Vision AI in 5 Days:

From Beginner to Image Recognition Expert

A Project Submission by ~ SAYON GHOSH

Project Objective

The core goal of this project was to build and evaluate two distinct Convolutional Neural Network (CNN) models for the task of handwritten digit recognition using the classic MNIST dataset. The aim was to compare a custom-built model against a powerful pre-trained model.

Methodology & Tools Used

Custom CNN Model

A sequential CNN was built from scratch using TensorFlow/Keras. It featured two convolutional layers and utilized data augmentation techniques like rotation and zoom to improve robustness.

Transfer Learning Model

The pre-trained MobileNetV2 model was adapted for this task. The convolutional base was frozen, and a new classification head was added and fine-tuned on the MNIST data.

Key Tools: Python, Google Colab, TensorFlow, Scikit-learn.

Performance Results

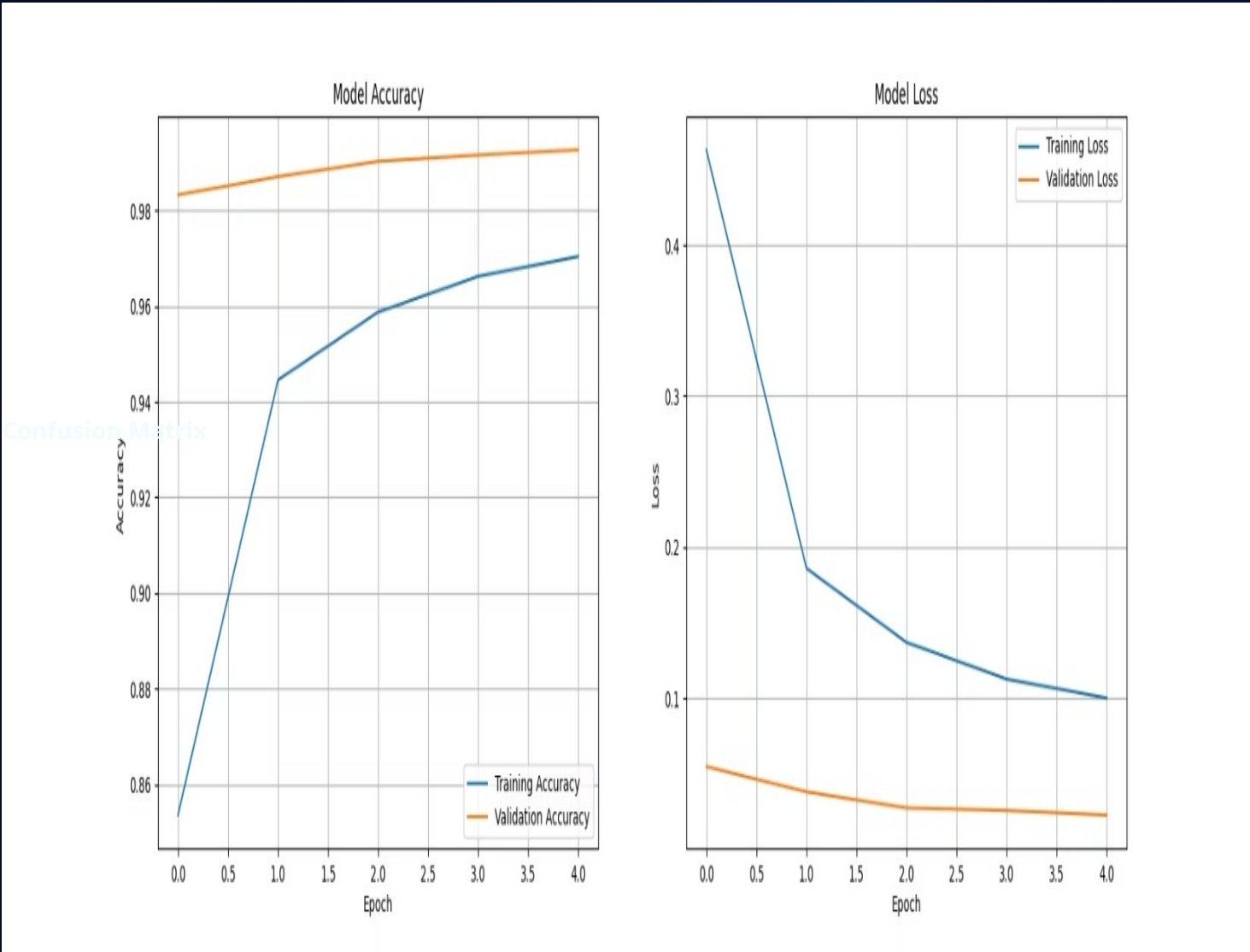Display the final test accuracies of both models side-by-side for comparison.
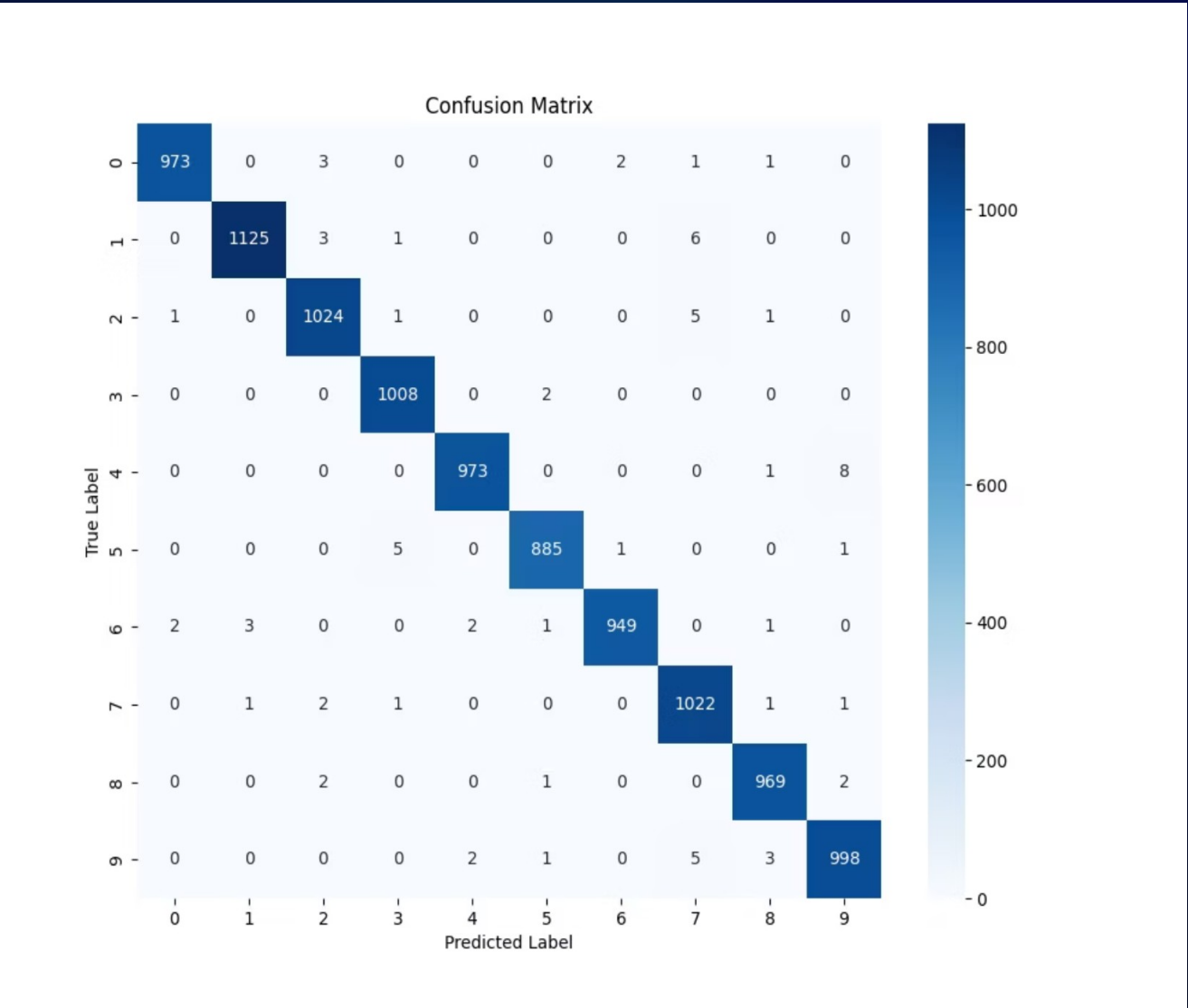
99.26%

Custom CNN Accuracy

96.99%

Transfer Learning (MobileNetV2) Accuracy

Training & Loss Curves

Confusion Matrix

Conclusion & Future Work

The custom CNN achieved exceptionally high accuracy, proving effective for the simple MNIST dataset. The transfer learning model also performed well and demonstrates a powerful approach for more complex, real-world image classificati

Future Work:

- Suggestions include further fine-tuning of hyperparameters or applying these models to more challenging datasets like CIFAR-10.