Internship Final Report

Student Name: **Manan Kotiya**

University: **LDRP-ITR College, Gandhinagar**

Major: **Computer Engineering**

Internship Duration: **June 1st, 2025 - June 28th, 2025**

Company: **Shadow Fox**

Domain: **AI/ML**

Mentor: **Mr. Hariharan**

Coordinator: **Mr. Aakash**

PPT for the project is connected bellow:

img_tagging aim model.pptx

Objectives

The objective of this internship was to design and implement an AI-based image tagging system using Convolutional Neural Networks (CNNs) in TensorFlow. The model was trained on the CIFAR-10 dataset and was designed to classify images into 10 object categories such as dog, cat, car, and ship. This project aimed to develop hands-on understanding of dataset handling, model training, evaluation, and prediction.

Tasks and Responsibilities

1. Studied the CIFAR-10 dataset and explored its structure.

2. Built a CNN architecture using TensorFlow and Keras APIs.

3. Trained the model for multi-class classification.

4. Evaluated model performance and tuned hyperparameters.

5. Integrated image upload functionality via Google Colab.

6. Enabled user interaction by predicting class for uploaded real-world images.

7. Handled image preprocessing to match training data format.

8. Saved the final model in Keras format and documented the entire pipeline.

Learning Outcomes

- Learned the fundamentals of CNNs for image classification.

- Gained experience using TensorFlow and Google Colab.

- Understood image normalization, resizing, and reshaping.

- Practiced saving/loading machine learning models.

- Learned how to handle user input and real-world prediction edge cases.

Challenges and Solutions

The main challenge was dealing with different formats of user-uploaded images. Many uploaded images were grayscale or had an alpha channel (RGBA), which caused reshaping errors. This was resolved by converting images to RGB format before resizing and reshaping them.

Another challenge was the limited scope of the CIFAR-10 dataset, which affected prediction quality for real-world images. This was acknowledged and explained as a model limitation in the documentation.

Conclusion

This internship experience helped me apply AI/ML concepts in a real-world task. I developed a complete machine learning pipeline from training to prediction and user interaction. It strengthened my technical skills and gave me confidence to build and deploy ML models for practical applications.

Acknowledgments

I would like to express my gratitude to ShadowFox for the opportunity and guidance throughout this internship. Special thanks to my mentor Mr. Hariharan and coordinator Mr. Aakash for their invaluable support and mentorship.