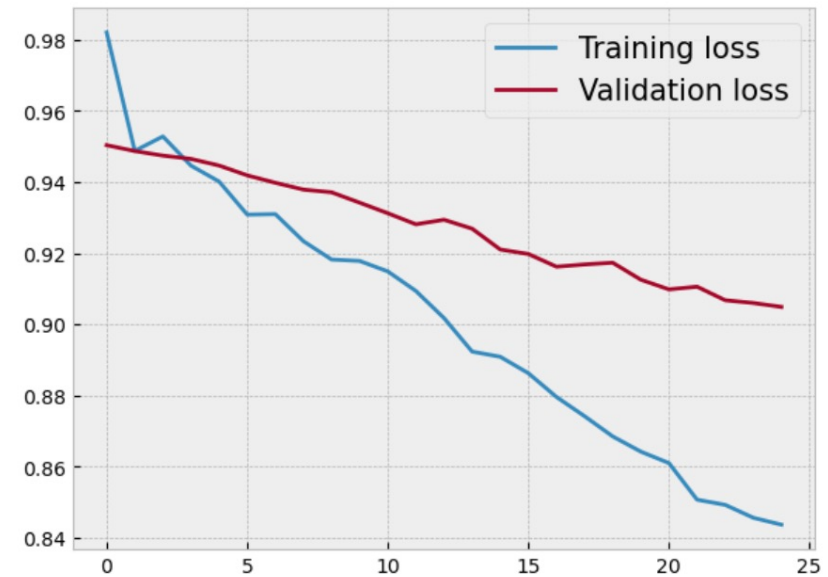
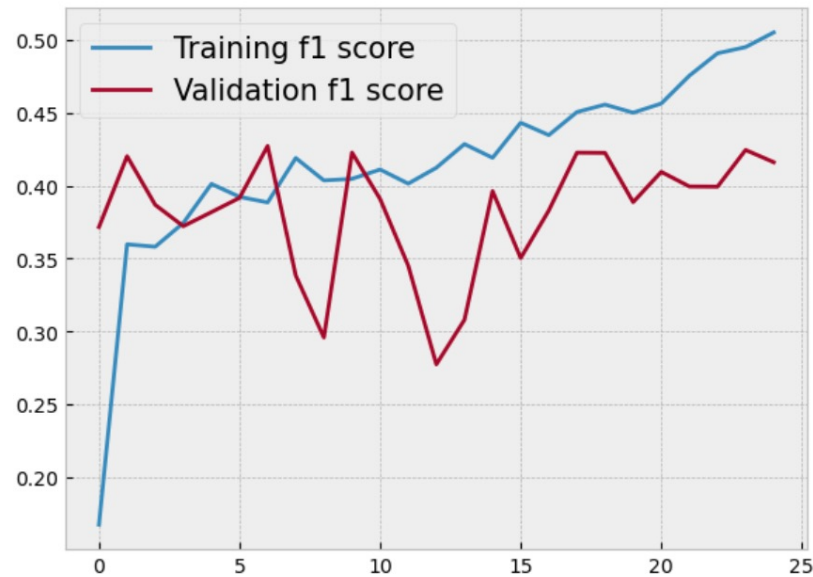


## Obaida Hanteer



- First, a quick and dirty method has been adopted to check the initial f1-score of a standard Convolutional Neural Network (CNN) when fitting the training data.





- Did not seem the model was able to learn, so one way to improve that was by checking if the training dataset is imbalanced.

	class	count	percentage
<b>0</b>	0	860	0.501750
<b>1</b>	1	196	0.114352
<b>2</b>	2	658	0.383897

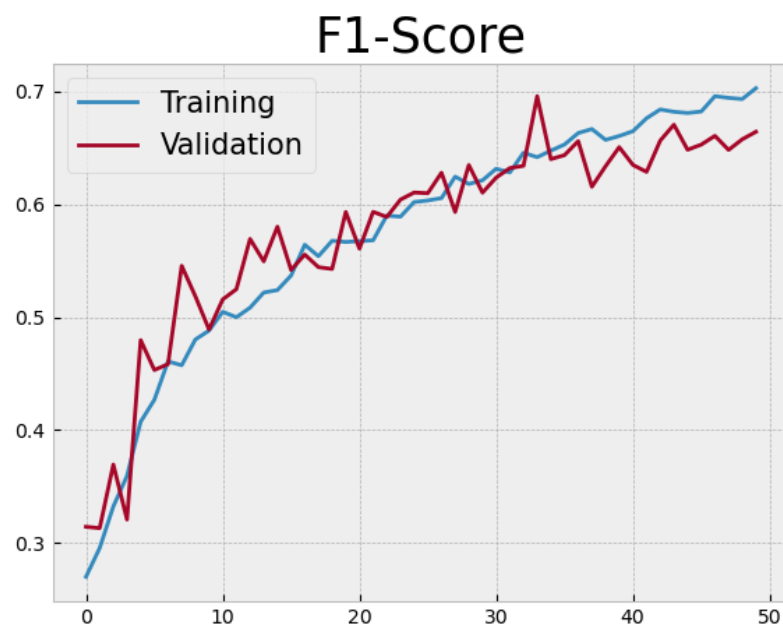


- A Sequence of zooming, flip, rotation and other augmentations has been applied on the under-represented classes to get a balanced data

	class	count	percentage
<b>0</b>	0	860	0.333333
<b>1</b>	1	860	0.333333
<b>2</b>	2	860	0.333333



- A standard convolutional neural network was built and trained on the balanced dataset. A noticeable progress has been noticed on the f1-score.





- Incorporating the information about longitude and latitude together with the images in a mixed neural network model would significantly improve the f1-score.
- Unfortunately, the calculation of the corresponding f1-score from such a mixed model was not finalized and added to the submission because of some debugging problems.