Reading: Assignment Overview: Comparing ViTs: Keras versus PyTorch

Estimated reading time: 2 minutes

Introduction

In this lab, you will evaluate and compare hybrid Convolutional Neural Network–Vision Transformer (CNN–ViT) models for land classification, using both PyTorch and Keras implementations.

Let's go through the overview of steps and tasks that you will perform during this lab:

Steps and tasks

1. You will begin by downloading and preparing the data through cleaning and normalization. Both frameworks are used to instantiate pre-trained CNN-ViT hybrid models, which are loaded and evaluated on the provided dataset.
2. You will set consistent hyperparameters and preprocess input data to ensure fair cross-framework comparisons. The lab guides you through running inferences, obtaining predictions, and evaluating model performance using metrics like accuracy, precision, recall, and F1-score.
3. Your first exercise will be to define the dataset and model hyperparameters. The model architecture and hyperparameters are based on the pre-trained model architecture.
4. In the next exercise, you will instantiate a PyTorch model for evaluation.
5. Next, you will move to the Keras framework and instantiate the Keras-based model.
6. Your next task will be to get the evaluation metrics of the Keras-based CNN-ViT hybrid model.
7. Similarly, you will generate evaluation metrics for the PyTorch-based model in your future task.
8. At the end, you will compare various performance metrics, such as accuracy, Precision, recall, F1-score, and the ROC-AUC, in a tabular format.
9. By completing this lab, you will gain knowledge on implementing customized pre-trained models using either the Keras or PyTorch framework and a deep understanding of the performance metrics for fair evaluation of these models.
10. After completing this lab, you will need to download and save it on your computer for final submission and evaluation at the end of this course. Good luck, and let's get started.