

Computer Science 3202/6915

Assignment 4 – Intro to TensorFlow

Due date: Friday March 31st by 11:30pm. (Closing date: April 5th at midnight)

Learning goals:

1. Get familiar with TensorFlow.
2. Practice applying neural network-based classification approaches.
3. Practice making video presentations.

Instructions:

1. Study and complete the TensorFlow tutorial “Basic classification: Classify images of clothing” available at <https://www.tensorflow.org/tutorials/keras/classification> (site works better with Google Chrome). Completing means that you are able to successfully run the code (locally, in LabNet, or in Google Colab), and studying means that you understand the code and would be able to modify it.
2. Once you have completed the tutorial, prepare a short video (less than 5 minutes) showing the code running on your computer locally, in LabNet, or in Google Colab, ending successfully, and explaining how to do the two topics assigned to you from the list below. You can pause recording while the program finishes so your video is less than 5 minutes long.
To find the topics assigned to you, get the remainder of dividing the last two digits of your student ID by 14 and get the remainder of dividing the last two digits of your student ID + 3 by 14.
 - For example, if your student ID is 201675195, then take the last two digits (i.e, 95) and in Python use the Modulo Operator %. That is, type in the Python console `95 % 14` for the first topic and `(95+3) % 14` for the second topic. The result, in this case 11 and 0, are the topics from the list below that you need to explain in your short video.
3. At the beginning of the video introduce yourself and, if possible, appear yourself during the introduction.
4. List of topics:
 0. Change the number of units in a layer of the network
 1. Change the optimization algorithm used to train the network
 2. Change the performance metric used to train the network
 3. Import and load the Fashion MNIST data
 4. Attach an output layer to the network
 5. Evaluate the model with test data
 6. Change the loss function used to train the network
 7. Change the number of epochs to train the network
 8. Obtain the output vector for an image
 9. Find the label with the highest confidence
 10. Plot an image and its predicted class
 11. Pre-process images to get the pixel values between 0 and 1.
 12. Display 10 images from the training data
 13. Add an extra dense layer with RELU units to the network

For this assignment you only have to submit your video in MP4 format through Brightspace.