C:\Newproject12\scripts>python train\_model.py

2025-05-22 19:31:55,888 - INFO - Using device: cuda

2025-05-22 19:31:55,888 - INFO - Loading datasets...

2025-05-22 19:31:55,968 - INFO - Loaded dataset from C:\Newproject12\data\train.csv with 33878 samples

2025-05-22 19:31:56,015 - INFO - Loaded dataset from C:\Newproject12\data\val.csv with 7259 samples

2025-05-22 19:31:56,047 - INFO - Loaded dataset from C:\Newproject12\data\test.csv with 7261 samples

2025-05-22 19:31:56,047 - INFO - Initializing model...

2025-05-22 19:31:56,412 - INFO - Starting training...

2025-05-22 19:34:28,731 - INFO -

Epoch 1/50

2025-05-22 19:34:28,731 - INFO - Train Loss: 0.3127, Train Accuracy: 0.8345

2025-05-22 19:34:28,731 - INFO - Val Loss: 0.1988, Val Accuracy: 0.8539

2025-05-22 19:34:28,842 - INFO - Model saved.

2025-05-22 19:37:00,297 - INFO -

Epoch 2/50

2025-05-22 19:37:00,297 - INFO - Train Loss: 0.1661, Train Accuracy: 0.8637

2025-05-22 19:37:00,297 - INFO - Val Loss: 0.1906, Val Accuracy: 0.8634

2025-05-22 19:37:00,409 - INFO - Model saved.

2025-05-22 19:39:32,510 - INFO -

Epoch 3/50

2025-05-22 19:39:32,518 - INFO - Train Loss: 0.1256, Train Accuracy: 0.8721

2025-05-22 19:39:32,518 - INFO - Val Loss: 0.1259, Val Accuracy: 0.8702

2025-05-22 19:39:32,616 - INFO - Model saved.

2025-05-22 19:41:57,283 - INFO -

Epoch 4/50

2025-05-22 19:41:57,283 - INFO - Train Loss: 0.1062, Train Accuracy: 0.8762

2025-05-22 19:41:57,283 - INFO - Val Loss: 0.1161, Val Accuracy: 0.8686

2025-05-22 19:41:57,357 - INFO - Model saved.

2025-05-22 19:44:20,879 - INFO -

Epoch 5/50

2025-05-22 19:44:20,879 - INFO - Train Loss: 0.0977, Train Accuracy: 0.8775

2025-05-22 19:44:20,879 - INFO - Val Loss: 0.0949, Val Accuracy: 0.8718

2025-05-22 19:44:20,952 - INFO - Model saved.

2025-05-22 19:46:54,909 - INFO -

Epoch 6/50

2025-05-22 19:46:54,909 - INFO - Train Loss: 0.0870, Train Accuracy: 0.8784

2025-05-22 19:46:54,909 - INFO - Val Loss: 0.1064, Val Accuracy: 0.8783

2025-05-22 19:49:26,688 - INFO -

Epoch 7/50

2025-05-22 19:49:26,688 - INFO - Train Loss: 0.0752, Train Accuracy: 0.8803

2025-05-22 19:49:26,688 - INFO - Val Loss: 0.0696, Val Accuracy: 0.8779

2025-05-22 19:49:26,783 - INFO - Model saved.

2025-05-22 19:51:57,464 - INFO -

Epoch 8/50

2025-05-22 19:51:57,464 - INFO - Train Loss: 0.0733, Train Accuracy: 0.8798

2025-05-22 19:51:57,464 - INFO - Val Loss: 0.0877, Val Accuracy: 0.8732

2025-05-22 19:54:30,195 - INFO -

Epoch 9/50

2025-05-22 19:54:30,195 - INFO - Train Loss: 0.0675, Train Accuracy: 0.8814

2025-05-22 19:54:30,195 - INFO - Val Loss: 0.0916, Val Accuracy: 0.8791

2025-05-22 19:57:03,476 - INFO -

Epoch 10/50

2025-05-22 19:57:03,476 - INFO - Train Loss: 0.0643, Train Accuracy: 0.8808

2025-05-22 19:57:03,476 - INFO - Val Loss: 0.0765, Val Accuracy: 0.8801

2025-05-22 19:59:28,834 - INFO -

Epoch 11/50

2025-05-22 19:59:28,834 - INFO - Train Loss: 0.0594, Train Accuracy: 0.8816

2025-05-22 19:59:28,834 - INFO - Val Loss: 0.0667, Val Accuracy: 0.8786

2025-05-22 19:59:28,918 - INFO - Model saved.

2025-05-22 20:02:00,327 - INFO -

Epoch 12/50

2025-05-22 20:02:00,327 - INFO - Train Loss: 0.0567, Train Accuracy: 0.8822

2025-05-22 20:02:00,327 - INFO - Val Loss: 0.0702, Val Accuracy: 0.8781

2025-05-22 20:04:32,290 - INFO -

Epoch 13/50

2025-05-22 20:04:32,290 - INFO - Train Loss: 0.0554, Train Accuracy: 0.8820

2025-05-22 20:04:32,290 - INFO - Val Loss: 0.0751, Val Accuracy: 0.8786

2025-05-22 20:07:03,086 - INFO -

Epoch 14/50

2025-05-22 20:07:03,086 - INFO - Train Loss: 0.0528, Train Accuracy: 0.8815

2025-05-22 20:07:03,086 - INFO - Val Loss: 0.0942, Val Accuracy: 0.8772

2025-05-22 20:09:28,829 - INFO -

Epoch 15/50

2025-05-22 20:09:28,829 - INFO - Train Loss: 0.0532, Train Accuracy: 0.8822

2025-05-22 20:09:28,829 - INFO - Val Loss: 0.0632, Val Accuracy: 0.8796

2025-05-22 20:09:28,909 - INFO - Model saved.

2025-05-22 20:12:00,597 - INFO -

Epoch 16/50

2025-05-22 20:12:00,597 - INFO - Train Loss: 0.0495, Train Accuracy: 0.8826

2025-05-22 20:12:00,597 - INFO - Val Loss: 0.0588, Val Accuracy: 0.8785

2025-05-22 20:12:00,693 - INFO - Model saved.

2025-05-22 20:14:30,310 - INFO -

Epoch 17/50

2025-05-22 20:14:30,310 - INFO - Train Loss: 0.0493, Train Accuracy: 0.8834

2025-05-22 20:14:30,310 - INFO - Val Loss: 0.0494, Val Accuracy: 0.8799

2025-05-22 20:14:30,405 - INFO - Model saved.

2025-05-22 20:17:01,996 - INFO -

Epoch 18/50

2025-05-22 20:17:01,996 - INFO - Train Loss: 0.0465, Train Accuracy: 0.8829

2025-05-22 20:17:01,996 - INFO - Val Loss: 0.0707, Val Accuracy: 0.8801

2025-05-22 20:19:32,498 - INFO -

Epoch 19/50

2025-05-22 20:19:32,498 - INFO - Train Loss: 0.0476, Train Accuracy: 0.8826

2025-05-22 20:19:32,498 - INFO - Val Loss: 0.0519, Val Accuracy: 0.8801

2025-05-22 20:21:59,170 - INFO -

Epoch 20/50

2025-05-22 20:21:59,170 - INFO - Train Loss: 0.0427, Train Accuracy: 0.8839

2025-05-22 20:21:59,170 - INFO - Val Loss: 0.0487, Val Accuracy: 0.8793

2025-05-22 20:21:59,297 - INFO - Model saved.

2025-05-22 20:24:28,778 - INFO -

Epoch 21/50

2025-05-22 20:24:28,778 - INFO - Train Loss: 0.0422, Train Accuracy: 0.8833

2025-05-22 20:24:28,778 - INFO - Val Loss: 0.0623, Val Accuracy: 0.8808

2025-05-22 20:26:58,752 - INFO -

Epoch 22/50

2025-05-22 20:26:58,752 - INFO - Train Loss: 0.0399, Train Accuracy: 0.8839

2025-05-22 20:26:58,752 - INFO - Val Loss: 0.0665, Val Accuracy: 0.8789

2025-05-22 20:29:28,374 - INFO -

Epoch 23/50

2025-05-22 20:29:28,374 - INFO - Train Loss: 0.0408, Train Accuracy: 0.8838

2025-05-22 20:29:28,374 - INFO - Val Loss: 0.0701, Val Accuracy: 0.8776

2025-05-22 20:31:53,138 - INFO -

Epoch 24/50

2025-05-22 20:31:53,138 - INFO - Train Loss: 0.0420, Train Accuracy: 0.8841

2025-05-22 20:31:53,138 - INFO - Val Loss: 0.0547, Val Accuracy: 0.8793

2025-05-22 20:34:21,872 - INFO -

Epoch 25/50

2025-05-22 20:34:21,872 - INFO - Train Loss: 0.0389, Train Accuracy: 0.8844

2025-05-22 20:34:21,872 - INFO - Val Loss: 0.0458, Val Accuracy: 0.8790

2025-05-22 20:34:21,983 - INFO - Model saved.

2025-05-22 20:36:50,931 - INFO -

Epoch 26/50

2025-05-22 20:36:50,931 - INFO - Train Loss: 0.0384, Train Accuracy: 0.8842

2025-05-22 20:36:50,931 - INFO - Val Loss: 0.0518, Val Accuracy: 0.8807

2025-05-22 20:39:18,167 - INFO -

Epoch 27/50

2025-05-22 20:39:18,167 - INFO - Train Loss: 0.0358, Train Accuracy: 0.8844

2025-05-22 20:39:18,167 - INFO - Val Loss: 0.0542, Val Accuracy: 0.8750

2025-05-22 20:41:46,433 - INFO -

Epoch 28/50

2025-05-22 20:41:46,433 - INFO - Train Loss: 0.0384, Train Accuracy: 0.8837

2025-05-22 20:41:46,433 - INFO - Val Loss: 0.0440, Val Accuracy: 0.8830

2025-05-22 20:41:46,530 - INFO - Model saved.

2025-05-22 20:44:14,608 - INFO -

Epoch 29/50

2025-05-22 20:44:14,608 - INFO - Train Loss: 0.0370, Train Accuracy: 0.8846

2025-05-22 20:44:14,608 - INFO - Val Loss: 0.0503, Val Accuracy: 0.8785

2025-05-22 20:46:32,921 - INFO -

Epoch 30/50

2025-05-22 20:46:32,921 - INFO - Train Loss: 0.0359, Train Accuracy: 0.8847

2025-05-22 20:46:32,921 - INFO - Val Loss: 0.0589, Val Accuracy: 0.8815

2025-05-22 20:49:01,604 - INFO -

Epoch 31/50

2025-05-22 20:49:01,604 - INFO - Train Loss: 0.0356, Train Accuracy: 0.8851

2025-05-22 20:49:01,604 - INFO - Val Loss: 0.0562, Val Accuracy: 0.8800

2025-05-22 20:51:29,833 - INFO -

Epoch 32/50

2025-05-22 20:51:29,833 - INFO - Train Loss: 0.0352, Train Accuracy: 0.8846

2025-05-22 20:51:29,833 - INFO - Val Loss: 0.0590, Val Accuracy: 0.8797

2025-05-22 20:53:58,884 - INFO -

Epoch 33/50

2025-05-22 20:53:58,884 - INFO - Train Loss: 0.0325, Train Accuracy: 0.8846

2025-05-22 20:53:58,884 - INFO - Val Loss: 0.0461, Val Accuracy: 0.8823

2025-05-22 20:53:58,884 - INFO - Early stopping triggered.

2025-05-22 20:53:58,884 - INFO -

Evaluating on test set...

2025-05-22 20:54:36,789 - INFO -

Final Test Results:

2025-05-22 20:54:36,794 - INFO - Accuracy: 0.8778

2025-05-22 20:54:36,798 - INFO -

Confusion Matrix:

2025-05-22 20:54:36,798 - INFO - [[5993 26 0 0 0 0 0 0 0 0 0 0 0 0]

[ 15 381 0 0 0 0 0 0 0 0 0 0 0 0]

[ 16 348 0 0 0 0 0 0 0 0 0 0 0 0]

[ 2 203 0 0 0 0 0 0 0 0 0 0 0 0]

[ 1 124 0 0 0 0 0 0 0 0 0 0 0 0]

[ 1 38 0 0 0 0 0 0 0 0 0 0 0 0]

[ 1 45 0 0 0 0 0 0 0 0 0 0 0 0]

[ 0 10 0 0 0 0 0 0 0 0 0 0 0 0]

[ 2 14 0 0 0 0 0 0 0 0 0 0 0 0]

[ 0 4 0 0 0 0 0 0 0 0 0 0 0 0]

[ 0 14 0 0 0 0 0 0 0 0 0 0 0 0]

[ 0 14 0 0 0 0 0 0 0 0 0 0 0 0]

[ 0 4 0 0 0 0 0 0 0 0 0 0 0 0]

[ 0 5 0 0 0 0 0 0 0 0 0 0 0 0]]

2025-05-22 20:54:37,652 - INFO -

Classification Report:

C:\Users\UDA\AppData\Local\Programs\Python\Python310\lib\site-packages\sklearn\metrics\\_classification.py:1565: UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

\_warn\_prf(average, modifier, f"{metric.capitalize()} is", len(result))

C:\Users\UDA\AppData\Local\Programs\Python\Python310\lib\site-packages\sklearn\metrics\\_classification.py:1565: UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

\_warn\_prf(average, modifier, f"{metric.capitalize()} is", len(result))

C:\Users\UDA\AppData\Local\Programs\Python\Python310\lib\site-packages\sklearn\metrics\\_classification.py:1565: UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

\_warn\_prf(average, modifier, f"{metric.capitalize()} is", len(result))

2025-05-22 20:54:37,700 - INFO - precision recall f1-score support

0.0 0.99 1.00 0.99 6019

1.0 0.31 0.96 0.47 396

2.0 0.00 0.00 0.00 364

3.0 0.00 0.00 0.00 205

4.0 0.00 0.00 0.00 125

5.0 0.00 0.00 0.00 39

6.0 0.00 0.00 0.00 46

7.0 0.00 0.00 0.00 10

8.0 0.00 0.00 0.00 16

9.0 0.00 0.00 0.00 4

10.0 0.00 0.00 0.00 14

11.0 0.00 0.00 0.00 14

12.0 0.00 0.00 0.00 4

13.0 0.00 0.00 0.00 5

accuracy 0.88 7261

macro avg 0.09 0.14 0.10 7261

weighted avg 0.84 0.88 0.85 7261

2025-05-22 20:54:38,098 - INFO -

Training complete!

2025-05-22 20:54:38,098 - INFO - Best validation MAE: 0.0440

2025-05-22 20:54:38,098 - INFO - Training history plot saved as 'training\_history.png'

2025-05-22 20:54:38,098 - INFO - Confusion matrix plot saved as 'confusion\_matrix.png'

