Reading: Assignment Overview: Keras-Based Agricultural Land Classifier

Estimated time: 2 minutes

Welcome to this hands-on lab where you'll build, train, and evaluate a convolutional neural network (CNN) using Keras for agricultural land classification. In this lab, you will create a complete machine learning pipeline, from data preparation to model evaluation using Keras framework.

By completing this lab, you will:

1. Create a Keras-based convolutional neural network (CNN) model
2. Train the CNN model on agricultural and non-agricultural land dataset
3. Evaluate the performance of the CNN model

Throughout this lab, you will be performing various tasks and exercises, including:

1. **File discovery and path management:** You'll use Python's os.walk() function to recursively traverse the dataset directory and create a comprehensive list of all image files. This task teaches you about file system navigation and path handling, which are essential skills for data preprocessing in machine learning projects.
2. **Data generator creation:** Similar to the provided training data generator, you'll create a validation data generator using Keras' "ImageDataGenerator" utility. This task will help you understand the key differences between training and validation data generator.
3. **Designing custom convolutional neural network:** Here, you will design and compile your own CNN model with specific architectural constraints for your domain-specific dataset. This will help you understand how different layers contribute to feature extraction and classification.
4. **Model checkpoint configuration:** Next, you'll configure a model checkpoint callback to save the best performing model during training. Model checkpointing prevents loss of training progress and ensures you retain the best performing model version.
5. **Training visualization:** The final task will be to create visualizations of different metrics to understand model performance during training. These metrics help identify overfitting, underfitting, and optimal training duration.

This comprehensive lab provides hands-on experience with every aspect of building and training deep learning models for image classification, preparing you for real-world machine learning projects using Keras framework. By the end of this lab, you will know how to create your own CNN in Keras for your dataset.

You will need to download and save the finished lab on your computer for final evaluation at the end of this course. Good luck!