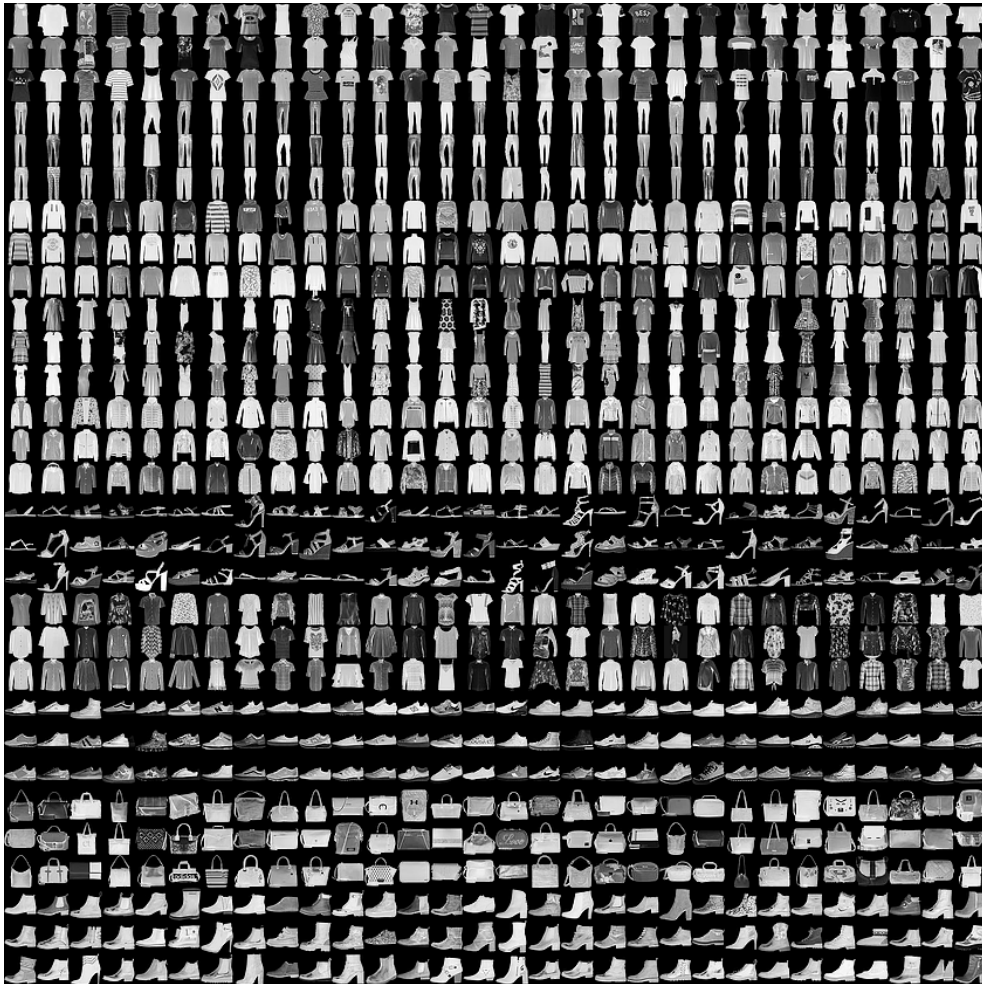


Fashion MNIST

Background Details & Objective



1 WHAT IS FASHION MNIST?

- Fashion images taken from Zalando
- 50,000 training examples and 10,000 testing
- 10 classes

2 OBJECTIVE

Prevent Overfitting

Exploratory Data Analysis

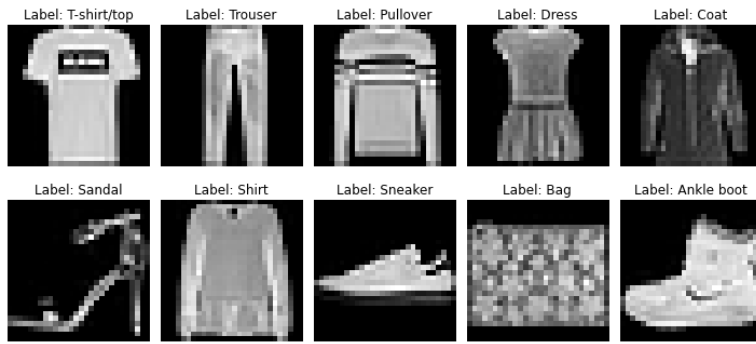
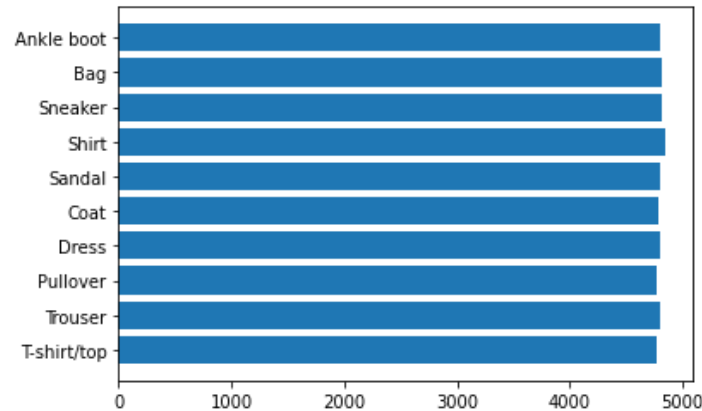


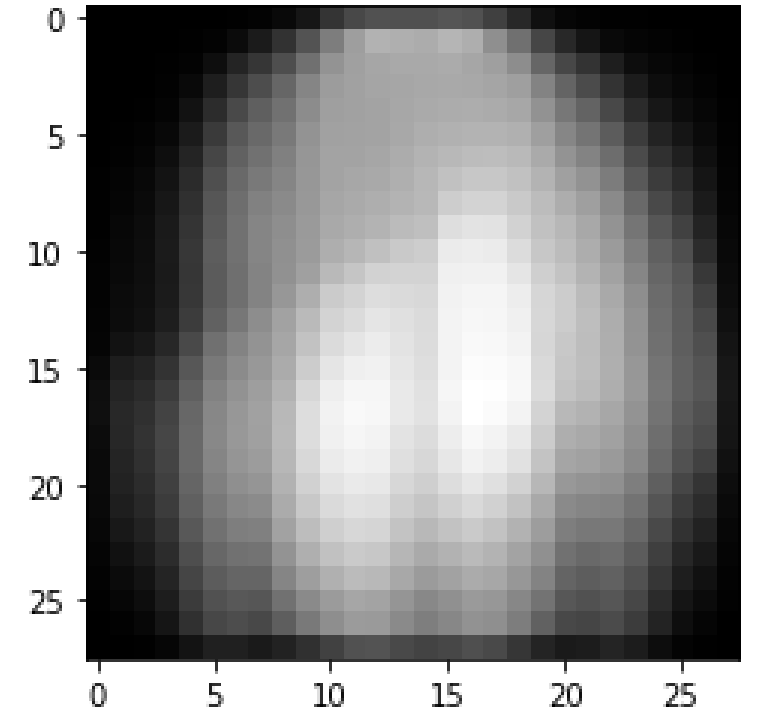
IMAGE FORMAT

28x28 Gray Scale Images. Pixel values between 0 and 255



EVEN CLASS DISTRIBUTION

Balanced classes means metrics like accuracy are suitable for evaluating the problem



WHAT DOES THE "AVERAGE" IMAGE LOOK LIKE?

Images in the Fashion MNIST dataset are very similar; Low variety



Pipeline

DATA SPLIT

Split into train,
validation and
testing set

40,000 Training

10,000 Validation

10,000 Testing

IMAGE NORMALIZATION

Images are
normalized to
improve training

DATA AUGMENTATION

To reduce
overfitting. Random
flips and random
crops with padding.

MODEL FITTING AND EVALUATION

Early stopping and
learning rate is
reduced on plateau.

Model Evaluation

LOSS & METRIC

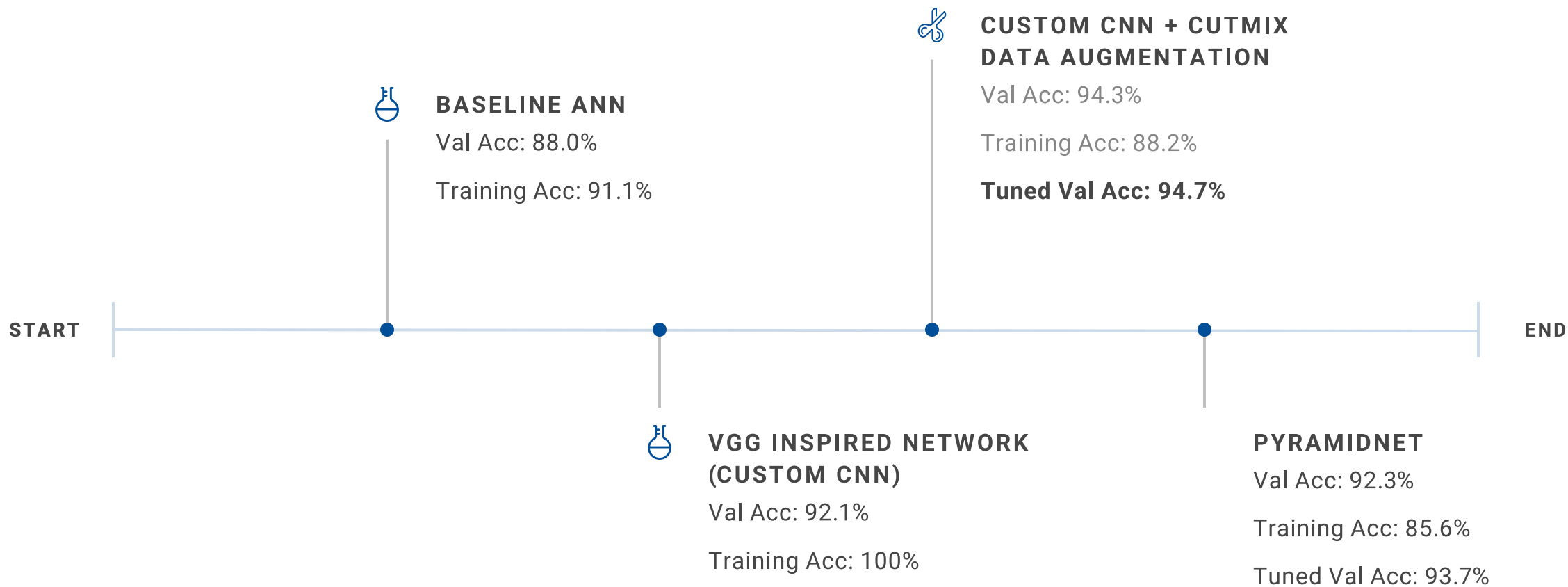
- Loss: Categorical Cross Entropy
- Metric: Accuracy

OPTIMIZER & LEARNING RATE

- SGD with Momentum
- Learning Rate: 0.01
- Momentum: 0.9
- Learning rate reduced on plateau

TRAINING

- Batch Size: 128
- Early stopping is applied



EXPERIMENTS

Conclusion

• TEST METRICS

- Accuracy: 94.77%
- Does better than real human performance on the dataset
- Does not overfit as it is very close to validation accuracy
- Helped mainly by CutMix data augmentation

• ERROR ANALYSIS

- Model performs worse on shirts (T-Shirts, Shirts, Coats, Dresses)
- Likely because shirts all have similar appearances when shown in a low resolution

