

CS337 Course Project

Face Recognition

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1 Dataset

We use the Labelled Faces in the Wild (LFW) dataset. It has been taken from Kaggle. There is an uneven distribution of images, with only 10 people having at least 53 images. Thus, we train the model to classify these 10 people, with our dataset containing 53 images for each. The train-test split is 80-20, and the train set is further split to create the validation set.

2 Model Architecture

We use a Convolutional Neural Network (CNN) to create a multi-class image classifier. The network is inspired from FaceNet [1].

Layer	In	Out	Kernel	Params
conv1	$250 \times 250 \times 3$	$123 \times 123 \times 64$	$7 \times 7 \times 3, 2$	9K
batchnorm1	$123 \times 123 \times 64$	$123 \times 123 \times 64$		128
relu1	$123 \times 123 \times 64$	$123 \times 123 \times 64$		0
maxpool1	$123 \times 123 \times 64$	$61 \times 61 \times 64$	$2 \times 2 \times 64, 2$	0
dropout1	$61 \times 61 \times 64$	$61 \times 61 \times 64$		0
conv2	$61 \times 61 \times 64$	$61 \times 61 \times 128$	$3 \times 3 \times 64, 1$	74K
batchnorm2	$61 \times 61 \times 128$	$61 \times 61 \times 128$		256
relu2	$61 \times 61 \times 128$	$61 \times 61 \times 128$		0
maxpool2	$61 \times 61 \times 128$	$30 \times 30 \times 128$	$2 \times 2 \times 128, 2$	0
dropout2	$30 \times 30 \times 128$	$30 \times 30 \times 128$		0
conv3	$30 \times 30 \times 128$	$30 \times 30 \times 256$	$3 \times 3 \times 128, 1$	295K
batchnorm3	$30 \times 30 \times 256$	$30 \times 30 \times 256$		512
relu3	$30 \times 30 \times 256$	$30 \times 30 \times 256$		0
maxpool3	$30 \times 30 \times 256$	$15 \times 15 \times 256$	$2 \times 2 \times 128, 2$	0
dropout3	$15 \times 15 \times 256$	$15 \times 15 \times 256$		0
conv4	$15 \times 15 \times 256$	$15 \times 15 \times 64$	$3 \times 3 \times 256, 1$	148K
batchnorm4	$15 \times 15 \times 64$	$15 \times 15 \times 64$		128
relu4	$15 \times 15 \times 64$	$15 \times 15 \times 64$		0
dropout4	$15 \times 15 \times 64$	$15 \times 15 \times 64$		0
flatten	$15 \times 15 \times 64$	14400		0
fc1	14400	1024		14M
relu5	1024	1024		0
dropout5	1024	1024		0
fc2	1024	64		66K
relu5	64	64		0
dropout5	64	64		0
fc3	64	10		650
Total				15M

Table 1: Model Architecture

References

- [1] F. Schroff, D. Kalenichenko, and J. Philbin. Facenet: A unified embedding for face recognition and clustering. In *2015 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 815–823, 2015.