**MNIST Digit Prediction Project Report**

**Project Overview:** The MNIST Digit Prediction project is a web-based application built using Django and TensorFlow that predicts handwritten digits from the MNIST dataset. The app allows users to upload images of handwritten digits, which are processed by a machine learning model to predict the corresponding digit.

**Technologies Used:**

* **Backend**: Django (Python framework for web development)
* **Machine Learning**: TensorFlow/Keras (used for training the digit recognition model)
* **Frontend**: HTML, CSS (Tailwind CSS), JavaScript (for interactivity)
* **Image Processing**: PIL (Python Imaging Library) for image preprocessing

**Key Features:**

* **Image Upload**: Users can upload an image either by dragging and dropping or choosing a file. The image is processed and resized to match the model's input format.
* **Prediction**: The trained model predicts the digit and displays the result to the user.
* **Model Accuracy**: The application also shows the model's prediction accuracy on the home page.

**Model Details:** The model architecture consists of:

1. **Flatten Layer**: Converts 28x28 input images into a 1D array.
2. **Dense Layer**: Hidden layer with 128 neurons and ReLU activation.
3. **Dropout Layer**: Regularization technique to prevent overfitting.
4. **Output Layer**: 10 neurons corresponding to the 10 possible digits.

The model is trained using the MNIST dataset, and the training process is optimized using the Adam optimizer with sparse categorical cross-entropy loss.

**Usage Instructions:**

1. Clone the repository from GitHub.
2. Set up the Django environment.
3. Upload a handwritten digit image for prediction.

**GitHub Repository Link:** [**MNIST Digit Prediction GitHub Repository**](https://github.com/Abiram116/ml_project.git)

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