Group organisation:

We tried a few approaches to the group tasks, for the first it was easy to split each task between each member, with two people working on one. As the task didn’t rely on each other they could be implemented separately. This worked well as support from others was available if we got stuck.

For the keyword spotting task the group organisation fell apart due to a communication failure. Members were not able to get a hold of each due to incorrect emails and loss of access to messaging accounts leading to only two members contributing to this exercise.

For the Signature Verification task we found it difficult at first to split the tasks up. As it required each part to be sequentially completed. In the beginning we came up with a theoretical solution to solve the task. It was hard to estimate the difficulty and time it would require to complete each part, So we ended up completing a feature or two each then passing the project along to the next person.

MLP

To solve this task we used a single linear hidden layer and another linear layer to classify the output of the network. To find the best performing network we tried to optimise three parameters learning rate, training epochs, and network depth. For each parameter 3 values were selected to test. This worked well to give an overview of how each parameter effected the accuracy, although this was computation intensive and took a long time to train. The downside to doing this was we could see some training runs, the test and validation loss were still going down and possibly had the potential to produce a more accurate result, but we did not have the time and computing power to test these further.

CNN:

To solve this task we used a model with two sets, each containing a convolution layer, leaky ReLU and a max pooling. The first convolution layer has 1 input channel and 16 output channels, while the second layer consists of 16 input layers and 32 output layers. In addition, both layers use stride of 1 and kernel size of 3. The model is implemented with the PyTorch library. The main evaluation parameters were loss and accuracy vs the total number of iterations. To achieve the best performance we optimized batch size, number of iterations and learning rate. The computation time was adequate which allowed us to achieve a high level of optimization.

Keyword spotting

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Signature Verification

The approach we used for this task was to read all the signatures from a file into a NumPy array containing the users and their corresponding signatures features (x, y, pressure, etc …) . To evaluate whether a signature was valid we first calculated the distance using dynamic time warping to each of the Enrolment signatures(Genuine). These distance values were then averaged together this was then compared to a threshold value to establish if a signature was Valid The threshold value is used to classify the signature. If the distance of a signature was larger than the threshold this showed that the signature was not close to the average genuine signature. The threshold value was found by iterating through a range of values and the most accurate threshold was selected

Overall thoughts on the group exercises

The group exercises were designed quite well and supplemented the theoretical lectures of the course and provided a better understanding of the course content. Due to COVID-19 restriction leading to not meeting each other in the group in person it made the exercises more difficult to complete as communication was difficult to establish it was also harder to assess members strengths and weakness which would have been useful assigning tasks to do within the group.