

K-means

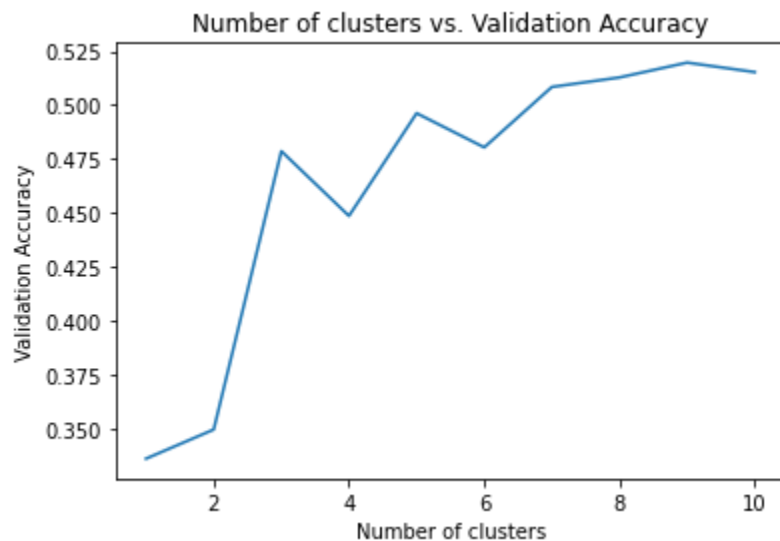
Images are 29 x 29, randomly rotated and balanced

Under 3 Clusters:

- Algorithm: "lloyd" = 48.0% validation
- Algorithm: "elkan" = 48.0% validation

- 5 clusters = 49.6% validation
- 7 clusters = 50.8% validation
- 9 clusters = 52.3% validation
- 11 clusters = 54.3% validation
- 50 clusters = 61.7% validation

- 9 clusters + lloyd = 50.2% test



RandomForest

Best parameters

- criterion='entropy'
- max_depth=9
- min_samples_leaf=4
- n_estimators=150

Images that are 29 x 29, randomly rotated and balanced

Training Accuracy is 63.11906080157287

Validation Accuracy is 60.516592657876004

Test Accuracy is 49.052412601590184

Accuracies are different than in the RandomForest notebook

Training Accuracy is 86.19509525285363

Validation Accuracy is 77.19267316608783

[Confusion Matrix for Random Forest](#)

[Normalized Confusion Matrix](#)

[ROC Curve](#)

CNN

Images that are 29 x 29, randomly rotated and balanced

All done for 5 epochs with batch size of 64

[First model](#)

0.0001	0.773
0.001	0.786
0.01	0.744

Adam	0.794
SGD	0.650
RMSprop	0.805
Adagrad	0.659

Relu	0.809
Tanh	0.740
Elu	0.762
Selu	0.777

64	0.809
32	0.802
128	0.775

[Confusion Matrix](#)

[Normalized Confusion Matrix](#)

[ROC Curve](#)

AUC: 0.928634285738689

Transfer Learning

LeNet-5 with 32 x 32	0.865
^ With a dropout rate of 50%	0.861
^ With two dropout layers of 50%	0.841
Idk why by running it again gave ->	0.834

[Confusion Matrix](#)

AUC: 0.9505320802596673

[ROC Curve](#)

New

[Confusion Matrix](#)

[Normalized Confusion Matrix](#)

[ROC Curve](#)

InceptionV3 with 75 x 75 and relu64	
^ With new dataset	0.834

[Confusion Matrix](#)

[Raw Confusion Matrix](#)

[Multi-Class ROC](#)

With updated dataset

[Confusion Matrix](#)

[Raw Confusion Matrix](#)

[ROC Curve](#)

VGG16 with 32 x 32 Relu128 + relu64	0.90289652347564

[Confusion Matrix](#)

[Raw Confusion Matrix](#)
[Multi-Class ROC](#)

VGG16 Final (32x32) augment images + drop out layer	0.8784443736076355
^ With the new dataset	0.8943109512329102
"Best model"	

[Confusion Matrix](#)
[Raw Confusion Matrix](#)
[Multi-Class ROC Curve](#)

With our updated dataset

[Confusion Matrix](#)
[Raw Confusion Matrix](#)
[ROC Curve](#)

Other important figures



