ORACLE

AdrolT Technologies
Innovative Solutions Pvt LTD

Deep Learning-Based Handwritten Digit Recognition System

Student Name: Ajeem S

Register Number: 6201231 06001

Institution: AVS Engineering College

Department: ECE

Date of Submission: [Insert Date]

GitHub Repository Ljnk: GITHUB LINK

1 . Problem Statement

The goal is to build a deep learning model that can accurately recognize handwritten digits (0-9) from images.
This is a multiclass classification problem that mimics human-like recognition abilities.
Such applications are essential for smart devices, OCR systems, postal automation, and digitizing forms.

2. Abstract

This project focuses on recognizing handwritten digits using a Convolutional Neural Network (CNN).
The model is trained on the MNIST dataset, which contains thousands of grayscale images of handwritten numbers.
By applying deep learning techniques like CNN, we aim to achieve high accuracy in digit recognition.

The model is evaluated using accuracy, confusion matrix, and deployed with Streamlit to

demonstrate real-time digit classification. The project showcases the potential of Al in dig ttizing and automating tasks involving handwritten data.

3. System Requirements

Hardware:

-8 GB RAM
- Intel i5/i7 CPU or equivalent
- GPU (optional but recommended for faster train ing)

Software:

- Python: 3.8+
- IDE: Google Colab / Jupyter Notebook - Libraries:
- numpy, pandas
- matplotlib, seaborn
- tensorflow / keras
- scikit-learn
- streamlit / gradio

4. Objectives

- Build a CNN that can recognize handwritten digits from images
- Train and test using MNIST dataset
- Evaluate performance using standard classification metrics
- Deploy the model for interactive digit recognition
- Demonstrate practical Al application in digital transformation

5. Flowchart of Project Workflow

Data Collection Preprocessing EDA -i CNN Modeling Evaluation Deployment

(*lnsert flowchart image here using draw.io or Canva*)