

**National Institute of Technology Rourkela**

**(An Institution of National Importance)**

**Five-Day Short-Term Course on Exploring Deep Learning: Applications and Practical Implementation**

**Hands-On**

**ANN + Optimisation and Regularization Techniques**

**(12-06-2024)**

**Regression Task:** [**Dataset**](https://www.kaggle.com/code/sohaibanwaar1203/neural-network-keras-regression/input)

**Model 1:**

Implement a deep multilayer perceptron (MLP) model with the following specifications for predicting graduate admissions from an Indian perspective. The model should have 4 hidden layers with 128, 64, 32, and 16 neurons, using tanh, relu, and linear activation functions, respectively. Apply different optimization techniques, such as Adam, SGD, and RMSprop, and compare their effects on the model's performance with batch size 32.

**Model 2:**

Implement a MLP model with the following specifications for predicting graduate admissions from an Indian perspective. The model should have 5 hidden layers with 256, 128, 64, 32, and 16 neurons, using tanh, relu, and linear activation functions, respectively. Apply regularization techniques, such as L2 regularization, dropout, or batch normalization, and analyze their impact on the model's performance. Use optimization techniques, such as Adam, SGD, or RMSprop, and compare their effects on the model's performance with batch size 64.

**Classification Task:** [**Datasets**](https://keras.io/api/datasets/)

**Model-1:**

Implement a MLP model with the following specifications for classifying the MNIST dataset. The model should have 4 hidden layers with 128, 64, 32, and 16 neurons, using sigmoid, tanh, and relu activation functions, respectively. Apply different optimization techniques, such as Adam, SGD, and RMSprop, and compare their effects on the model's performance with batch size 32.

**Model-2:**

Implement a MLP model with the following specifications for classifying the MNIST dataset. The model should have 5 hidden layers with 256, 128, 64, 32, and 16 neurons, using sigmoid, tanh, and relu activation functions, respectively. Apply regularization techniques, such as L2 regularization, dropout, or batch normalization, and analyze their impact on the model's performance. Use optimization techniques, such as Adam, SGD, or RMSprop, and compare their effects on the model's performance with batch size 64.