**Minutes**

03/02/23

* Discussed fixing MCC calculations with vectorised operations.
* Discussed the weighted loss function.
  + I’m using the BCEWithLogitsLoss because from experiments:
    - Prediction=[0.1, 0.9, 0.1, 0.9], targets=[0, 1, 1, 0] and w=[weight] produces
      * [w\*x, w\*x, w\*y, w\*y] loss values with weighted BCELoss.
      * [x, w\*x, y, w\*y] loss values with weighted BCEWithLogitsLoss.
  + Discussed BCELoss will be multiplying each value by the weight because of broadcasting.
    - To work around this we would need to define weight=weight\_multiplier\*labels for each sequence.
  + Discussed BCEWithLogitsLoss.
    - It is more numerically stable than BCELoss.
    - It applies the Sigmoid function alongside calculating the loss.
      * To test: remove final sigmoid activation function from network with this loss function.
    - The loss produced should be the same/very similar to the sigmoid activation function, then the BCELoss.
* Discussed query about differences between Disprot datasets (regions, consensus and notation (-, T, D for ordered, turns, disorder). It is fine to continue using the release from 06/2022 with my sequence processing.
  + I will ensure that my code can accept any new updated regions file from Disprot, such as the release from 12/2022. This will allow simple swapping of up-to-date datasets to be used to train my model.
* Discussed general purpose of assessing work done in dissertation.
  + Benefits of different inputs (1-hot, PSSM, encodings).
  + Assessment of loss curves improving while ensuring model isn’t overfitting.
  + Different architectures.
  + These items contribute to the tuning of the model alongside hyperparameter tuning.

Goals for this week:

* Focus on improving models by carefully tuning them. Hyperparameters and layers within the model.
* Use PSSM input.
* Ensure Notebooks are kept tidy.
* Write background section.