AI 2024
Week 6 Task

Objective

In this task, you will classify images as either cat or non-cat using a neural network implemented in TensorFlow.

Instructions

Step 1: Learn TensorFlow

First, familiarize yourself with TensorFlow. You can use resources such as the official TensorFlow Documentation, YouTube videos, or other tutorials available online. Make sure to have a basic understanding of the following concepts:

- Tensors
- Layers and models
- Loss functions and optimizers
- Training and evaluation

Step 2: Loading the Dataset

The dataset for this task is located in the folder `./datasets/`. It contains two files:

- `train_catvnoncat.h5`: The training set in HDF5 format.
- `test_catvnoncat.h5`: The test set in HDF5 format.

Additionally, you will find a Python script `loader.py`, which provides a function `load_data()` to load the dataset. Ensure you have the necessary package `h5py` installed to work with HDF5 files.

Step 3: Defining the Model

Define a neural network model suitable for binary classification (cat vs non-cat). You will use the following components:

- Input layer corresponding to the dimensions of the images.
- Hidden layers of your choice.
- Output layer with a single neuron and a sigmoid activation function.

Step 4: Training the Model

For training the model:

- Use Binary Cross-Entropy as the loss function.
- Use the Adam optimizer. (Adam will be introduced in further sessions, so for now, use it without needing to fully understand its internals).

Train the model for several epochs and track the loss at each epoch.

Step 5: Plot Loss vs Epoch

After training, plot a graph showing the loss value as a function of the number of epochs. This will help you visualize how the model improves during training.

Step 6: Testing the Model

Finally, evaluate your trained model on the test dataset and print out the final accuracy.