🖌 Handwritten Digit Classifier

This project is a **Machine Learning model** developed in Python using **TensorFlow/Keras**, **Matplotlib**, and **NumPy**.

The model can **classify handwritten digits (0–9)** from grayscale images and predict results with an impressive **accuracy of 96.83%**. It also supports visualization of training metrics and predictions for easy analysis.

📸 Demo Preview

Test the classifier with preloaded sample images in the repository:

```
from predict import predict_digit

# Predict sample digits
predict_digit('samples/digit1.png')  # Predicts first sample
predict_digit('samples/digit2.png')  # Predicts second sample
predict_digit('samples/digit3.png')  # Predicts third sample
```

Input Image	Prediction
	**3** ✔
	**8** ✔
	**0** ✔

🛠 Key Features

- **Digit Classification** – Recognizes digits (0–9) from images.

- **High Accuracy** – Achieves **96.83% accuracy** during testing.
- **Visualization Tools** – Uses **Matplotlib** to display results and learning curves.
- **Easy-to-Use API** – Flexible input format for predictions.
- **Preloaded Samples** – Includes sample test images for quick evaluation.

Tech Stack

- **Language:** Python
- **Libraries:**
  - TensorFlow/Keras
  - NumPy
  - Matplotlib
  - Scikit-learn

Installation Guide

1. **Clone this Repository**

```
git clone https://github.com/yourusername/digit-classifier.git
cd digit-classifier
```

2. **Install Dependencies**

```
pip install -r requirements.txt
```

3. **Run the Model**

```
python main.py
```

Model Performance

Metric	Value
Accuracy	**96.83%**
Loss	0.072
Validation	**97.12%**

Feedback & Contributions

Contributions are always welcome!

- Feel free to **fork this repo**, submit **pull requests**, or open **issues**.
- Your suggestions and improvements are highly appreciated! 🙌

If you find this project helpful, consider giving it a star! ☆