

# Deep Learning Image Classification with CNN

## Lesson Overview:

In this lesson, we are going to discuss Image classification with CNN.

## Use Case Description:

Image Classification with CNN

1. Training the model
2. Evaluating the model

## Programming elements:

1. About CNN
2. Hyperparameters of CNN
3. Image classification with CNN

## In class programming:

1. Follow the instruction below and then report how the performance changed.(apply all at once)

- Convolutional input layer, 32 feature maps with a size of  $3 \times 3$  and a rectifier activation function.
- Dropout layer at 20%.
- Convolutional layer, 32 feature maps with a size of  $3 \times 3$  and a rectifier activation function.
- Max Pool layer with size  $2 \times 2$ .
- Convolutional layer, 64 feature maps with a size of  $3 \times 3$  and a rectifier activation function.
- Dropout layer at 20%.
- Convolutional layer, 64 feature maps with a size of  $3 \times 3$  and a rectifier activation function.
- Max Pool layer with size  $2 \times 2$ .
- Convolutional layer, 128 feature maps with a size of  $3 \times 3$  and a rectifier activation function.
- Dropout layer at 20%.
- Convolutional layer, 128 feature maps with a size of  $3 \times 3$  and a rectifier activation function.
- Max Pool layer with size  $2 \times 2$ .
- Flatten layer.
- Dropout layer at 20%.
- Fully connected layer with 1024 units and a rectifier activation function.
- Dropout layer at 20%.
- Fully connected layer with 512 units and a rectifier activation function.
- Dropout layer at 20%.
- Fully connected output layer with 10 units and a Softmax activation function

Did the performance change?

2. Predict the first 4 images of the test data using the above model. Then, compare with the actual label for those 4 images to check whether or not the model has predicted correctly.
3. Visualize Loss and Accuracy using the history object

**Evaluation Criteria:**

1. Completeness of Features
2. Code Quality ([https://en.wikipedia.org/wiki/Best\\_coding\\_practices](https://en.wikipedia.org/wiki/Best_coding_practices))
3. Time

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