Using device: CUDA

Task execution time: 951.96 seconds

Completed Tasks:

Task 1.1: Load CIFAR-10 Dataset ✓

Task 1.2: Visualize CIFAR-10 Samples ✓

Task 1.3: Convert to Grayscale ✓

Task 2.1: Extract SIFT Features ✓

Task 2.2: Visualize SIFT Keypoints ✓

Task 3.1: Generate Codebook ✓

Task 3.2: Create BoVW Histograms ✓

Task 4.1: Train SVM Classifier ✓

Task 4.2: Train CNN Classifier ✓

Task 5.1: Compare SVM and CNN ✓

Reset (Clear Task)

CIFAR-10 Image Classification with BoVW and CNN

This application implements image classification on the CIFAR-10 dataset using:

- Bag of Visual Words (BoVW) model with SVM classifier
- Deep Learning approach with ResNet-18 CNN
- Data augmentation techniques

Follow the tasks step by step using the dropdown menu.

Select a task to run:

Task 4.2: Train CNN Classifier

Run Task

Task 4.2: Train CNN Classifier

Number of epochs

5

1 20

Batch size

64

Learning rate

0.010

0.001 0.100

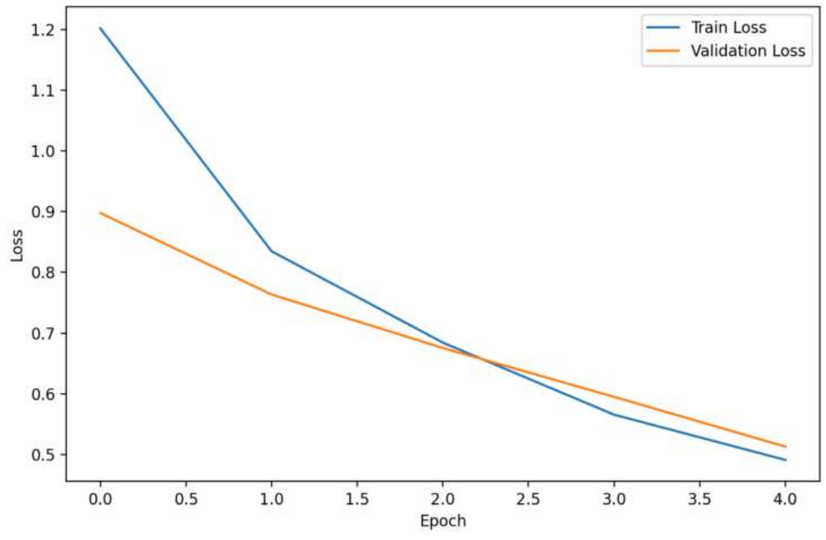
CNN Classification Results

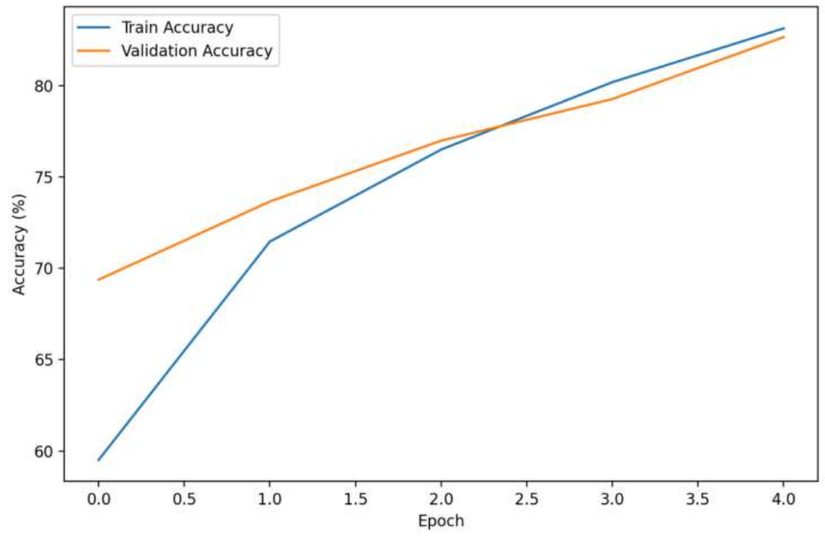
Accuracy: 0.8323

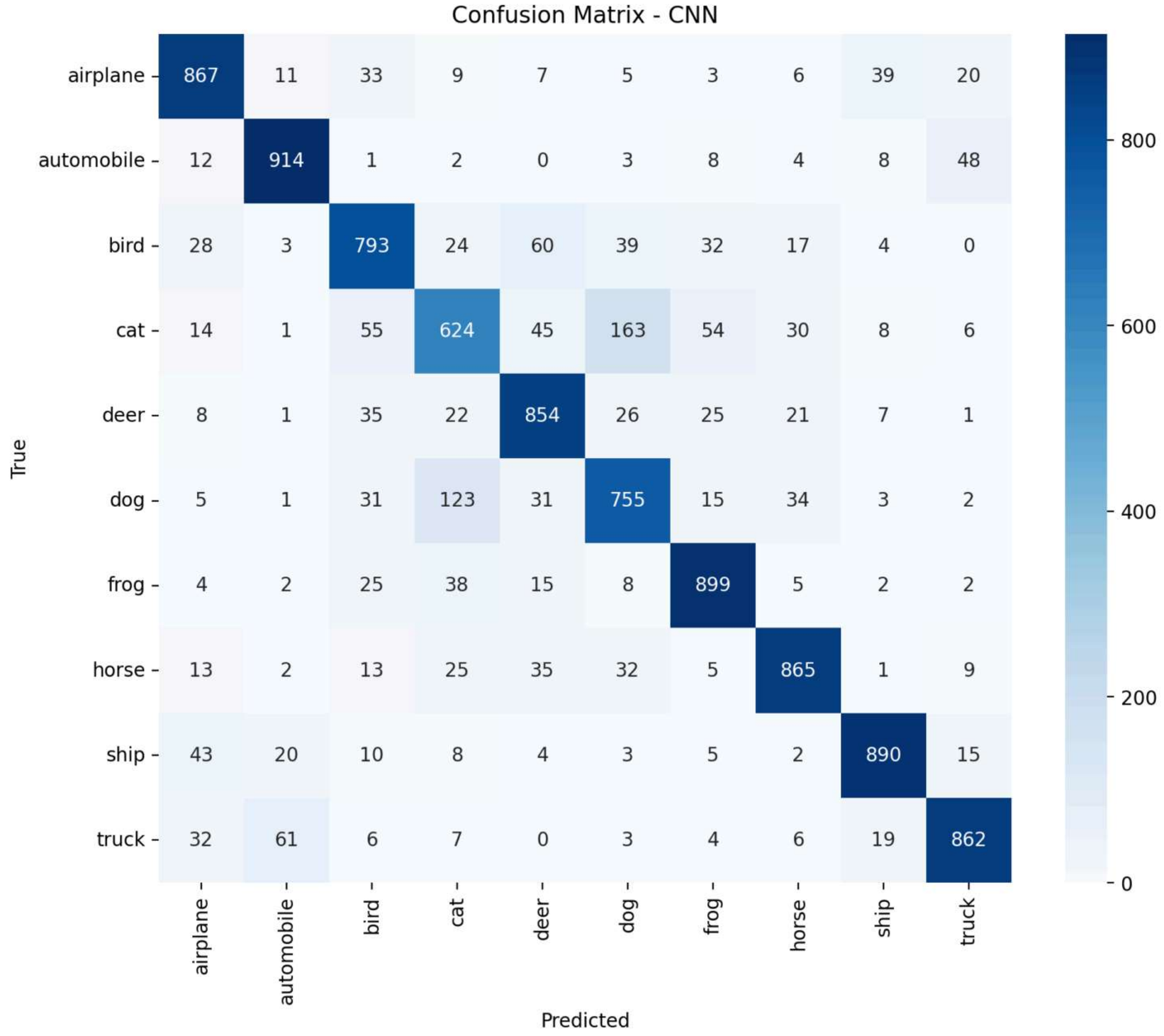
Precision: 0.8315

Recall: 0.8323

F1-Score: 0.8314


Train Loss
Validation Loss
Loss
Epoch
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0


Train Accuracy
Validation Accuracy
Accuracy (%)
Epoch
80
75
70
65
60
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0



CNN classifier trained successfully!