DNN report

10.05.2025

Train and test accuracy for different models:

MODEL	TRAIN ACCURACY	TEST ACCURACY
DENSEMODEL	85.54%	83.91%
DENSEMODEL2	88.64%	87.23%
CNN	91.48%	90.46%
CNN(IMPROVED)	93.25%	92.48%

Model architecture comparison:

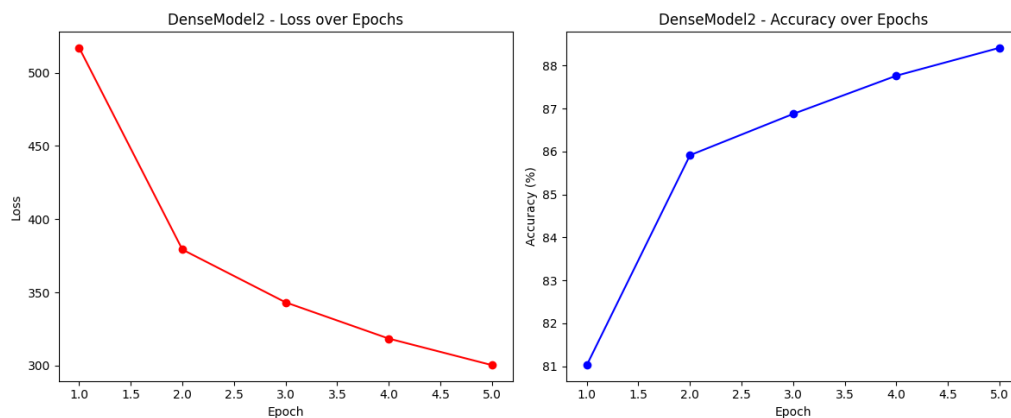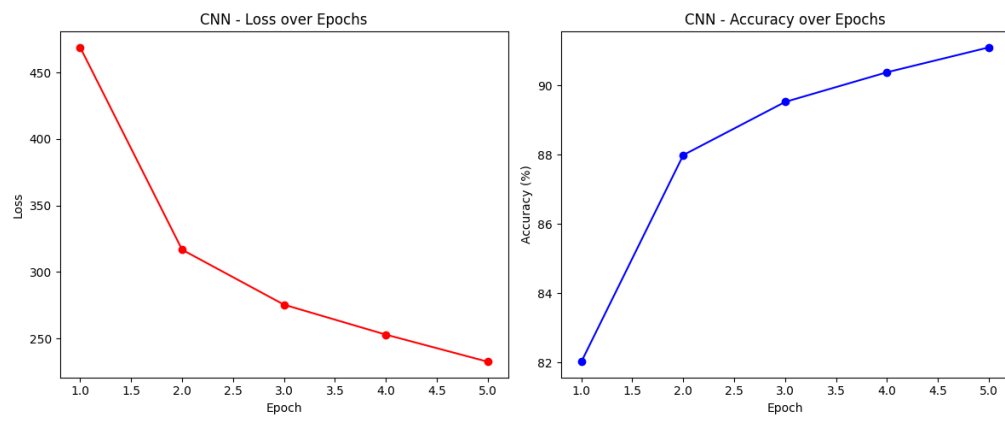| MODEL	LAYERS
DENSEMODEL	- Linear(784 → 10)
DENSEMODEL2	- Linear(784 → 128) - ReLU - Linear(128 → 10)
CNN	- Conv2d(1 → 16, 5x5, padding=2) - ReLU - MaxPool2d(2x2) - Conv2d(16 → 32, 5x5, padding=2) - ReLU - MaxPool2d(2x2) - Linear(1568 → 10)

CNNIMPROVED	**- Block 1:**
	  - Conv2d(1 → 32, 3x3, padding=1)
	  - BatchNorm2d(32)
	  - ReLU
	  - Conv2d(32 → 32, 3x3, padding=1)
	  - BatchNorm2d(32)
	  - ReLU
	  - MaxPool2d(2x2)
	
	- Block 2:
	  - Conv2d(32 → 64, 3x3, padding=1)
	  - BatchNorm2d(64)
	  - ReLU
	  - Conv2d(64 → 64, 3x3, padding=1)
	  - BatchNorm2d(64)
	  - ReLU
	  - MaxPool2d(2x2)
	
	- Block 3:
	  - Conv2d(64 → 128, 3x3, padding=1)
	  - BatchNorm2d(128)
	  - ReLU
	  - Conv2d(128 → 128, 3x3, padding=1)
	  - BatchNorm2d(128)
	  - ReLU
	  - MaxPool2d(2x2)
	
	- Classifier:
	  - Dropout(0.4)
	  - Flatten
	  - Linear(1152 → 256)
	  - ReLU
	  - Dropout(0.4)
	  - Linear(256 → 10)

Grid of images

Coat	Ankle boot	Sandal	T-shirt/top	Trouser	Shirt
Sneaker	Bag	Sandal	Shirt	T-shirt/top	Trouser
Shirt	Shirt	Shirt	T-shirt/top	Trouser	Sneaker
Pullover	Pullover	Sandal	Bag	Dress	Bag
Dress	Sneaker	Pullover	Pullover	Sneaker	T-shirt/top
Bag	Shirt	Sandal	Shirt	Sandal	Bag

Plots for DenseModel

DenseModel - Loss over Epochs

DenseModel - Accuracy over Epochs

Plots for DenseModel2

DenseModel2 - Loss over Epochs

DenseModel2 - Accuracy over Epochs
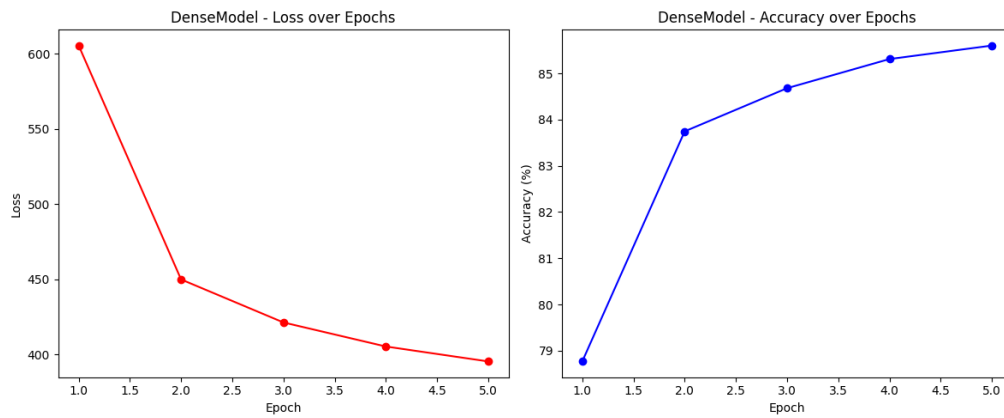
Plots for CNN

Plots for CNNImpoved