Sunday 06-04-2025

Assignment: CIFAR 10

Dear Trainees,

As part of our internship program, I am assigning you a task to help solidify your understanding of the concepts we have covered in our sessions, I am assigning a practical task to help you apply what you have learned.

Tasks: Building a Convolutional Neural Network (CNN) tailored for the CIFAR-10 dataset using the **Keras** framework. Your goal is to preprocess the data, develop a deep learning model, and evaluate its performance.

Objectives:

- Data Insights and Exploration
  - Familiarize with the CIFAR-10 dataset.
  - Visually inspect sample images from various classes to understand data distribution.
- Comprehensive Data Preprocessing
  - Normalize pixel values of the images to enhance model training efficiency.
  - Implement data augmentation techniques to increase the dataset's variability and improve model generalization.
- Architectural Design using Keras
  - Design a Convolutional Neural Network (CNN) tailored for the CIFAR-10 dataset using the Keras framework.
  - Incorporate mechanisms such as dropouts and regularizations to counteract overfitting.
- Model Training Process
  - Train the CNN using the prepared dataset.
- Learning Analysis
  - Visualize the model's learning curves, observing both training and validation performance metrics over epochs.
- Model Evaluation
  - Assess the trained model's accuracy and loss on the unseen test data to determine its robustness.

- Real-world Generalization Check (Predictive Model)
  - Evaluate the model's predictive capability using an image not part of the CIFAR-10 dataset to gauge its real-world applicability.

Deliverables:

- Model accuracy of at least **85%**
- Clean and well-documented code
- Correct submission on GitHub

~~Submit your assignment by **Sunday 06/04/2025 Until 12:00PM**~~

Additional Notes:

- If you have any questions or need clarification, feel free to reach out to me.
- This assignment is an opportunity to practice and apply your knowledge, so make the most of it.

Best regards,

DS. Tariq