DLOPS: LAB POJECT

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Abstract

This project involves training a Lenet model on the MNIST dataset using the Wandb library for monitoring and visualizing the training process. The model is trained to classify handwritten digits with high accuracy. Once the training is completed, the model is deployed on the Hugging Face platform, which provides a simple and user-friendly interface for deploying machine learning models. The deployed model can be used for real-time inference on new images of handwritten digits. Overall, this project demonstrates the use of deep learning techniques, monitoring libraries, and deployment platforms for developing and deploying machine learning models.

INTRODUCTION

This project focuses on the development and deployment of a deep learning model for handwritten digit classification. Handwritten digit recognition is a common problem in image classification, and the MNIST dataset is a popular benchmark dataset for this task. In this project, a Lenet model is trained on the MNIST dataset using the Wandb library for training monitoring. The trained model is then deployed on the Hugging Face platform, which provides a simple and user-friendly interface for deploying machine learning models. The deployed model can be used for real-time inference on new images of handwritten digits. The project demonstrates the use of deep learning techniques and deployment platforms for developing and deploying machine learning models.

Method & Work Done

1. Data Preparation: The MNIST dataset is used for training the Lenet model. The dataset contains 60,000 training images and 10,000 test images of handwritten digits. The dataset is preprocessed to normalize the pixel values and convert the images to grayscale.

2. Model Training: The Lenet model is implemented using the PyTorch framework and trained on the preprocessed MNIST dataset. The model is trained to classify the images into one of the ten digit classes with high accuracy. The training process is monitored and visualized using the Wandb library, which provides a dashboard for tracking the model's performance metrics, hyperparameters, and visualizations.

3. Model Deployment: Once the Lenet model is trained and optimized, it is deployed on the Hugging Face platform. Hugging Face provides a simple and user-friendly interface for deploying machine learning models, and it supports various deployment options, such as API, CLI, and web services. The deployed model can be accessed via a simple API call and can be used for real-time inference on new images of handwritten digits.

4. Testing and Evaluation: The deployed model can be tested by giving number in your handwriting and then it will predict whatever the result will be. The model's predictions while training are compared with the ground truth labels to measure its accuracy.

Results & Observations

Results and Observations can be seen on wandb library. Also, here is the picture that shows how our deployed model looks like.
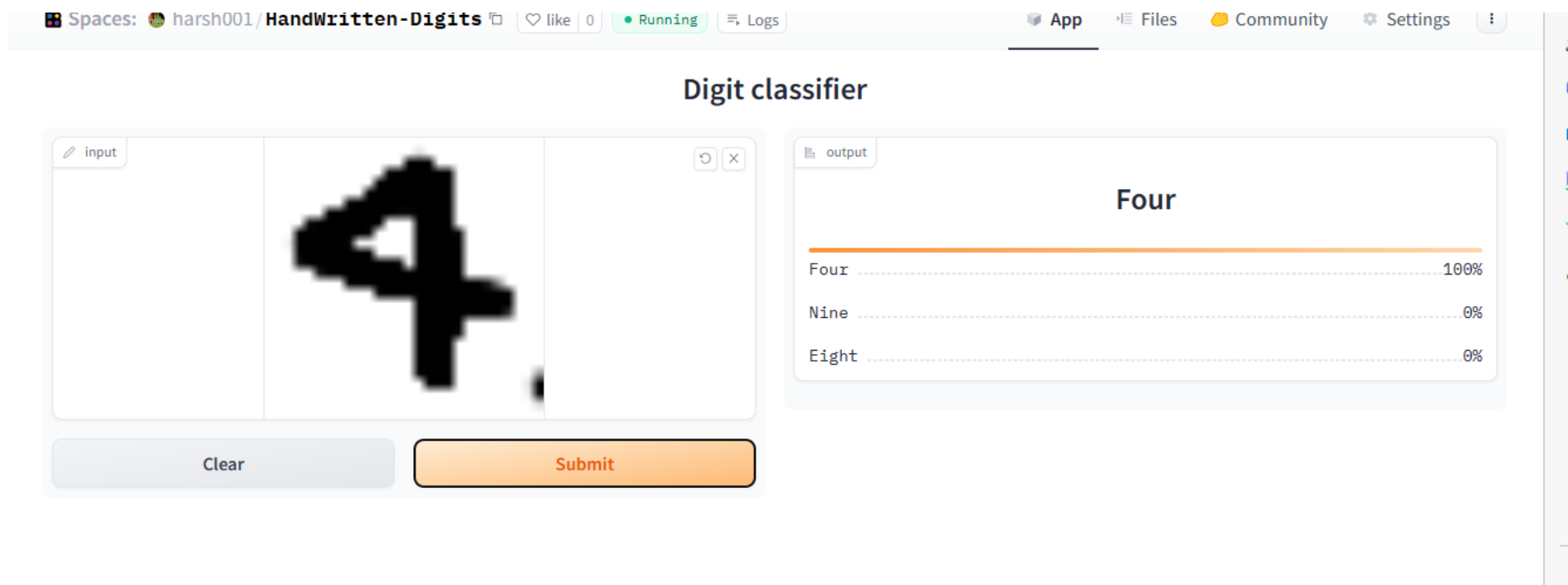
Hyperparameters & accuracy

SGD

Activation function : LeakyReLU
Train Loss: 1.669, Valid Loss: 1.697361, Accuracy: 0.65

The HyperParameters Choosen are :
optimizer function :   Adam
Activation function : LeakyReLU

Waiting for W&B process to finish... **(success).**

Train Loss: 0.004, Valid Loss: 0.041759, Accuracy: 0.99

The HyperParameters Choosen are :
 optimizer function :   SGD
 Activation function : LeakyReLU
Train Loss: 1.694, Valid Loss: 1.666333, Accuracy: 0.67

Links

MNIST Classifier - a Hugging Face Space by harsh001

Discover amazing ML apps made by the community

🤗 https://huggingface.co/spaces/harsh001/HandWritten-Digits

REFERANCES

MNIST database - Wikipedia

Writing LeNet5 from Scratch in PyTorch (paperspace.com)