

Metis Deep Learning Presentation

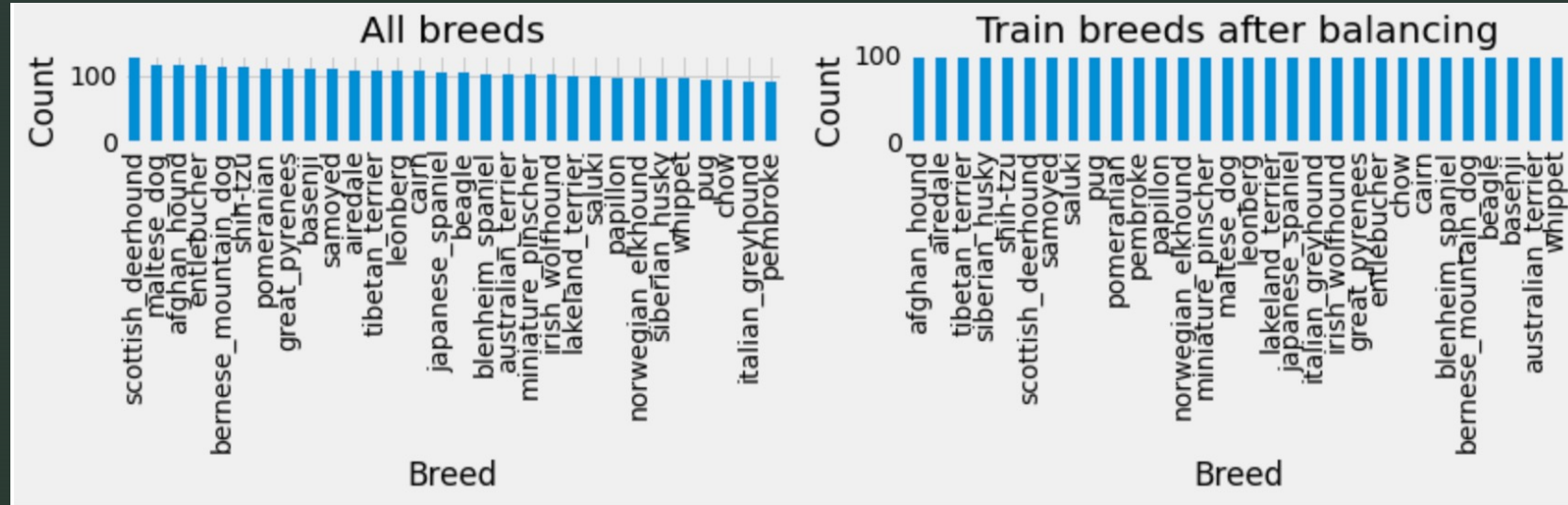
By Melanie Ackerman

4/20/22



Dog Breed Predictions

The Data



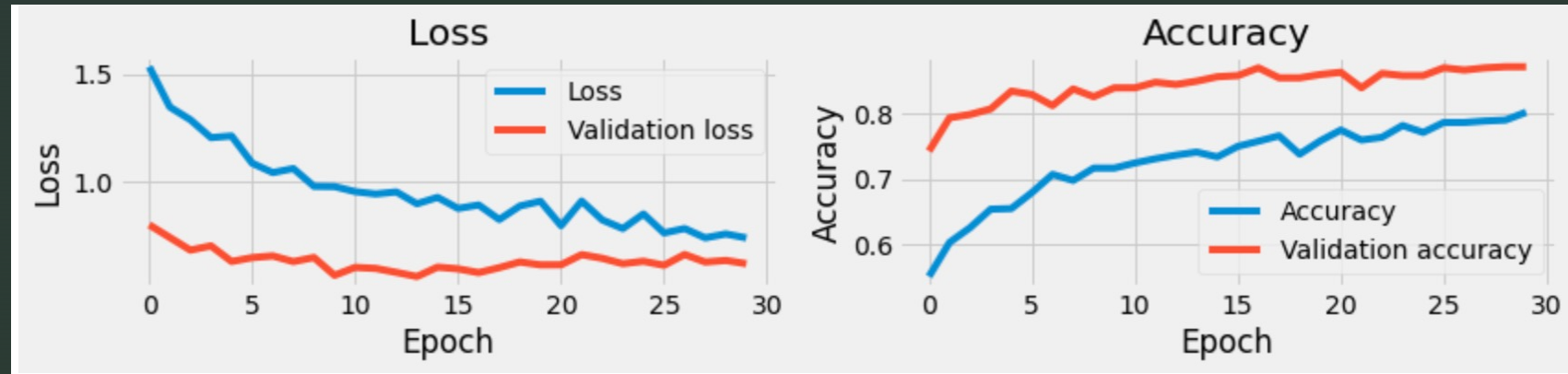
- 10,222 images of dogs
- 120 breeds
- Reduce to 12 and 30 breeds
- Classes need balancing

Creating the Model

- Transfer learning with ResNet50V2, batch normalization, global average pooling, dense
- 3 Models:
 - Prototype: 12 breeds
 - Pool dropout = .5
 - Dense dropout = .5
 - Prototype: 30 breeds
 - Pool dropout = .5
 - Dense dropout = .5
 - Final (WIP): 120 breeds
 - Pool dropout = .3
 - Dense dropout = .2



Training Performance



- Training accuracy falls as number of classes increases across models
- Higher validation accuracy in all 3 models due to dropout in training

30 Breed Model Evaluation



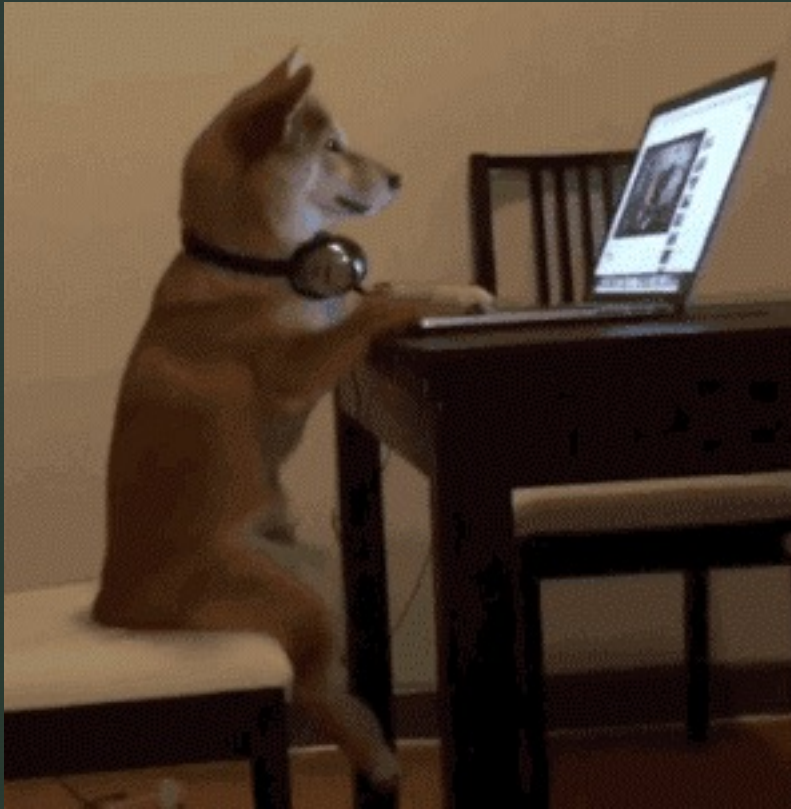
	precision	recall	f1-score	support
afghan_hound	0.74	0.81	0.78	32
airedale	0.78	0.69	0.73	26
australian_terrier	0.79	0.76	0.78	25
basenji	0.60	0.76	0.67	33
beagle	0.82	0.77	0.79	30
bernese_mountain_dog	0.96	0.86	0.91	28
blenheim_spaniel	0.79	0.73	0.76	26
cairn	0.80	0.77	0.78	26
chow	0.80	0.89	0.84	27
entlebucher	0.80	0.95	0.87	21
great_pyrenees	0.61	0.65	0.63	26
irish_wolfhound	0.38	0.29	0.32	21
italian_greyhound	0.52	0.50	0.51	30
japanese_spaniel	0.70	0.81	0.75	26
lakeland_terrier	0.47	0.50	0.48	16
leonberg	0.67	0.89	0.76	27
maltese_dog	0.81	0.59	0.68	29
miniature_pinscher	0.72	0.84	0.78	25
norwegian_elkhound	0.78	0.70	0.74	20
papillon	0.81	0.85	0.83	26
pembroke	0.91	0.80	0.85	25
pomeranian	0.80	0.80	0.80	30
pug	0.62	0.69	0.65	26
saluki	0.74	0.52	0.61	33
samoyed	0.84	0.84	0.84	25
scottish_deerhound	0.78	0.70	0.74	30
shih-tzu	0.50	0.33	0.40	27
siberian_husky	0.71	0.62	0.67	24
tibetan_terrier	0.49	0.74	0.59	27
whippet	0.50	0.47	0.48	17
accuracy			0.71	784
macro avg	0.71	0.70	0.70	784
weighted avg	0.71	0.71	0.71	784

30 Breed Model Evaluation



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Next Steps



- Try classifying umbrella breeds first (e.g. terrier, hound, etc.)
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- Adjust layers of 120 breed model; improve runtime
- Build website that allows users to enter their own image

Thank You!

