Low-Level Design

Vehicle Number PLate Detection

Introduction

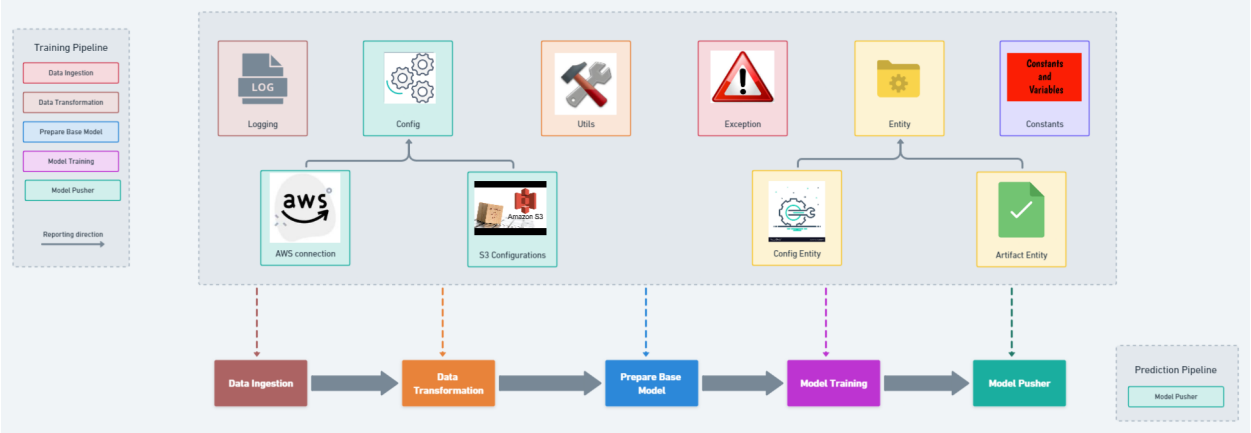
1.1 What is a Low-Level Design Document.

The goal of LLD or a low-level design document (LLDD) is to give the internal logical design of the actual program code for **'VEHICLE NUMBER PLATE DETECTION"**. LLD describes the class diagrams with the methods and relations between classes and program specs. It describes the modules so that the programmer can directly code the program from the document.

1.2 Scope

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. This process can be used for designing data structures, required software architecture, source code, and ultimately, performance algorithms. Overall, the data organization may be defined during requirement analysis and then refined during data design work.

Architecture :



2. Architecture Description

2.1 Data Description

The data is in the image format with annotation files.

2.2 Data Gathering

Data source:
https://www.kaggle.com/datasets/aslanahmedov/number-plate-detection

2.3 Data Collection

Gather a diverse dataset of vehicle images with labeled number plate regions for training the deep learning model.

2.4 Data Preprocessing

Resize and normalize the images, and extract the number plate regions to create input samples for the model.

2.5 Model Selection

Choose a suitable deep learning architecture for object detection tasks.

2.6 Model Training

Train the selected deep learning model on the prepared dataset using a large number of epochs to optimize its performance.

2.7 Validation

Evaluate the trained model on a separate validation dataset to measure its accuracy and fine-tune the hyperparameters if necessary.

2.8 Testing

Test the model on unseen images to assess its real-world performance and ensure robustness..

2.9 Integration

Integrate the trained model into the desired application or system to perform real-time number plate detection.

2.10 Model Saving

Model is saved using pickle library.

2.11 GitHub

The whole project directory will be pushed into the GitHub repository.

2.12 Deployment

The cloud environment was set up and the project was deployed in AWS.