

Practical-02

MNIST Digit Recognition using CNN (Client Side)

TensorFlow.js loaded using jsDelivr CDN | Training: 5 Epochs

1) Train & Test Model

Train Model (5 Epochs) Test Accuracy

Status: Training started...

2) Draw Digit & Predict



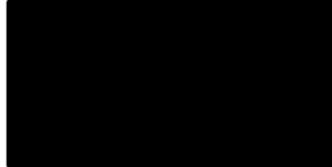
Clear Predict

Prediction: -

Logs / Output

```
loading MNIST dataset...
Building CNN model...
Training started (5 epochs)...
```

Visualization



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1) Train & Test Model

Train Model (5 Epochs) Test Accuracy

Status: Training complete ✓

2) Draw Digit & Predict



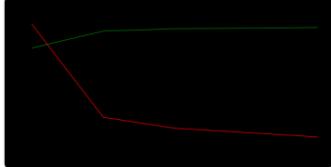
Clear Predict

Prediction: 1

Logs / Output

```
loading MNIST dataset...
Building CNN model...
Training started (5 epochs)...
Epoch 1 => loss=0.5954, acc=81.72%
Epoch 2 => loss=0.1700, acc=94.74%
Epoch 3 => loss=0.1100, acc=96.53%
Epoch 4 => loss=0.1000, acc=96.97%
Epoch 5 => loss=0.0797, acc=97.49%
Training completed successfully ✅
Predicted Digit: 1
```

Visualization



Console

```
flatten_Flatten1 (Flatten) [[null,5,5,64]] [null,1600] layer_utils.js:152
dense_Dense1 (Dense) [[null,1600]] 204928 layer_utils.js:74
dropout_Dropout1 (Dropout) [[null,128]] [null,128] layer_utils.js:152
dense_Dense2 (Dense) [[null,128]] [null,10] 1290 layer_utils.js:152
=====
Total params: 225034 layer_utils.js:83
Trainable params: 225034 layer_utils.js:84
Non-trainable params: 0 layer_utils.js:85
layer_utils.js:86
=====
Training started (5 epochs)...
digit_recognition.html:91
Epoch 1 => loss=0.5954, acc=81.72% digit_recognition.html:91
Epoch 2 => loss=0.1700, acc=94.74% digit_recognition.html:91
Epoch 3 => loss=0.1100, acc=96.51% digit_recognition.html:91
[ENR] Explain Console errors by using Copilot in Edge: click ⓘ to explain an error. learn more
Epoch 4 => loss=0.1000, acc=96.97% digit_recognition.html:91
Epoch 5 => loss=0.0797, acc=97.49% digit_recognition.html:91
Training completed successfully ✅ digit_recognition.html:91
Predicted Digit: 1 digit_recognition.html:91
```

Air: Satisfactory Friday

MNIST Digit Recognition using CNN (Client Side)

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1) Train & Test Model

Train Model (5 Epochs) Test Accuracy

Status: Testing complete

2) Draw Digit & Predict



Clear Predict

Prediction: 4

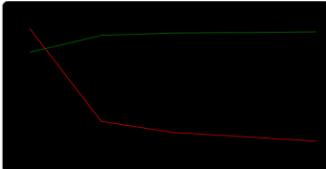
Logs / Output

```

Training started (5 epochs)...
epoch 1 => loss=0.5954, acc=81.72%
epoch 2 => loss=0.3790, acc=94.74%
epoch 3 => loss=0.1653, acc=96.97%
epoch 4 => loss=0.1060, acc=96.97%
epoch 5 => loss=0.0797, acc=97.40%
Training completed successfully
Predicted Digit: 3
Canvas cleared.
predicted Digit: 0
Canvas cleared.
predicted Digit: 3
Canvas cleared.
predicted Digit: 4
Canvas cleared.
predicted Digit: 4
Canvas cleared.
Final Test Accuracy: 98.40%

```

Visualization



Console Issues +

Total params: 225034 layer_utils.js:83
Trainable params: 225034 layer_utils.js:84
Non-trainable params: 0 layer_utils.js:85
layer_utils.js:86

Training started (5 epochs)... digit_recognition.html:91
Epoch 1 => loss=0.5954, acc=81.72% digit_recognition.html:91
Epoch 2 => loss=0.1700, acc=94.74% digit_recognition.html:91
Epoch 3 => loss=0.1195, acc=96.51% digit_recognition.html:91
[NEW] Explain Console errors by using Copilot in Edge: click ⓘ to explain an error. Learn more Don't show again
Epoch 4 => loss=0.1000, acc=96.97% digit_recognition.html:91
Epoch 5 => loss=0.0797, acc=97.40% digit_recognition.html:91
Training completed successfully digit_recognition.html:91
Predicted Digit: 1 digit_recognition.html:91
Canvas cleared. digit_recognition.html:91
⚠️ Canvas2D: Multiple readback operations using getImageData are faster with the willReadFrequently attribute set to true. See: https://html.spec.whatwg.org/multipage/canvas.html#concept-canvas-will-read-frequently digit_recognition.html:458 ⓘ
Predicted Digit: 0 digit_recognition.html:91
Canvas cleared. digit_recognition.html:91
Predicted Digit: 3 digit_recognition.html:91
Canvas cleared. digit_recognition.html:91
Predicted Digit: 4 digit_recognition.html:91
Canvas cleared. digit_recognition.html:91
Predicted Digit: 4 digit_recognition.html:91
Testing started... digit_recognition.html:91
Final Test Accuracy: 98.46% digit_recognition.html:91