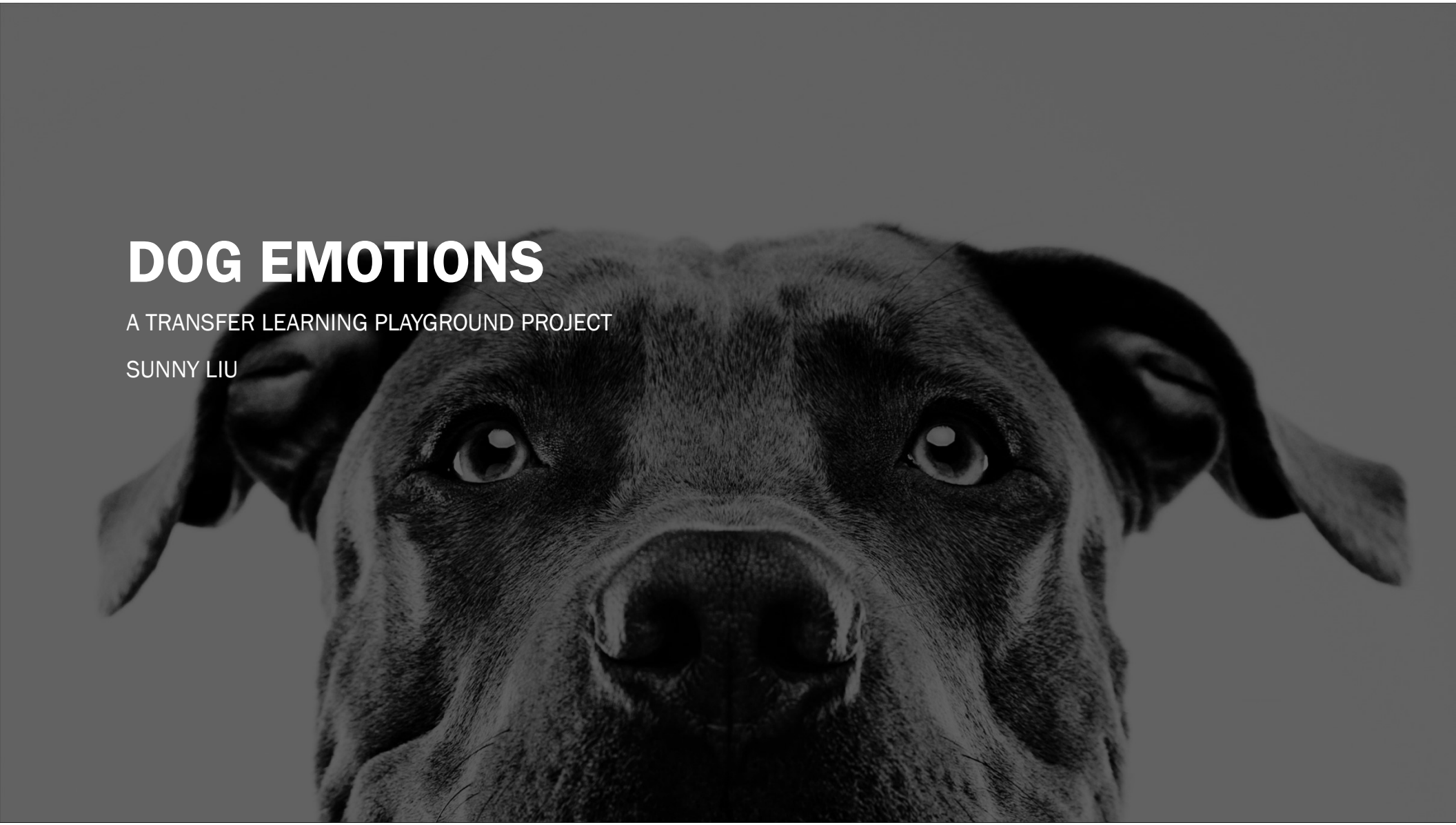


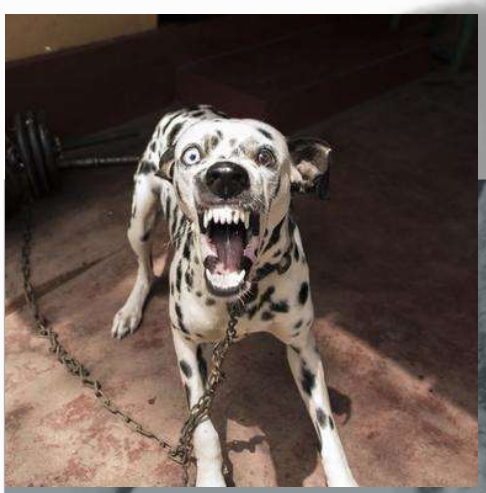
DOG EMOTIONS

A TRANSFER LEARNING PLAYGROUND PROJECT

SUNNY LIU

OVERVIEW

AN IMAGE CLASSIFIER FOR FOUR TYPES OF EMOTIONS – ANGRY, HAPPY, RELAXED, SAD

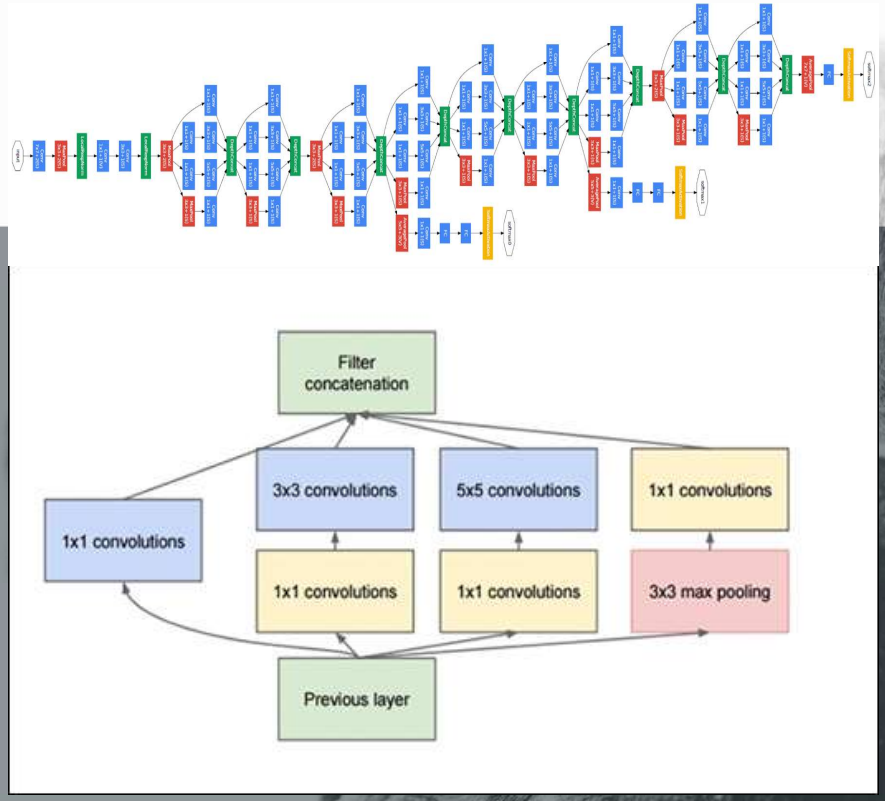


MODEL STRATEGIES

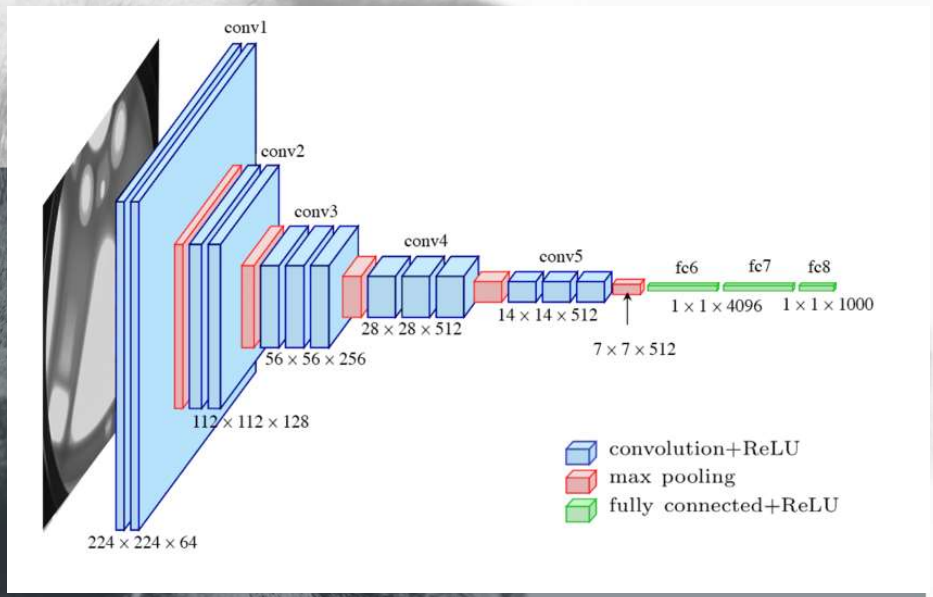
- Transfer learning using two pre-trained models
  - InceptionV3
  - VGG16
- Saving best performing model across epochs
- Regularization
  - Data Augmentation
  - Dropouts
- Pooling – Global Average Pooling 2D

INCEPTION V3 VS. VGG 16 ARCHITECTURE

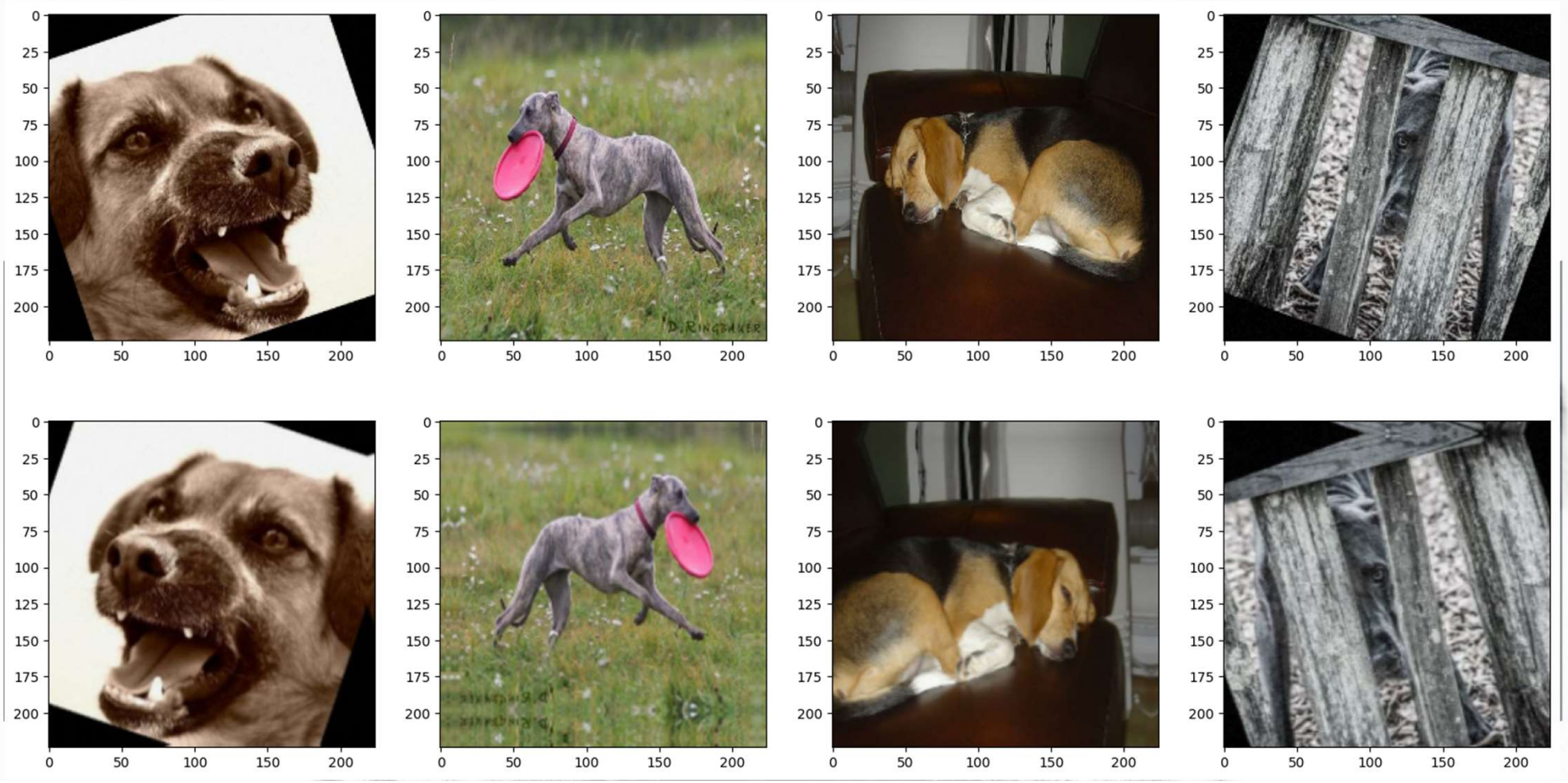
INCEPTION V3

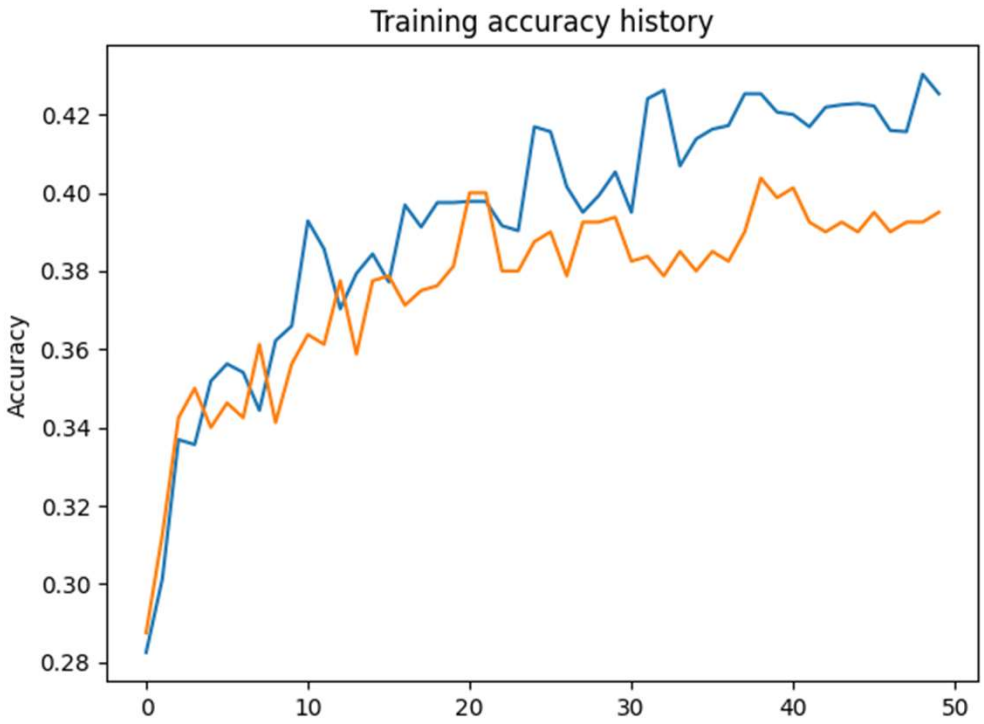


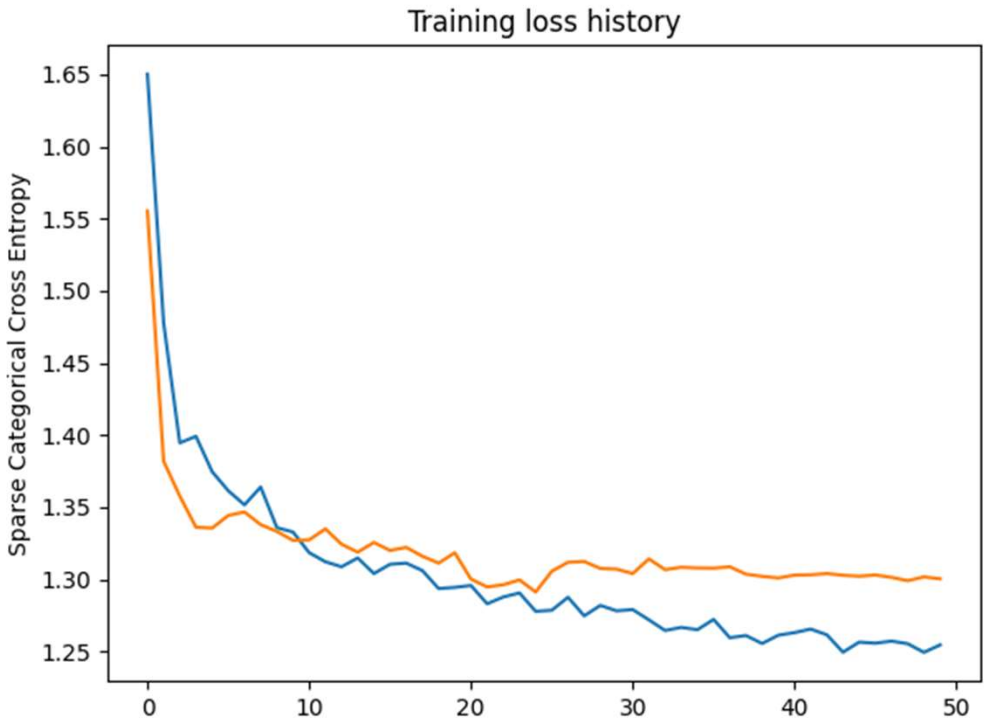
VGG 16



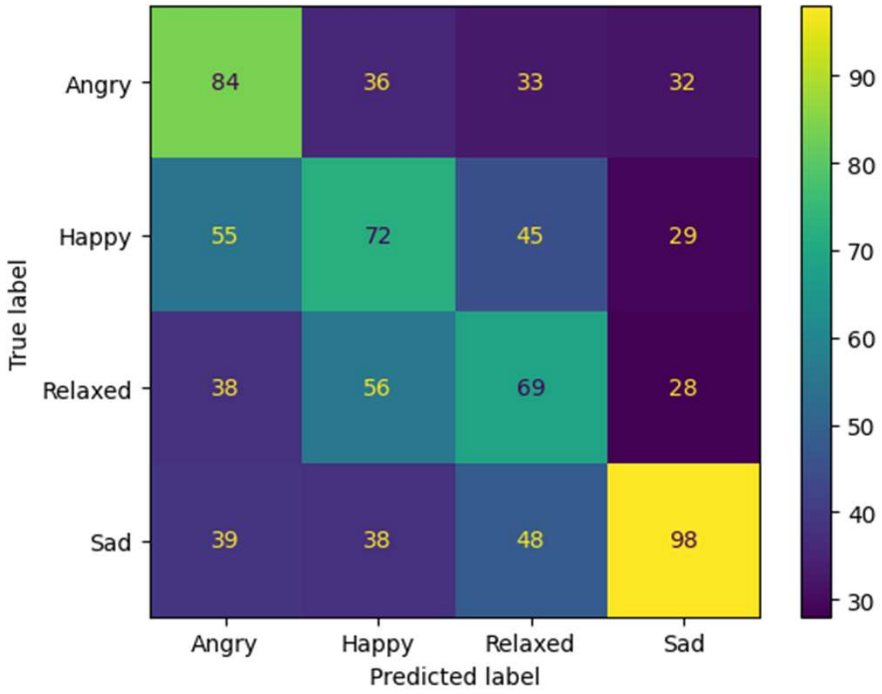
DATA AUGMENTATION





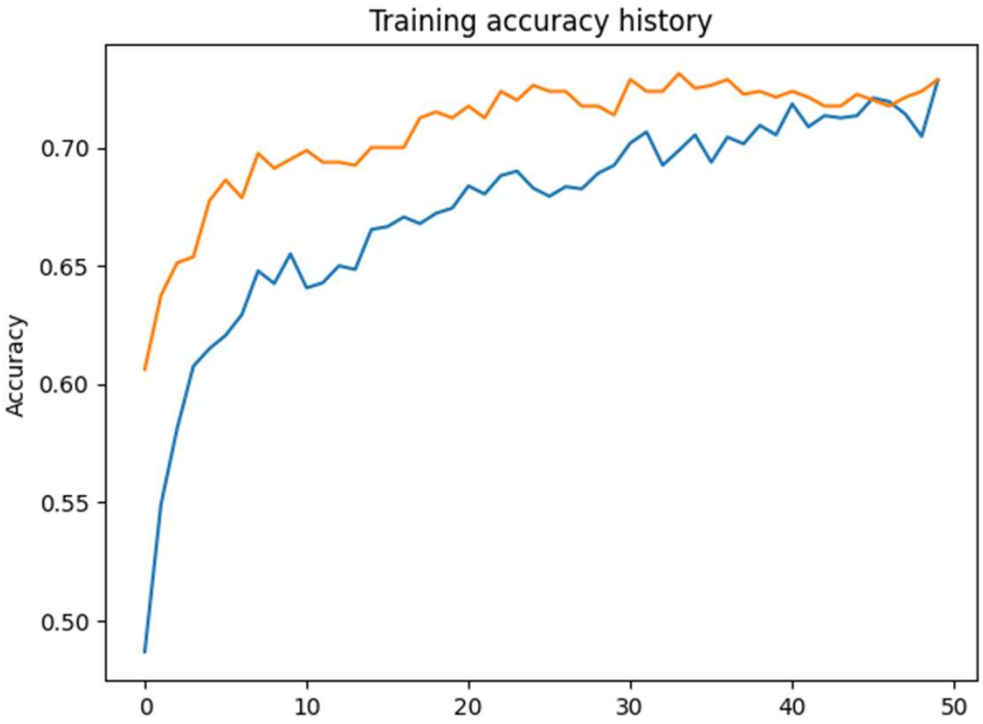


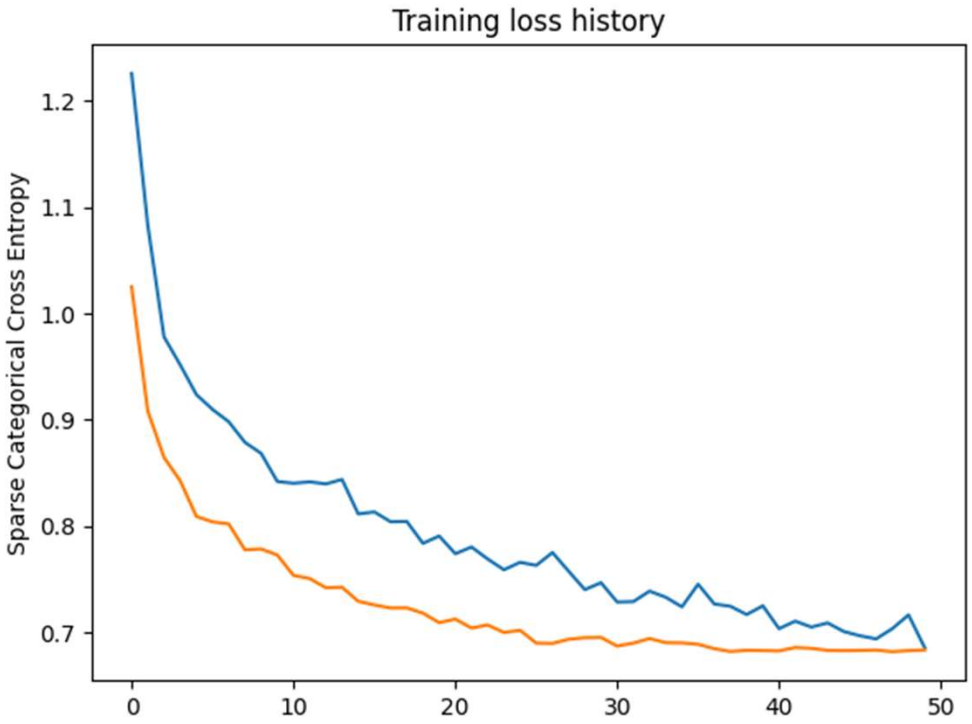
BEST INCEPTIONV3 RESULTS



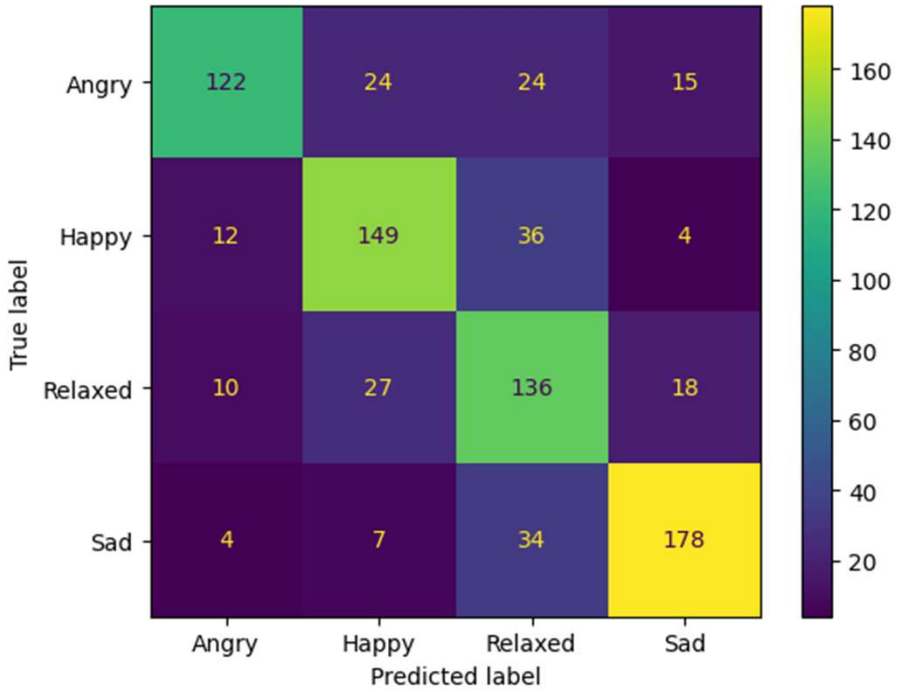
class	precision	recall	f1-score	support
Angry	0.39	0.45	0.42	185
Happy	0.36	0.36	0.36	201
Relaxed	0.35	0.36	0.36	191
Sad	0.52	0.44	0.48	223
accuracy			0.40	800
macro avg	0.41	0.40	0.40	800
weighted avg	0.41	0.40	0.41	800

BEST INCEPTIONV3 RESULTS





BEST VGG16 RESULTS



class	precision	recall	f1-score	support
Angry	0.82	0.66	0.73	185
Happy	0.72	0.74	0.73	201
Relaxed	0.59	0.71	0.65	191
Sad	0.83	0.80	0.81	223
accuracy			0.73	800
macro avg	0.74	0.73	0.73	800
weighted avg	0.74	0.73	0.73	800

BEST VGG16 RESULTS

CONCLUSIONS & NEXT STEPS

- VGG 16 works better than Inception V3 in this particular case
  - A less complex model as features extractor is better as important features are concentrated in a dog's face instead of the full image
- Visualizing feature extractions in the convolutional layers to tune further

Thanks!
Questions?