greatlearning

Project Description – Image classification using CNNs in Keras

Data Description:

The dataset has 60000 images in training set and 10000 images in test set. The images are from MNIST dataset.

Dataset: Load from Python library.

Context:

The MNIST digits dataset is a dataset of 60,000 small square 28×28 pixel grayscale images of handwritten single digits between 0 and 9.

Objective:

To implement the techniques learnt as a part of the course.

Learning Outcomes:

- Pre-processing of image data.
- Visualization of images.
- Building CNN
- Evaluate the Model

Steps and tasks:

1. Import the libraries, load dataset, print shape of data, visualize the images in dataset. (5 Marks)
2. Data Pre-processing: (15 Marks)
    a. Normalization.
    b. Gaussian Blurring.
    c. Visualize data after pre-processing.
3. Make data compatible: (10 Marks)
    a. Reshape data into shapes compatible with Keras models.
    b. Convert labels from digits to one hot vectors.
    c. Print the label for y_train[0].
4. Building CNN: (15 Marks)
    a. Define layers.
    b. Set optimizer and loss function. (Use Adam optimizer and categorical crossentropy)
5. Fit and evaluate model. (10 Marks)
6. Visualize predictions for x_test[2], x_test[3], x_test[33], x_test[36], x_test[59]. (5 Marks)

Happy Learning!