Datasets

- Fashion MNIST Dataset

- Labeled Faces in the Wild Dataset

CNN Architectures

- MiniVGGNet

- MiniGoogLeNet

Setup

- Scaled image sizes

- Limited training time

- Varied learning rates

- Original and Augmented

Training

Fashion MNIST				LFW Faces			
Without augmentation		With augmentation		Without augmentation		With augmentation	
MVGGN	MGLN	MVGGN	MGLN	MVGGN	MGLN	MVGGN	MGLN
LR 1e-4	LR 1e-4	LR 1e-4	LR 1e-4	LR 1e-4	LR 1e-4	LR 1e-4	LR 1e-4
LR 1e-3	LR 1e-3	LR 1e-3	LR 1e-3	LR 1e-3	LR 1e-3	LR 1e-3	LR 1e-3
LR 1e-2	LR 1e-2	LR 1e-2	LR 1e-2	LR 1e-2	LR 1e-2	LR 1e-2	LR 1e-2
LR 1e-1	LR 1e-1	LR 1e-1	LR 1e-1	LR 1e-1	LR 1e-1	LR 1e-1	LR 1e-1

Training

Fashion MNIST				LFW Faces			
Without augmentation		With augmentation		Without augmentation		With augmentation	
MVGGN	MGLN	MVGGN	MGLN	MVGGN	MGLN	MVGGN	MGLN
LR 1e-4	LR 1e-4	LR 1e-4	LR 1e-4	LR 1e-4	LR 1e-4	LR 1e-4	LR 1e-4
LR 1e-3	LR 1e-3	LR 1e-3	LR 1e-3	LR 1e-3	LR 1e-3	LR 1e-3	LR 1e-3
LR 1e-2	LR 1e-2	LR 1e-2	LR 1e-2	LR 1e-2	LR 1e-2	LR 1e-2	LR 1e-2
LR 1e-1	LR 1e-1	LR 1e-1	LR 1e-1	LR 1e-1	**LR 1e-1**	LR 1e-1	**LR 1e-1**

```
           accuracy                      0.86
          macro avg      0.84    0.82    0.82
       weighted avg      0.87    0.86    0.86
```
(precision)   (recall)   (f1)

```
           accuracy                      0.94
          macro avg      0.94    0.94    0.94
       weighted avg      0.94    0.94    0.94
```
(precision)   (recall)   (f1)

```
           accuracy                      0.88
          macro avg      0.87    0.83    0.83
       weighted avg      0.90    0.88    0.88
```
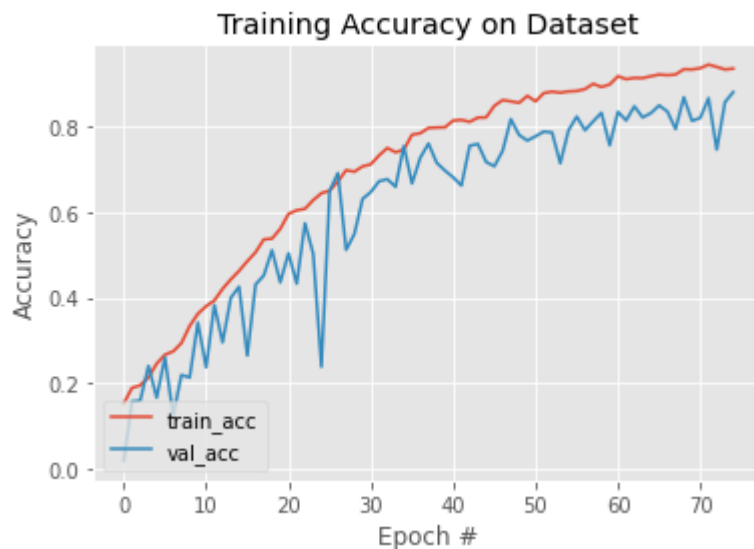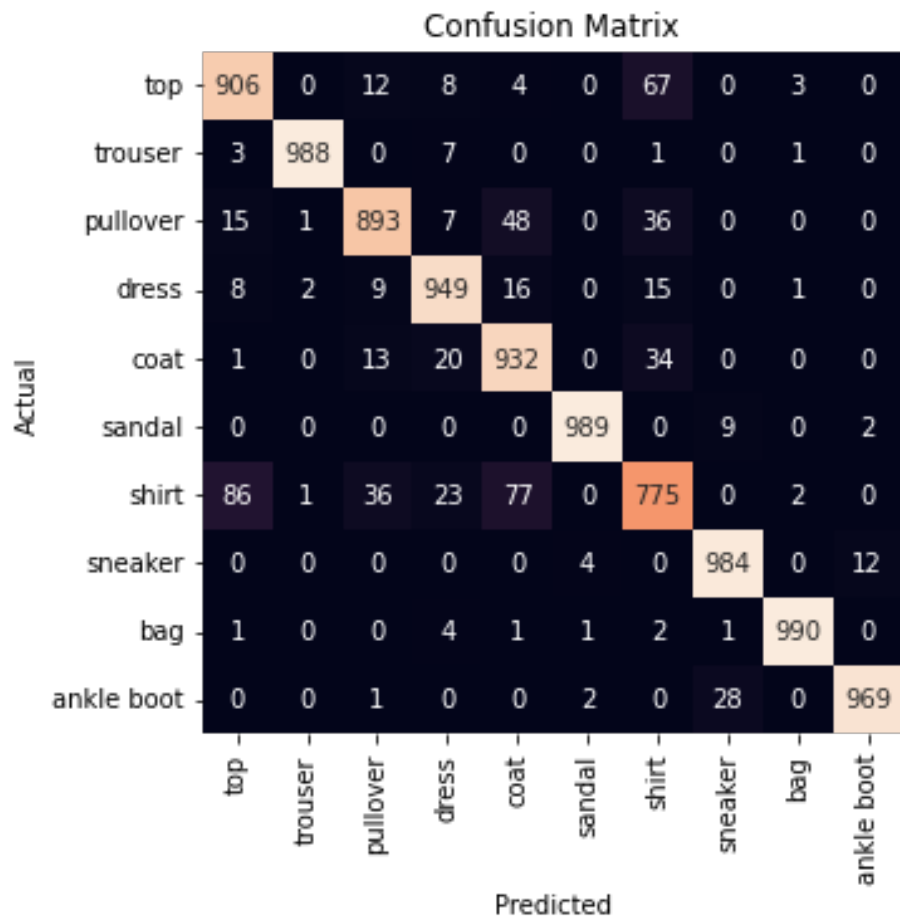(precision)   (recall)   (f1)

Augmentation and Learning Curves
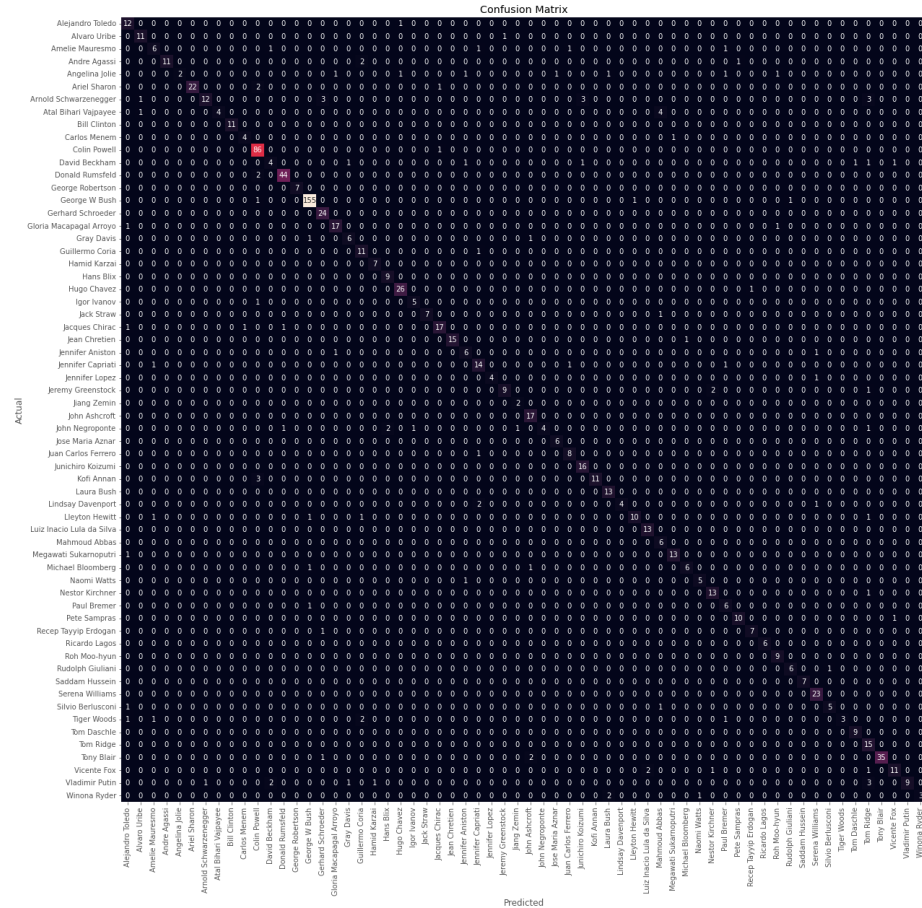
Without augmentation
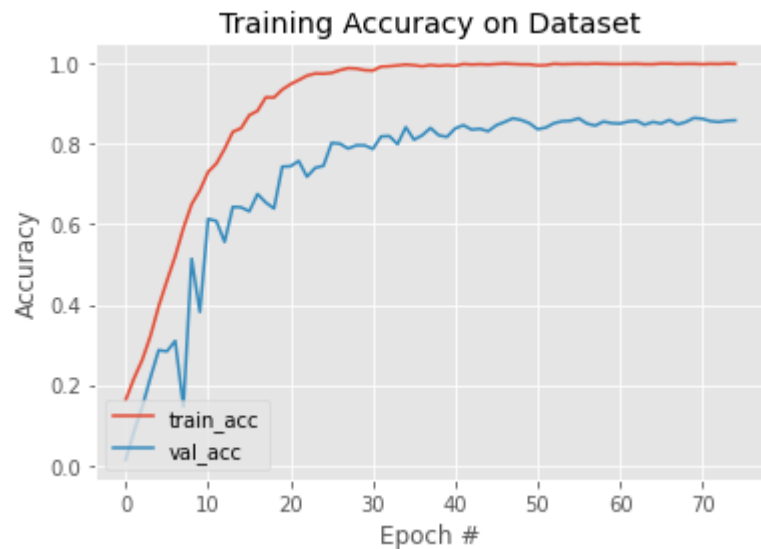
With augmentation

MNIST Fashion Confusion Matrix

Confusion Matrix

LFW People Confusion Matrix

Confusion Matrix

Limitations

- Resource limitations
  - Longer training → better results
  - More samples → generalization

- Difficulties setting seed for Keras