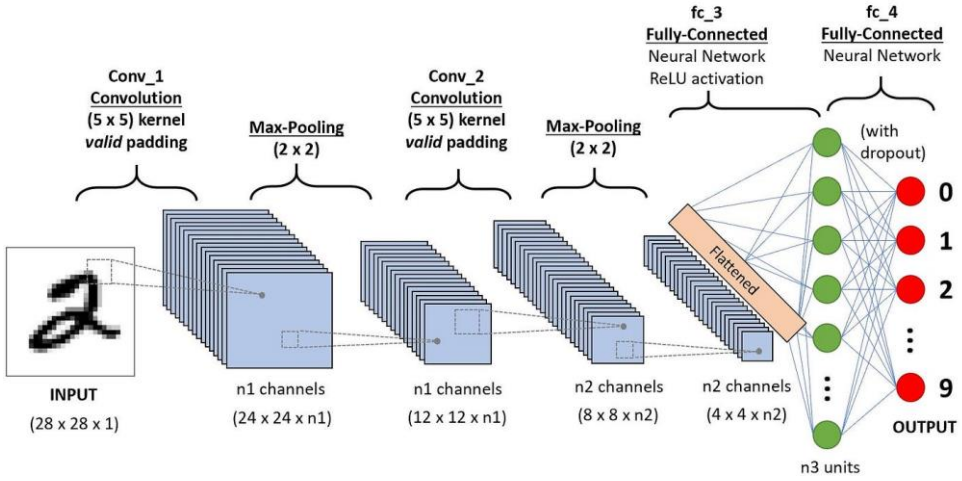
Training Report Day-24

3 July 2024

Define CNN

Convolutional Neural Networks (CNNs) are a type of deep learning model commonly used for image and object recognition tasks. They are composed of several layers, including convolutional layers, pooling layers, and fully connected layers.



1.TensorFlow

TensorFlow, developed by Google Brain, is an open-source deep learning framework that provides a flexible platform for building machine learning models. TensorFlow supports both low-level operations and high-level APIs.

2. PyTorch

PyTorch, developed by Facebook's AI Research lab (FAIR), is an open-source deep learning framework known for its flexibility and ease of use. It uses dynamic computation graphs, which makes it highly intuitive for researchers and developers.

3. Keras

Keras is an open-source deep learning framework that provides a high-level API for building and training deep learning models. Keras is user-friendly and modular, and it runs on top of TensorFlow.

Pooling layer

The goal of the pooling layer is to pull the most significant features from the convoluted matrix.

reduce the dimension of the feature map (convoluted matrix), hence reducing the memory used while training the network

Type

Max pooling, this is the maximum value of the feature map

Sum pooling corresponds to the sum of all the values of the feature map

Average pooling is the average of all the values.

Fully connected layers (dense layers)

are used to combine features learned by convolutional and pooling layers.

Each neuron in a fully connected layer is connected to every neuron in the previous layer.

```
import tensorflow as tf
from tensorflow.keras import layers, models
import matplotlib.pyplot as plt
import numpy as np

# tensorflow and its keras module are used to build and train the neural network.
# matplotlib.pyplot is used for plotting images.
# numpy is used for numerical operations.
plot_image_predictions(X_test.reshape(-1, 28, 28), y_test, predictions, num_images=5)
#In the context of reshaping image data for machine learning models, -1 often represents the batch size or the number of samples, allowing flexibility in handling varying dataset sizes
```