

# DEEP LEARNING

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## PROJECT

### Retinal Image Disease Classification

Group No: 4

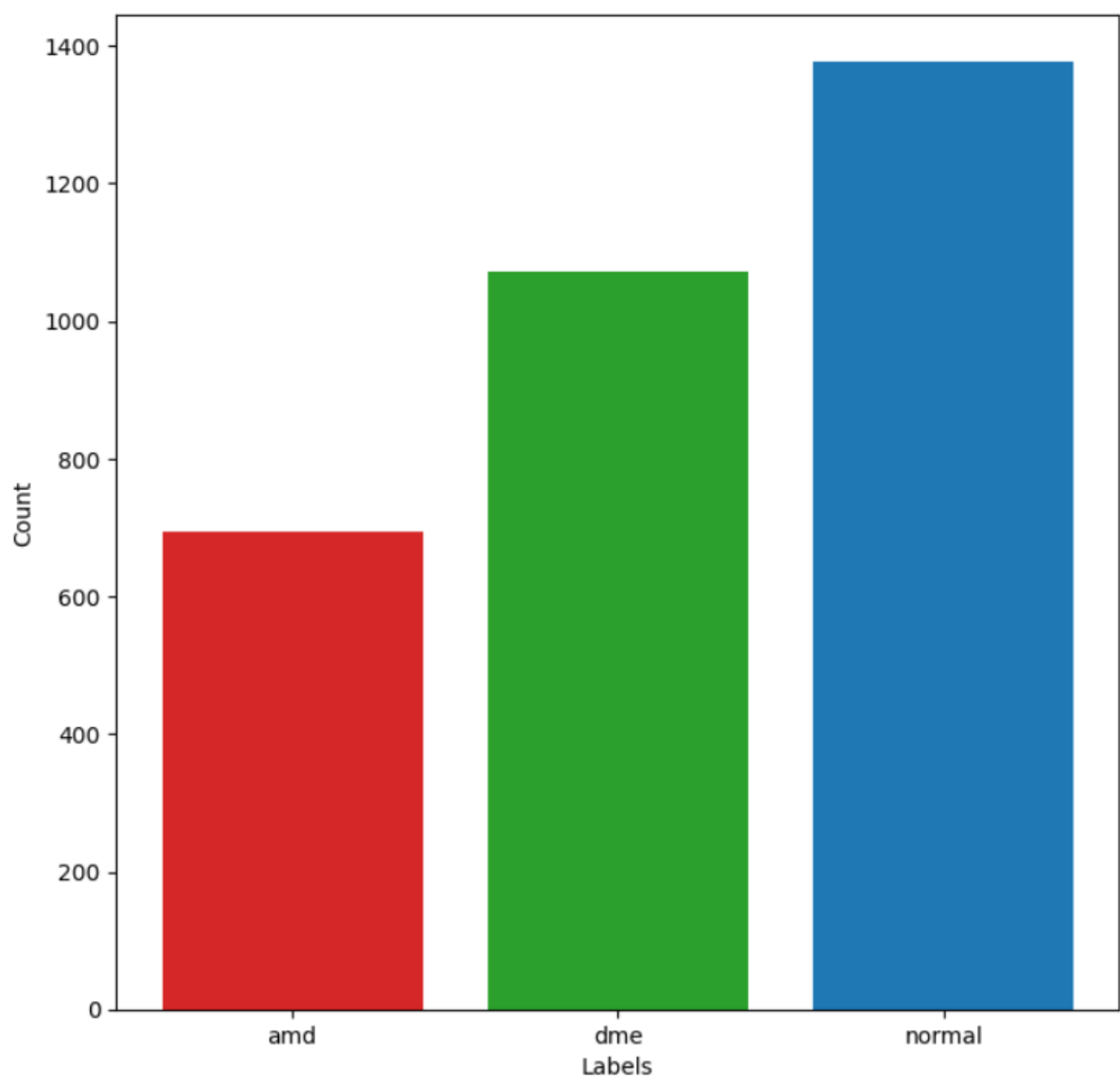
#### TEAM MEMBERS:

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## Class Imbalance



## Model.fit output

Epoch 1/30

Epoch 1: val\_loss improved from inf to 0.72587, saving model to newtemp\_model.h5

196/196 - 1165s - loss: 1.0006 - accuracy: 0.4813 - val\_loss: 0.7259 - val\_accuracy: 0.6625 - lr: 1.0000e-04 - 1165s/epoch - 6s/step

Epoch 2/30

Epoch 2: val\_loss improved from 0.72587 to 0.65147, saving model to newtemp\_model.h5

196/196 - 1156s - loss: 0.6725 - accuracy: 0.6653 - val\_loss: 0.6515 - val\_accuracy: 0.6875 - lr: 1.0000e-04 - 1156s/epoch - 6s/step

Epoch 3/30

Epoch 3: val\_loss did not improve from 0.65147

196/196 - 1152s - loss: 0.5966 - accuracy: 0.6986 - val\_loss: 0.7064 - val\_accuracy: 0.6375 - lr: 1.0000e-04 - 1152s/epoch - 6s/step

Epoch 4/30

Epoch 4: val\_loss did not improve from 0.65147

196/196 - 1154s - loss: 0.5662 - accuracy: 0.7027 - val\_loss: 0.6545 - val\_accuracy: 0.6875 - lr: 1.0000e-04 - 1154s/epoch - 6s/step

Epoch 5/30

Epoch 5: val\_loss improved from 0.65147 to 0.56038, saving model to newtemp\_model.h5

196/196 - 1158s - loss: 0.5204 - accuracy: 0.7402 - val\_loss: 0.5604 - val\_accuracy: 0.6875 - lr: 1.0000e-04 - 1158s/epoch - 6s/step

Epoch 6/30

Epoch 6: val\_loss did not improve from 0.56038

196/196 - 1153s - loss: 0.4890 - accuracy: 0.7574 - val\_loss: 0.6505 - val\_accuracy: 0.6625 - lr: 1.0000e-04 - 1153s/epoch - 6s/step

Epoch 7/30

Epoch 7: val\_loss improved from 0.56038 to 0.49066, saving model to newtemp\_model.h5

196/196 - 1165s - loss: 0.4359 - accuracy: 0.7981 - val\_loss: 0.4907 - val\_accuracy: 0.8000 - lr: 1.0000e-04 - 1165s/epoch - 6s/step

Epoch 8/30

Epoch 8: val\_loss did not improve from 0.49066

196/196 - 1153s - loss: 0.3717 - accuracy: 0.8291 - val\_loss: 0.5651 - val\_accuracy: 0.8250 - lr: 1.0000e-04 - 1153s/epoch - 6s/step

Epoch 9/30

Epoch 9: val\_loss did not improve from 0.49066

196/196 - 1147s - loss: 0.3522 - accuracy: 0.8403 - val\_loss: 0.7233 - val\_accuracy: 0.6250 - lr: 1.0000e-04 - 1147s/epoch - 6s/step

Epoch 10/30

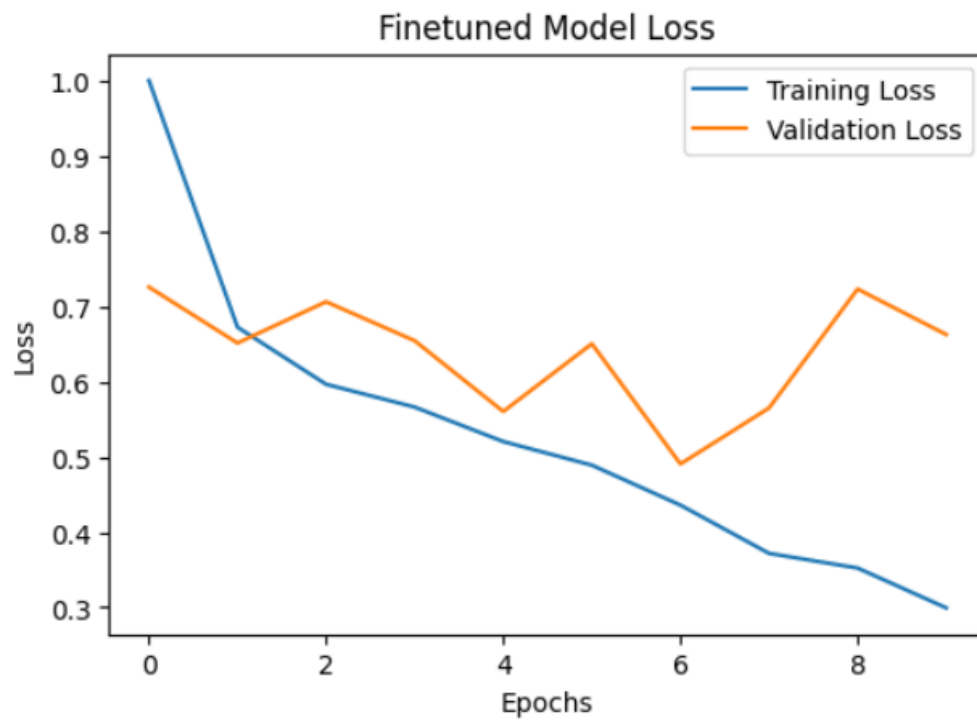
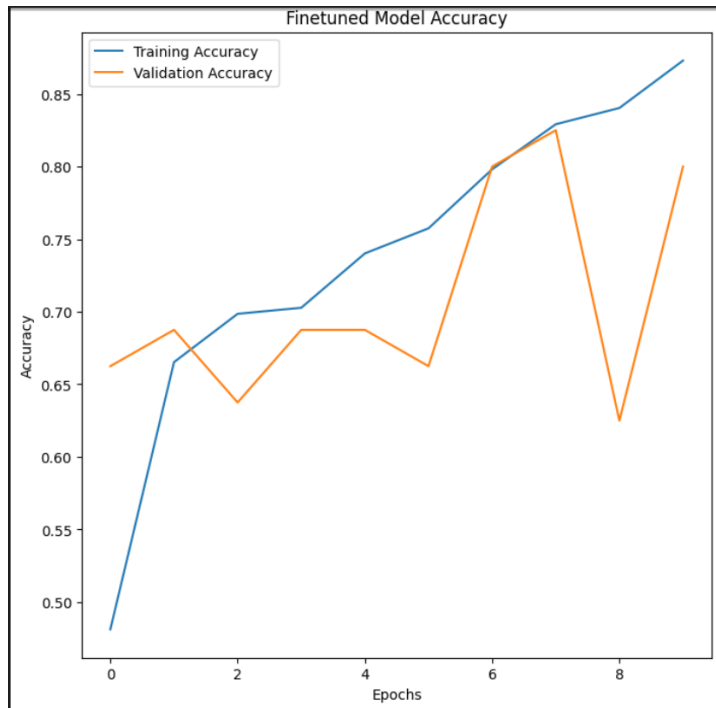
Epoch 10: val\_loss did not improve from 0.49066

Epoch 10: ReduceLROnPlateau reducing learning rate to 9.999999747378752e-06.

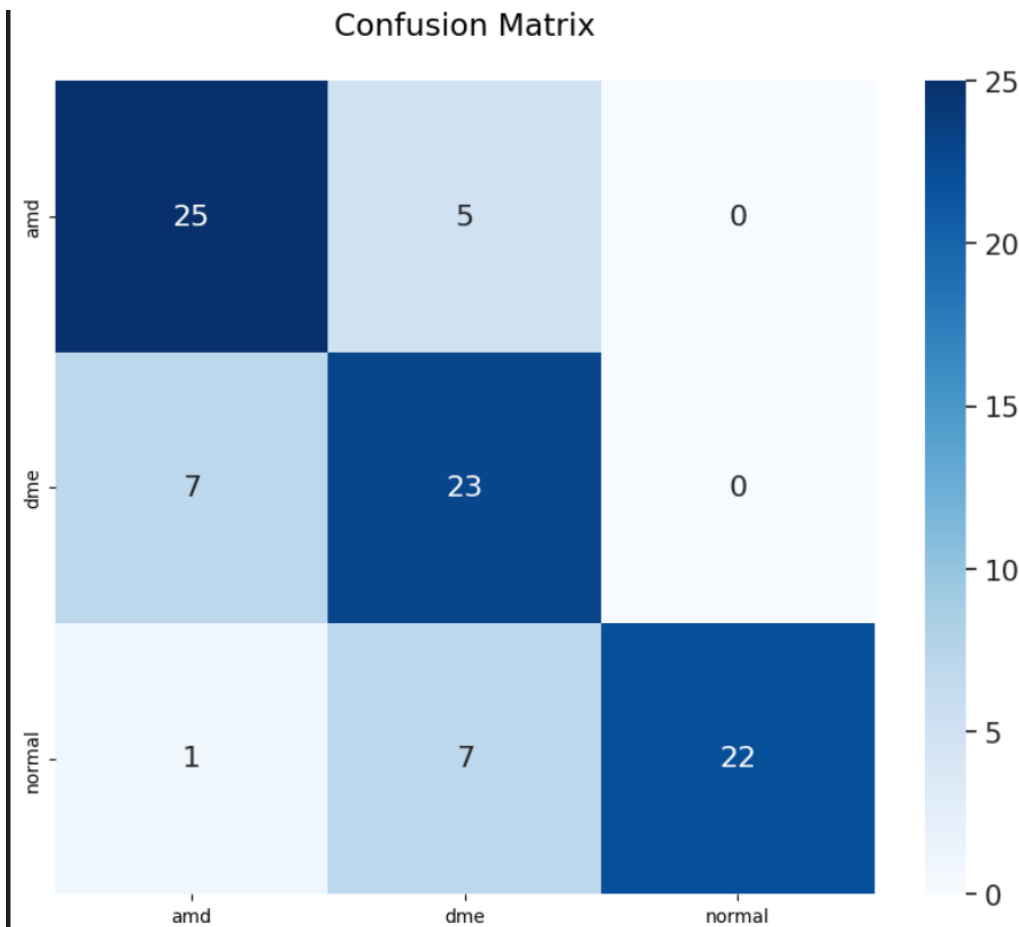
196/196 - 1151s - loss: 0.2993 - accuracy: 0.8730 - val\_loss: 0.6628 - val\_accuracy:  
0.8000 - lr: 1.0000e-04 - 1151s/epoch - 6s/step

Epoch 10: early stopping

## Model Accuracy and Loss



# Confusion Matrix & Classification Report



## Classification Report

	precision	recall	f1-score	support
amd	0.76	0.83	0.79	30
dme	0.66	0.77	0.71	30
normal	1.00	0.73	0.85	30
accuracy			0.78	90
macro avg	0.80	0.78	0.78	90
weighted avg	0.80	0.78	0.78	90