optimizer_params.py

Summary

This code defines classes for managing hyperparameter configurations in optimization tasks.

Dependencies

Standard Library

- None

Other

- optuna

Description

The `optimizer_params.py` file contains classes designed to handle hyperparameter configurations for optimization tasks, particularly for machine learning models. The main class is `OptimizerParams`, which defines hyperparameter ranges and provides methods to generate suggestions for Optuna trials.

The `OptimizerParams` class defines a set of hyperparameters and their respective ranges or possible values in the `hyperparams_grid` class attribute. These hyperparameters are typically used in tree-based models, such as XGBoost. The grid includes parameters like learning rate (`eta`), regularization parameters (`reg_alpha`, `reg_lambda`), tree-specific parameters (`max_depth`, `n_estimators`), and various sampling parameters.

The class provides a method `get_trial_values` that takes an Optuna `Trial` object as input and returns a dictionary of suggested hyperparameter values. This method dynamically generates parameter suggestions based on the type and range defined in the `hyperparams_grid`. It supports float, integer, and categorical parameters, making it flexible for various hyperparameter types.

The file also includes a subclass `BalancedParams` which extends `OptimizerParams` with a more focused set of hyperparameters. This subclass specifically targets regularization factors for tree models, with a smaller selection of hyperparameters but wider ranges for regularization parameters.

This implementation allows for easy integration with Optuna's optimization process, enabling efficient hyperparameter tuning for machine learning models.