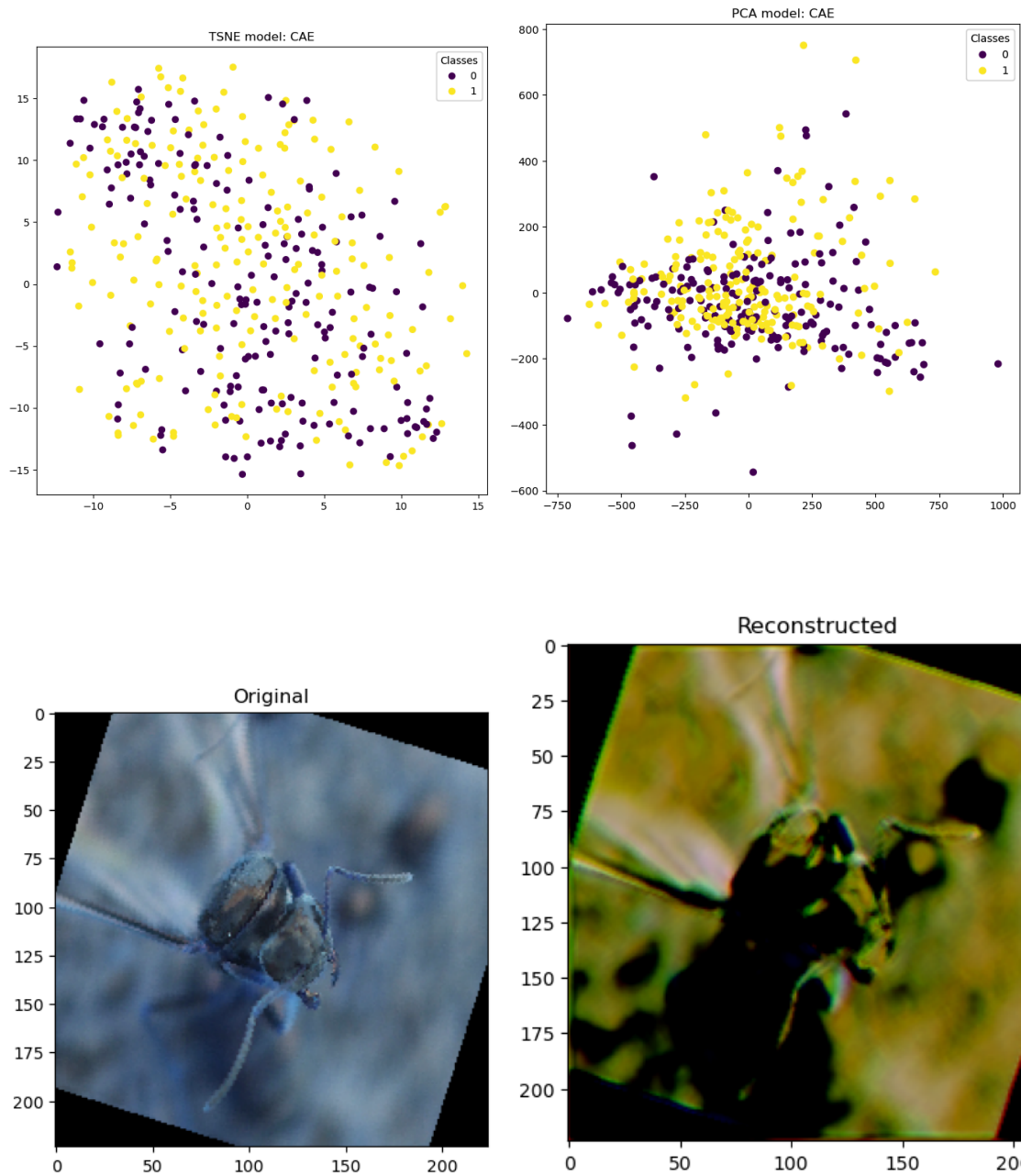
## MLP Train:

test accuracy: 0.5816993464052288  
test loss: 0.7315019965171814  
Precision: 0.6511186643032485  
Recall: 0.5816993464052288  
F1: 0.553250404104294



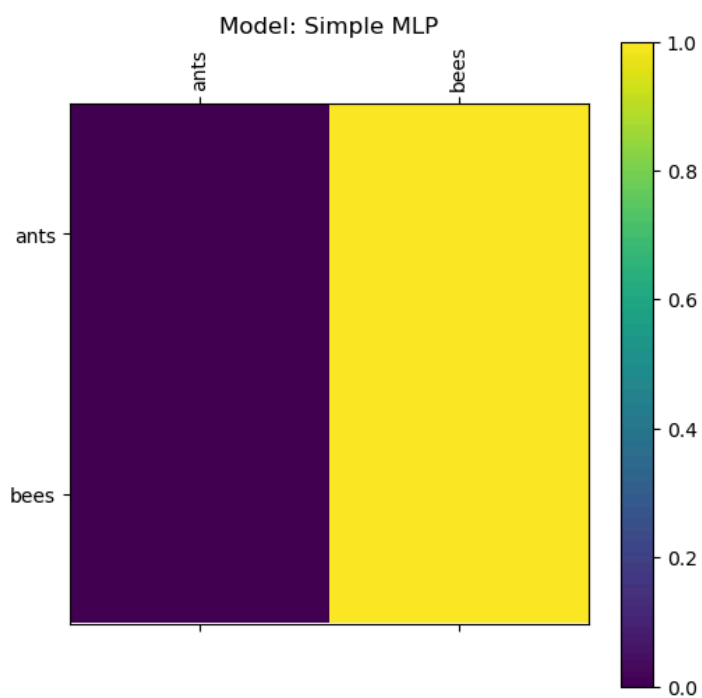


## Experiment 3: Horizontal Flip



```
{'RMSE': 0.2094229906797409, 'StructuralSimilarityIndexMeasure':  
0.4577961564064026, 'PeakSignalNoiseRatio': 13.588483810424805, 'loss':  
0.043946828693151474}
```

## MLP Train:



```
test accuracy: 0.5424836601307189, test loss: 0.7707778215408325  
Precision: 0.2942885215088214, Recall: 0.5424836601307189, F1:  
0.38157748975296335
```