

Read unclassified into R  
Clean unclassified in R  
Add quotes and comma in excel  
Copy and paste into TextEdit  
Copy into Colab list  
Turn result list into data frame  
Write data frame to CSV  
Read CSV into R  
Merge newly classified table with original Dash on story.id  
Write CSV and open in excel

EISabry large category

```
=====] - 53s 711ms/step - loss: 1.4166 - accuracy: 0.4566 -  
balanced_recall: 0.0498 - balanced_precision: 0.0521 - balanced_f1_score: 0.0471 - val_loss:  
1.1101 - val_accuracy: 0.5426 - val_balanced_recall: 0.0684 - val_balanced_precision: 0.0631 -  
val_balanced_f1_score: 0.0653  
Epoch 2/40  
36/36 [=====] - 18s 503ms/step - loss: 1.0191 - accuracy:  
0.6002 - balanced_recall: 0.0771 - balanced_precision: 0.1049 - balanced_f1_score: 0.0864 -  
val_loss: 1.0258 - val_accuracy: 0.5612 - val_balanced_recall: 0.0835 - val_balanced_precision:  
0.0690 - val_balanced_f1_score: 0.0744  
Epoch 3/40  
36/36 [=====] - 20s 567ms/step - loss: 0.9460 - accuracy:  
0.6259 - balanced_recall: 0.0878 - balanced_precision: 0.1185 - balanced_f1_score: 0.0983 -  
val_loss: 0.9644 - val_accuracy: 0.5931 - val_balanced_recall: 0.0958 - val_balanced_precision:  
0.1195 - val_balanced_f1_score: 0.1048  
Epoch 4/40  
36/36 [=====] - 20s 553ms/step - loss: 0.8776 - accuracy:  
0.6569 - balanced_recall: 0.1035 - balanced_precision: 0.1519 - balanced_f1_score: 0.1208 -  
val_loss: 0.9260 - val_accuracy: 0.6250 - val_balanced_recall: 0.0996 - val_balanced_precision:  
0.1447 - val_balanced_f1_score: 0.1165  
Epoch 5/40  
36/36 [=====] - 20s 555ms/step - loss: 0.8400 - accuracy:  
0.6800 - balanced_recall: 0.1175 - balanced_precision: 0.1735 - balanced_f1_score: 0.1382 -
```

val\_loss: 0.8966 - val\_accuracy: 0.6144 - val\_balanced\_recall: 0.1127 - val\_balanced\_precision:  
0.1351 - val\_balanced\_f1\_score: 0.1220

Epoch 6/40

36/36 [=====] - 20s 553ms/step - loss: 0.7948 - accuracy:  
0.6977 - balanced\_recall: 0.1254 - balanced\_precision: 0.1844 - balanced\_f1\_score: 0.1475 -  
val\_loss: 0.8763 - val\_accuracy: 0.6569 - val\_balanced\_recall: 0.1133 - val\_balanced\_precision:  
0.1408 - val\_balanced\_f1\_score: 0.1246

Epoch 7/40

36/36 [=====] - 21s 582ms/step - loss: 0.7619 - accuracy:  
0.7145 - balanced\_recall: 0.1359 - balanced\_precision: 0.2012 - balanced\_f1\_score: 0.1609 -  
val\_loss: 0.8581 - val\_accuracy: 0.6543 - val\_balanced\_recall: 0.1180 - val\_balanced\_precision:  
0.1709 - val\_balanced\_f1\_score: 0.1376

Epoch 8/40

36/36 [=====] - 20s 562ms/step - loss: 0.7343 - accuracy:  
0.7349 - balanced\_recall: 0.1494 - balanced\_precision: 0.2253 - balanced\_f1\_score: 0.1767 -  
val\_loss: 0.8373 - val\_accuracy: 0.6676 - val\_balanced\_recall: 0.1257 - val\_balanced\_precision:  
0.1520 - val\_balanced\_f1\_score: 0.1368

Epoch 9/40

36/36 [=====] - 22s 605ms/step - loss: 0.7006 - accuracy:  
0.7429 - balanced\_recall: 0.1562 - balanced\_precision: 0.2416 - balanced\_f1\_score: 0.1876 -  
val\_loss: 0.8358 - val\_accuracy: 0.6862 - val\_balanced\_recall: 0.1290 - val\_balanced\_precision:  
0.1662 - val\_balanced\_f1\_score: 0.1435

Epoch 10/40

36/36 [=====] - 22s 608ms/step - loss: 0.6755 - accuracy:  
0.7553 - balanced\_recall: 0.1614 - balanced\_precision: 0.2424 - balanced\_f1\_score: 0.1915 -  
val\_loss: 0.8205 - val\_accuracy: 0.6622 - val\_balanced\_recall: 0.1296 - val\_balanced\_precision:  
0.1472 - val\_balanced\_f1\_score: 0.1373

Epoch 11/40

36/36 [=====] - 20s 561ms/step - loss: 0.6660 - accuracy:  
0.7633 - balanced\_recall: 0.1745 - balanced\_precision: 0.2587 - balanced\_f1\_score: 0.2067 -  
val\_loss: 0.8181 - val\_accuracy: 0.6755 - val\_balanced\_recall: 0.1373 - val\_balanced\_precision:  
0.1883 - val\_balanced\_f1\_score: 0.1570

Epoch 12/40

36/36 [=====] - 20s 557ms/step - loss: 0.6616 - accuracy:  
0.7518 - balanced\_recall: 0.1723 - balanced\_precision: 0.2467 - balanced\_f1\_score: 0.2009 -  
val\_loss: 0.8034 - val\_accuracy: 0.6862 - val\_balanced\_recall: 0.1408 - val\_balanced\_precision:  
0.1920 - val\_balanced\_f1\_score: 0.1603

Epoch 13/40

36/36 [=====] - 21s 587ms/step - loss: 0.6403 - accuracy:  
0.7651 - balanced\_recall: 0.1734 - balanced\_precision: 0.2546 - balanced\_f1\_score: 0.2043 -  
val\_loss: 0.8030 - val\_accuracy: 0.6755 - val\_balanced\_recall: 0.1416 - val\_balanced\_precision:  
0.1862 - val\_balanced\_f1\_score: 0.1588

Epoch 14/40

36/36 [=====] - 20s 568ms/step - loss: 0.6264 - accuracy: 0.7633 - balanced\_recall: 0.1867 - balanced\_precision: 0.2631 - balanced\_f1\_score: 0.2170 - val\_loss: 0.7991 - val\_accuracy: 0.6729 - val\_balanced\_recall: 0.1478 - val\_balanced\_precision: 0.2104 - val\_balanced\_f1\_score: 0.1717

Epoch 15/40

36/36 [=====] - 17s 481ms/step - loss: 0.6160 - accuracy: 0.7642 - balanced\_recall: 0.1866 - balanced\_precision: 0.2731 - balanced\_f1\_score: 0.2196 - val\_loss: 0.8013 - val\_accuracy: 0.6755 - val\_balanced\_recall: 0.1459 - val\_balanced\_precision: 0.2010 - val\_balanced\_f1\_score: 0.1665

Epoch 16/40

36/36 [=====] - 24s 676ms/step - loss: 0.6089 - accuracy: 0.7704 - balanced\_recall: 0.1907 - balanced\_precision: 0.2709 - balanced\_f1\_score: 0.2226 - val\_loss: 0.7987 - val\_accuracy: 0.6862 - val\_balanced\_recall: 0.1468 - val\_balanced\_precision: 0.1927 - val\_balanced\_f1\_score: 0.1644

Epoch 17/40

36/36 [=====] - 17s 484ms/step - loss: 0.6035 - accuracy: 0.7739 - balanced\_recall: 0.1970 - balanced\_precision: 0.2765 - balanced\_f1\_score: 0.2287 - val\_loss: 0.8022 - val\_accuracy: 0.6941 - val\_balanced\_recall: 0.1506 - val\_balanced\_precision: 0.2053 - val\_balanced\_f1\_score: 0.1716

Epoch 18/40

36/36 [=====] - 23s 640ms/step - loss: 0.5827 - accuracy: 0.7801 - balanced\_recall: 0.1945 - balanced\_precision: 0.2655 - balanced\_f1\_score: 0.2232 - val\_loss: 0.7957 - val\_accuracy: 0.6782 - val\_balanced\_recall: 0.1541 - val\_balanced\_precision: 0.2185 - val\_balanced\_f1\_score: 0.1787

Epoch 19/40

36/36 [=====] - 17s 483ms/step - loss: 0.5790 - accuracy: 0.7828 - balanced\_recall: 0.2162 - balanced\_precision: 0.2854 - balanced\_f1\_score: 0.2442 - val\_loss: 0.8089 - val\_accuracy: 0.6809 - val\_balanced\_recall: 0.1518 - val\_balanced\_precision: 0.2029 - val\_balanced\_f1\_score: 0.1719

Epoch 20/40

36/36 [=====] - 25s 703ms/step - loss: 0.5717 - accuracy: 0.7943 - balanced\_recall: 0.2051 - balanced\_precision: 0.2858 - balanced\_f1\_score: 0.2379 - val\_loss: 0.7886 - val\_accuracy: 0.7021 - val\_balanced\_recall: 0.1622 - val\_balanced\_precision: 0.2158 - val\_balanced\_f1\_score: 0.1820

Epoch 21/40

36/36 [=====] - 22s 621ms/step - loss: 0.5631 - accuracy: 0.7899 - balanced\_recall: 0.2022 - balanced\_precision: 0.2726 - balanced\_f1\_score: 0.2309 - val\_loss: 0.7844 - val\_accuracy: 0.6941 - val\_balanced\_recall: 0.1599 - val\_balanced\_precision: 0.2192 - val\_balanced\_f1\_score: 0.1833

Epoch 22/40

36/36 [=====] - 18s 489ms/step - loss: 0.5543 - accuracy: 0.7979 - balanced\_recall: 0.2128 - balanced\_precision: 0.2875 - balanced\_f1\_score: 0.2434 - val\_loss: 0.7869 - val\_accuracy: 0.6862 - val\_balanced\_recall: 0.1612 - val\_balanced\_precision: 0.2181 - val\_balanced\_f1\_score: 0.1838

Epoch 23/40

36/36 [=====] - 18s 492ms/step - loss: 0.5538 - accuracy: 0.7934 - balanced\_recall: 0.2125 - balanced\_precision: 0.2860 - balanced\_f1\_score: 0.2431 - val\_loss: 0.7905 - val\_accuracy: 0.6809 - val\_balanced\_recall: 0.1557 - val\_balanced\_precision: 0.2151 - val\_balanced\_f1\_score: 0.1789

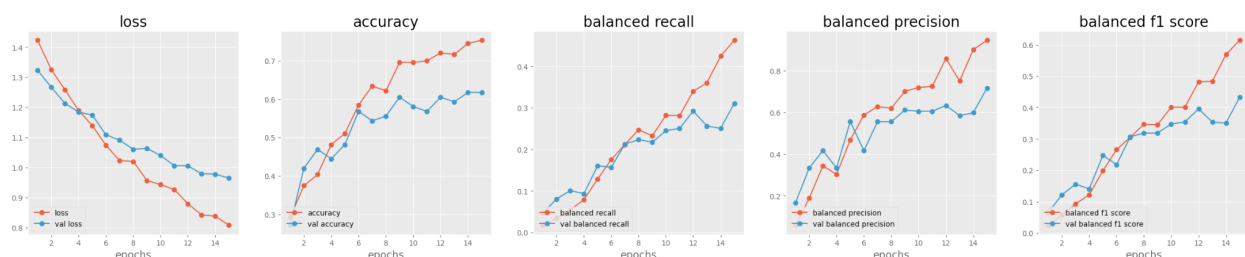
Epoch 24/40

36/36 [=====] - 19s 544ms/step - loss: 0.5366 - accuracy: 0.8156 - balanced\_recall: 0.2134 - balanced\_precision: 0.2929 - balanced\_f1\_score: 0.2455 - val\_loss: 0.7870 - val\_accuracy: 0.6862 - val\_balanced\_recall: 0.1632 - val\_balanced\_precision: 0.2107 - val\_balanced\_f1\_score: 0.1817

After REBALANCING:

Epoch 15/15 8/8 [=====] - 8s 1s/step - loss: 0.8080 - accuracy: 0.7531 - balanced\_recall: 0.4630 - balanced\_precision: 0.9466 - balanced\_f1\_score: 0.6142 - val\_loss: 0.9647 - val\_accuracy: 0.6173 - val\_balanced\_recall: 0.3110 - val\_balanced\_precision: 0.7167 - val\_balanced\_f1\_score: 0.4326

8/8 [=====] - 6s 745ms/step - loss: 0.4898 - accuracy: 0.8724 - balanced\_recall: 0.7250 - balanced\_precision: 0.9330 - balanced\_f1\_score: 0.8141 - val\_loss: 0.8517 - val\_accuracy: 0.6914 - val\_balanced\_recall: 0.4428 - val\_balanced\_precision: 0.6644 - val\_balanced\_f1\_score: 0.5293



Hicks Large Category

Epoch 1/20

38/38 [=====] - 53s 833ms/step - loss: 1.3817 - accuracy: 0.6169 - balanced\_recall: 0.0477 - balanced\_precision: 0.0439 - balanced\_f1\_score: 0.0421 - val\_loss: 1.0300 - val\_accuracy: 0.6843 - val\_balanced\_recall: 0.0639 - val\_balanced\_precision: 0.0486 - val\_balanced\_f1\_score: 0.0550

Epoch 2/20

38/38 [=====] - 20s 519ms/step - loss: 1.0240 - accuracy: 0.6827 - balanced\_recall: 0.0623 - balanced\_precision: 0.0492 - balanced\_f1\_score: 0.0547 - val\_loss: 0.9408 - val\_accuracy: 0.6894 - val\_balanced\_recall: 0.0645 - val\_balanced\_precision: 0.0493 - val\_balanced\_f1\_score: 0.0557

Epoch 3/20

38/38 [=====] - 21s 552ms/step - loss: 0.9280 - accuracy: 0.6878 - balanced\_recall: 0.0649 - balanced\_precision: 0.0536 - balanced\_f1\_score: 0.0581 - val\_loss: 0.8817 - val\_accuracy: 0.6869 - val\_balanced\_recall: 0.0658 - val\_balanced\_precision: 0.0491 - val\_balanced\_f1\_score: 0.0561

Epoch 4/20

38/38 [=====] - 21s 566ms/step - loss: 0.8538 - accuracy: 0.6979 - balanced\_recall: 0.0664 - balanced\_precision: 0.0643 - balanced\_f1\_score: 0.0637 - val\_loss: 0.8418 - val\_accuracy: 0.6919 - val\_balanced\_recall: 0.0654 - val\_balanced\_precision: 0.0497 - val\_balanced\_f1\_score: 0.0563

Epoch 5/20

38/38 [=====] - 19s 508ms/step - loss: 0.7975 - accuracy: 0.7105 - balanced\_recall: 0.0655 - balanced\_precision: 0.0637 - balanced\_f1\_score: 0.0635 - val\_loss: 0.8056 - val\_accuracy: 0.7096 - val\_balanced\_recall: 0.0651 - val\_balanced\_precision: 0.0513 - val\_balanced\_f1\_score: 0.0572

Epoch 6/20

38/38 [=====] - 22s 580ms/step - loss: 0.7675 - accuracy: 0.7241 - balanced\_recall: 0.0729 - balanced\_precision: 0.0862 - balanced\_f1\_score: 0.0771 - val\_loss: 0.8045 - val\_accuracy: 0.7045 - val\_balanced\_recall: 0.0663 - val\_balanced\_precision: 0.0544 - val\_balanced\_f1\_score: 0.0589

Epoch 7/20

38/38 [=====] - 23s 607ms/step - loss: 0.7299 - accuracy: 0.7300 - balanced\_recall: 0.0768 - balanced\_precision: 0.0965 - balanced\_f1\_score: 0.0839 - val\_loss: 0.7668 - val\_accuracy: 0.7197 - val\_balanced\_recall: 0.0706 - val\_balanced\_precision: 0.0677 - val\_balanced\_f1\_score: 0.0681

Epoch 8/20

38/38 [=====] - 22s 594ms/step - loss: 0.6836 - accuracy: 0.7586 - balanced\_recall: 0.0876 - balanced\_precision: 0.1105 - balanced\_f1\_score: 0.0963 - val\_loss: 0.7388 - val\_accuracy: 0.7374 - val\_balanced\_recall: 0.0784 - val\_balanced\_precision: 0.0948 - val\_balanced\_f1\_score: 0.0849

Epoch 9/20

38/38 [=====] - 22s 597ms/step - loss: 0.6758 - accuracy: 0.7595 - balanced\_recall: 0.0921 - balanced\_precision: 0.1254 - balanced\_f1\_score: 0.1050 - val\_loss: 0.7240 - val\_accuracy: 0.7399 - val\_balanced\_recall: 0.0784 - val\_balanced\_precision: 0.0948 - val\_balanced\_f1\_score: 0.0849

Epoch 10/20

38/38 [=====] - 25s 658ms/step - loss: 0.6294 - accuracy: 0.7831 - balanced\_recall: 0.1098 - balanced\_precision: 0.1474 - balanced\_f1\_score: 0.1245 - val\_loss: 0.7149 - val\_accuracy: 0.7374 - val\_balanced\_recall: 0.0801 - val\_balanced\_precision: 0.0946 - val\_balanced\_f1\_score: 0.0857

Epoch 11/20

38/38 [=====] - 21s 550ms/step - loss: 0.6254 - accuracy: 0.7857 - balanced\_recall: 0.1168 - balanced\_precision: 0.1671 - balanced\_f1\_score: 0.1360 - val\_loss: 0.7065 - val\_accuracy: 0.7348 - val\_balanced\_recall: 0.0815 - val\_balanced\_precision: 0.0996 - val\_balanced\_f1\_score: 0.0888

Epoch 12/20

38/38 [=====] - 24s 628ms/step - loss: 0.5975 - accuracy: 0.7899 - balanced\_recall: 0.1244 - balanced\_precision: 0.1662 - balanced\_f1\_score: 0.1408 - val\_loss: 0.7017 - val\_accuracy: 0.7348 - val\_balanced\_recall: 0.0959 - val\_balanced\_precision: 0.1153 - val\_balanced\_f1\_score: 0.1036

Epoch 13/20

38/38 [=====] - 24s 625ms/step - loss: 0.5969 - accuracy: 0.8025 - balanced\_recall: 0.1379 - balanced\_precision: 0.1812 - balanced\_f1\_score: 0.1555 - val\_loss: 0.6943 - val\_accuracy: 0.7399 - val\_balanced\_recall: 0.0882 - val\_balanced\_precision: 0.1044 - val\_balanced\_f1\_score: 0.0947

Epoch 14/20

38/38 [=====] - 25s 675ms/step - loss: 0.5710 - accuracy: 0.8034 - balanced\_recall: 0.1268 - balanced\_precision: 0.1658 - balanced\_f1\_score: 0.1423 - val\_loss: 0.6836 - val\_accuracy: 0.7424 - val\_balanced\_recall: 0.0937 - val\_balanced\_precision: 0.1213 - val\_balanced\_f1\_score: 0.1044

Epoch 15/20

38/38 [=====] - 25s 651ms/step - loss: 0.5537 - accuracy: 0.8068 - balanced\_recall: 0.1441 - balanced\_precision: 0.1897 - balanced\_f1\_score: 0.1623 - val\_loss: 0.6792 - val\_accuracy: 0.7551 - val\_balanced\_recall: 0.1057 - val\_balanced\_precision: 0.1317 - val\_balanced\_f1\_score: 0.1164

Epoch 16/20

38/38 [=====] - 18s 467ms/step - loss: 0.5732 - accuracy: 0.7958 - balanced\_recall: 0.1368 - balanced\_precision: 0.1735 - balanced\_f1\_score: 0.1512 - val\_loss: 0.6916 - val\_accuracy: 0.7626 - val\_balanced\_recall: 0.1040 - val\_balanced\_precision: 0.1251 - val\_balanced\_f1\_score: 0.1124

Epoch 17/20

38/38 [=====] - 24s 646ms/step - loss: 0.5462 - accuracy: 0.8169 - balanced\_recall: 0.1504 - balanced\_precision: 0.1969 - balanced\_f1\_score: 0.1693 - val\_loss: 0.6735 - val\_accuracy: 0.7551 - val\_balanced\_recall: 0.1078 - val\_balanced\_precision: 0.1432 - val\_balanced\_f1\_score: 0.1217

Epoch 18/20

38/38 [=====] - 24s 641ms/step - loss: 0.5412 - accuracy: 0.8118 - balanced\_recall: 0.1656 - balanced\_precision: 0.2105 - balanced\_f1\_score: 0.1840 - val\_loss: 0.6706 - val\_accuracy: 0.7551 - val\_balanced\_recall: 0.0995 - val\_balanced\_precision: 0.1320 - val\_balanced\_f1\_score: 0.1121

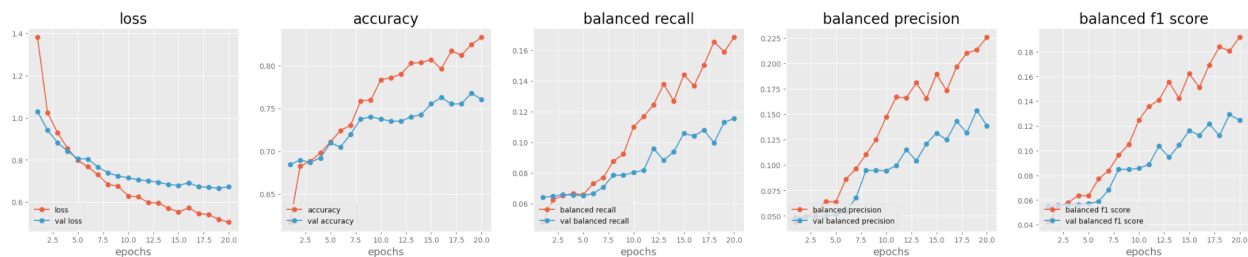
Epoch 19/20

38/38 [=====] - 26s 682ms/step - loss: 0.5175 - accuracy: 0.8245 - balanced\_recall: 0.1590 - balanced\_precision: 0.2138 - balanced\_f1\_score: 0.1806 -

val\_loss: 0.6665 - val\_accuracy: 0.7677 - val\_balanced\_recall: 0.1129 - val\_balanced\_precision: 0.1540 - val\_balanced\_f1\_score: 0.1292

Epoch 20/20

38/38 [=====] - 20s 526ms/step - loss: 0.5052 - accuracy: 0.8329 - balanced\_recall: 0.1685 - balanced\_precision: 0.2261 - balanced\_f1\_score: 0.1917 - val\_loss: 0.6730 - val\_accuracy: 0.7601 - val\_balanced\_recall: 0.1155 - val\_balanced\_precision: 0.1389 - val\_balanced\_f1\_score: 0.1246



## HICKS

Epoch 1/30

38/38 [=====] - 59s 725ms/step - loss: 1.4777 - accuracy: 0.5755 - balanced\_recall: 0.0434 - balanced\_precision: 0.0382 - balanced\_f1\_score: 0.0374 - val\_loss: 1.0096 - val\_accuracy: 0.7096 - val\_balanced\_recall: 0.0611 - val\_balanced\_precision: 0.0482 - val\_balanced\_f1\_score: 0.0538

Epoch 2/30

38/38 [=====] - 21s 552ms/step - loss: 1.0578 - accuracy: 0.6675 - balanced\_recall: 0.0565 - balanced\_precision: 0.0469 - balanced\_f1\_score: 0.0509 - val\_loss: 0.9117 - val\_accuracy: 0.7172 - val\_balanced\_recall: 0.0617 - val\_balanced\_precision: 0.0502 - val\_balanced\_f1\_score: 0.0553

Epoch 3/30

38/38 [=====] - 20s 533ms/step - loss: 0.9406 - accuracy: 0.6785 - balanced\_recall: 0.0648 - balanced\_precision: 0.0562 - balanced\_f1\_score: 0.0596 - val\_loss: 0.8758 - val\_accuracy: 0.7146 - val\_balanced\_recall: 0.0609 - val\_balanced\_precision: 0.0640 - val\_balanced\_f1\_score: 0.0613

Epoch 4/30

38/38 [=====] - 22s 574ms/step - loss: 0.8708 - accuracy: 0.6954 - balanced\_recall: 0.0668 - balanced\_precision: 0.0646 - balanced\_f1\_score: 0.0645 - val\_loss: 0.8298 - val\_accuracy: 0.7273 - val\_balanced\_recall: 0.0626 - val\_balanced\_precision: 0.0690 - val\_balanced\_f1\_score: 0.0643

Epoch 5/30

38/38 [=====] - 21s 551ms/step - loss: 0.8137 - accuracy: 0.7013 - balanced\_recall: 0.0721 - balanced\_precision: 0.0775 - balanced\_f1\_score: 0.0726 -

val\_loss: 0.8011 - val\_accuracy: 0.7424 - val\_balanced\_recall: 0.0684 - val\_balanced\_precision: 0.0800 - val\_balanced\_f1\_score: 0.0722

Epoch 6/30

38/38 [=====] - 20s 531ms/step - loss: 0.7836 - accuracy: 0.7207 - balanced\_recall: 0.0728 - balanced\_precision: 0.0888 - balanced\_f1\_score: 0.0783 - val\_loss: 0.7754 - val\_accuracy: 0.7449 - val\_balanced\_recall: 0.0752 - val\_balanced\_precision: 0.0900 - val\_balanced\_f1\_score: 0.0804

Epoch 7/30

38/38 [=====] - 21s 557ms/step - loss: 0.7325 - accuracy: 0.7342 - balanced\_recall: 0.0816 - balanced\_precision: 0.1039 - balanced\_f1\_score: 0.0897 - val\_loss: 0.7633 - val\_accuracy: 0.7475 - val\_balanced\_recall: 0.0765 - val\_balanced\_precision: 0.1020 - val\_balanced\_f1\_score: 0.0861

Epoch 8/30

38/38 [=====] - 21s 549ms/step - loss: 0.7118 - accuracy: 0.7426 - balanced\_recall: 0.0862 - balanced\_precision: 0.1197 - balanced\_f1\_score: 0.0984 - val\_loss: 0.7595 - val\_accuracy: 0.7525 - val\_balanced\_recall: 0.0754 - val\_balanced\_precision: 0.0957 - val\_balanced\_f1\_score: 0.0832

Epoch 9/30

38/38 [=====] - 21s 563ms/step - loss: 0.6756 - accuracy: 0.7722 - balanced\_recall: 0.1034 - balanced\_precision: 0.1430 - balanced\_f1\_score: 0.1183 - val\_loss: 0.7382 - val\_accuracy: 0.7525 - val\_balanced\_recall: 0.0902 - val\_balanced\_precision: 0.1205 - val\_balanced\_f1\_score: 0.1023

Epoch 10/30

38/38 [=====] - 21s 547ms/step - loss: 0.6477 - accuracy: 0.7789 - balanced\_recall: 0.1055 - balanced\_precision: 0.1470 - balanced\_f1\_score: 0.1215 - val\_loss: 0.7295 - val\_accuracy: 0.7601 - val\_balanced\_recall: 0.0864 - val\_balanced\_precision: 0.1134 - val\_balanced\_f1\_score: 0.0973

Epoch 11/30

38/38 [=====] - 22s 594ms/step - loss: 0.6314 - accuracy: 0.7722 - balanced\_recall: 0.1184 - balanced\_precision: 0.1582 - balanced\_f1\_score: 0.1341 - val\_loss: 0.7241 - val\_accuracy: 0.7626 - val\_balanced\_recall: 0.0934 - val\_balanced\_precision: 0.1186 - val\_balanced\_f1\_score: 0.1035

Epoch 12/30

38/38 [=====] - 21s 567ms/step - loss: 0.6169 - accuracy: 0.7814 - balanced\_recall: 0.1258 - balanced\_precision: 0.1758 - balanced\_f1\_score: 0.1456 - val\_loss: 0.7062 - val\_accuracy: 0.7626 - val\_balanced\_recall: 0.0943 - val\_balanced\_precision: 0.1240 - val\_balanced\_f1\_score: 0.1062

Epoch 13/30

38/38 [=====] - 18s 480ms/step - loss: 0.6208 - accuracy: 0.7764 - balanced\_recall: 0.1289 - balanced\_precision: 0.1654 - balanced\_f1\_score: 0.1432 - val\_loss: 0.7118 - val\_accuracy: 0.7677 - val\_balanced\_recall: 0.0950 - val\_balanced\_precision: 0.1231 - val\_balanced\_f1\_score: 0.1065

Epoch 14/30



38/38 [=====] - 18s 479ms/step - loss: 0.5819 - accuracy: 0.7983 - balanced\_recall: 0.1379 - balanced\_precision: 0.1918 - balanced\_f1\_score: 0.1593 - val\_loss: 0.7143 - val\_accuracy: 0.7551 - val\_balanced\_recall: 0.1023 - val\_balanced\_precision: 0.1311 - val\_balanced\_f1\_score: 0.1140

Epoch 15/30

38/38 [=====] - 23s 603ms/step - loss: 0.5812 - accuracy: 0.8051 - balanced\_recall: 0.1425 - balanced\_precision: 0.1925 - balanced\_f1\_score: 0.1627 - val\_loss: 0.6930 - val\_accuracy: 0.7677 - val\_balanced\_recall: 0.0959 - val\_balanced\_precision: 0.1204 - val\_balanced\_f1\_score: 0.1059

Epoch 16/30

38/38 [=====] - 18s 476ms/step - loss: 0.5515 - accuracy: 0.8051 - balanced\_recall: 0.1519 - balanced\_precision: 0.2045 - balanced\_f1\_score: 0.1727 - val\_loss: 0.6943 - val\_accuracy: 0.7702 - val\_balanced\_recall: 0.0992 - val\_balanced\_precision: 0.1251 - val\_balanced\_f1\_score: 0.1100

Epoch 17/30

38/38 [=====] - 18s 480ms/step - loss: 0.5584 - accuracy: 0.8084 - balanced\_recall: 0.1549 - balanced\_precision: 0.1959 - balanced\_f1\_score: 0.1717 - val\_loss: 0.6944 - val\_accuracy: 0.7803 - val\_balanced\_recall: 0.1102 - val\_balanced\_precision: 0.1387 - val\_balanced\_f1\_score: 0.1220

Epoch 18/30

38/38 [=====] - 22s 577ms/step - loss: 0.5401 - accuracy: 0.8270 - balanced\_recall: 0.1676 - balanced\_precision: 0.2146 - balanced\_f1\_score: 0.1870 - val\_loss: 0.6920 - val\_accuracy: 0.7702 - val\_balanced\_recall: 0.1009 - val\_balanced\_precision: 0.1173 - val\_balanced\_f1\_score: 0.1077

Epoch 19/30

38/38 [=====] - 23s 601ms/step - loss: 0.5289 - accuracy: 0.8245 - balanced\_recall: 0.1626 - balanced\_precision: 0.2113 - balanced\_f1\_score: 0.1819 - val\_loss: 0.6901 - val\_accuracy: 0.7727 - val\_balanced\_recall: 0.1010 - val\_balanced\_precision: 0.1170 - val\_balanced\_f1\_score: 0.1077

Epoch 20/30

38/38 [=====] - 23s 606ms/step - loss: 0.5278 - accuracy: 0.8101 - balanced\_recall: 0.1721 - balanced\_precision: 0.2262 - balanced\_f1\_score: 0.1946 - val\_loss: 0.6846 - val\_accuracy: 0.7753 - val\_balanced\_recall: 0.1127 - val\_balanced\_precision: 0.1409 - val\_balanced\_f1\_score: 0.1245

Epoch 21/30

38/38 [=====] - 18s 479ms/step - loss: 0.5179 - accuracy: 0.8152 - balanced\_recall: 0.1636 - balanced\_precision: 0.2158 - balanced\_f1\_score: 0.1849 - val\_loss: 0.6863 - val\_accuracy: 0.7854 - val\_balanced\_recall: 0.1071 - val\_balanced\_precision: 0.1251 - val\_balanced\_f1\_score: 0.1147

Epoch 22/30

38/38 [=====] - 17s 453ms/step - loss: 0.5089 - accuracy: 0.8329 - balanced\_recall: 0.1827 - balanced\_precision: 0.2315 - balanced\_f1\_score: 0.2029 - val\_loss: 0.6901 - val\_accuracy: 0.7753 - val\_balanced\_recall: 0.1048 - val\_balanced\_precision: 0.1263 - val\_balanced\_f1\_score: 0.1138

Epoch 23/30

38/38 [=====] - 24s 632ms/step - loss: 0.4964 - accuracy: 0.8363 - balanced\_recall: 0.1806 - balanced\_precision: 0.2342 - balanced\_f1\_score: 0.2027 - val\_loss: 0.6825 - val\_accuracy: 0.7803 - val\_balanced\_recall: 0.1147 - val\_balanced\_precision: 0.1366 - val\_balanced\_f1\_score: 0.1239

Epoch 24/30

38/38 [=====] - 18s 474ms/step - loss: 0.4882 - accuracy: 0.8430 - balanced\_recall: 0.1869 - balanced\_precision: 0.2364 - balanced\_f1\_score: 0.2080 - val\_loss: 0.6834 - val\_accuracy: 0.7778 - val\_balanced\_recall: 0.1124 - val\_balanced\_precision: 0.1368 - val\_balanced\_f1\_score: 0.1227

Epoch 25/30

38/38 [=====] - 18s 482ms/step - loss: 0.4896 - accuracy: 0.8304 - balanced\_recall: 0.1784 - balanced\_precision: 0.2277 - balanced\_f1\_score: 0.1987 - val\_loss: 0.6853 - val\_accuracy: 0.7677 - val\_balanced\_recall: 0.1239 - val\_balanced\_precision: 0.1512 - val\_balanced\_f1\_score: 0.1353

**Epoch 26/30**

38/38 [=====] - 20s 529ms/step - loss: 0.4846 - accuracy: 0.8363 - balanced\_recall: 0.1940 - balanced\_precision: 0.2512 - balanced\_f1\_score: 0.2176 - val\_loss: 0.6989 - val\_accuracy: 0.7551 - val\_balanced\_recall: 0.1318 - val\_balanced\_precision: 0.1557 - val\_balanced\_f1\_score: 0.1421

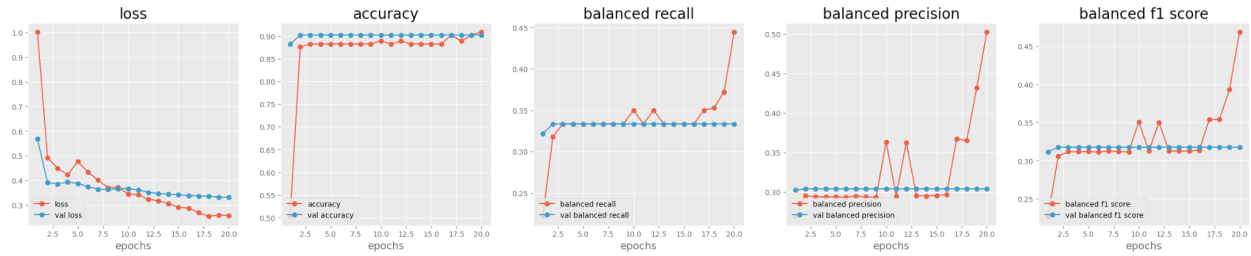
## **Sociocultural Forces**

Epoch 19/40

19/19 [=====] - 10s 563ms/step - loss: 0.7658 - accuracy: 0.6899 - balanced\_recall: 0.3680 - balanced\_precision: 0.6116 - balanced\_f1\_score: 0.4570 - val\_loss: 1.0580 - val\_accuracy: 0.5423 - val\_balanced\_recall: 0.2815 - val\_balanced\_precision: 0.3665 - val\_balanced\_f1\_score: 0.3109

EISabry Mid categories (Extramural)

5/5 [=====] - 8s 2s/step - loss: 0.2588 - accuracy: 0.9085 - balanced\_recall: 0.4444 - balanced\_precision: 0.5024 - balanced\_f1\_score: 0.4686 - val\_loss: 0.3326 - val\_accuracy: 0.9020 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.3037 - val\_balanced\_f1\_score: 0.3177

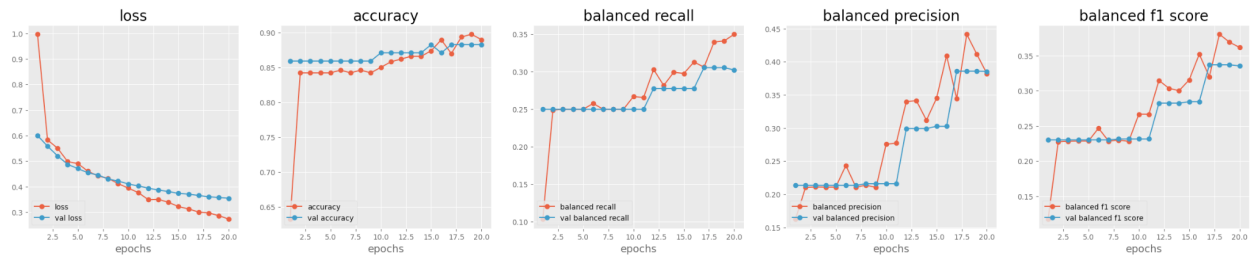


## EISabry Evidence-based categories:

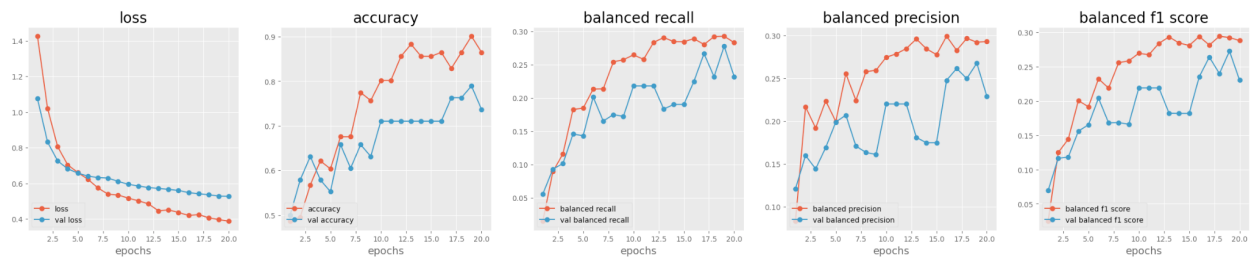
Epoch 19/20

8/8 [=====] - 7s 1s/step - loss: 0.2859 - accuracy: 0.8972 - balanced\_recall: 0.3411 - balanced\_precision: 0.4114 - balanced\_f1\_score: 0.3693 - val\_loss: 0.3571 - val\_accuracy: 0.8824 - val\_balanced\_recall: 0.3056 - val\_balanced\_precision: 0.3858 - val\_balanced\_f1\_score: 0.3370

Epoch 20/20



## EISabry Personal Category

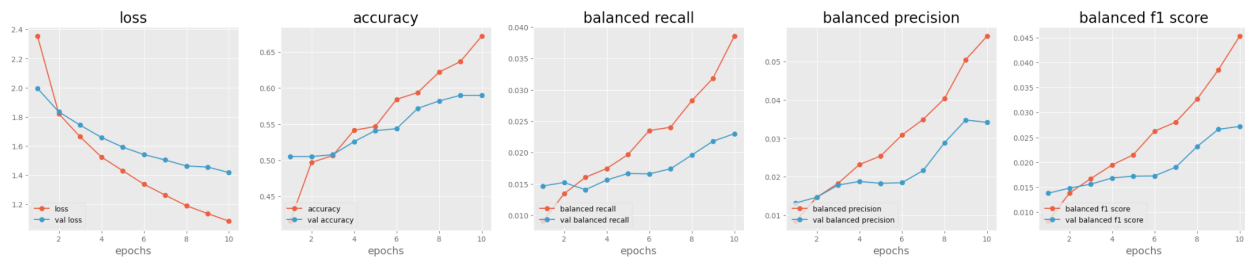


Epoch 19/20

4/4 [=====] - 5s 2s/step - loss: 0.3966 - accuracy: 0.9009 - balanced\_recall: 0.2928 - balanced\_precision: 0.2925 - balanced\_f1\_score: 0.2926 - val\_loss: 0.5286 - val\_accuracy: 0.7895 - val\_balanced\_recall: 0.2778 - val\_balanced\_precision: 0.2680 - val\_balanced\_f1\_score: 0.2728

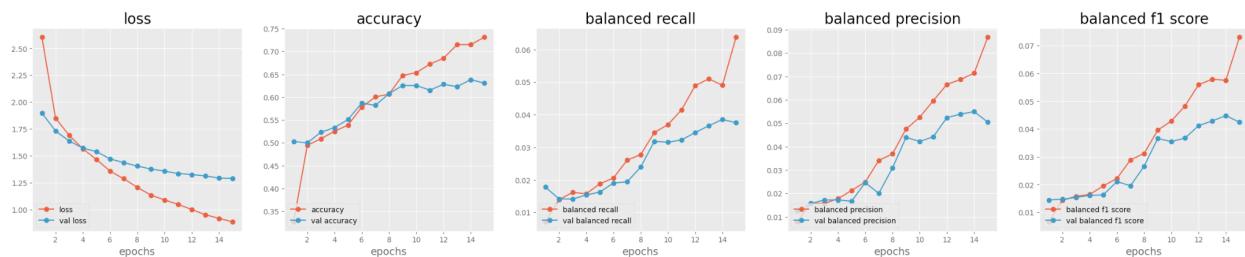
## HICKS Middle Category

Epoch 10/10 37/37 [=====] - 22s 591ms/step - loss: 1.0839 - accuracy: 0.6715 - balanced\_recall: 0.0385 - balanced\_precision: 0.0566 - balanced\_f1\_score: 0.0453 - val\_loss: 1.4178 - val\_accuracy: 0.5897 - val\_balanced\_recall: 0.0230 - val\_balanced\_precision: 0.0342 - val\_balanced\_f1\_score: 0.0272



## 2nd try (15 Epochs)

Epoch 15/15 37/37 [=====] - 21s 580ms/step - loss: 0.8836 - accuracy: 0.7314 - balanced\_recall: 0.0638 - balanced\_precision: 0.0868 - balanced\_f1\_score: 0.0730 - val\_loss: 1.2886 - val\_accuracy: 0.6308 - val\_balanced\_recall: 0.0375 - val\_balanced\_precision: 0.0505 - val\_balanced\_f1\_score: 0.0424



## EISabry Large Categories

Using RELU Optimizer

Few shot learning

6/6 [=====] - 5s 842ms/step - loss: 0.5158 - accuracy: 0.8902 - balanced\_recall: 0.7501 - balanced\_precision: 0.9822 - balanced\_f1\_score: 0.8496 - val\_loss: 0.9942 - val\_accuracy: 0.6364 - val\_balanced\_recall: 0.4039 - val\_balanced\_precision: 0.6083 - val\_balanced\_f1\_score: 0.4847

## LAMB Optimizer

Training EISabry Large Category on 6/26/23

Epoch 1/20

40/40 [=====] - 50s 639ms/step - loss: 1.4771 - accuracy: 0.4647 - balanced\_recall: 0.0600 - balanced\_precision: 0.0658 - balanced\_f1\_score: 0.0564 - val\_loss: 1.2298 - val\_accuracy: 0.5172 - val\_balanced\_recall: 0.0682 - val\_balanced\_precision: 0.0772 - val\_balanced\_f1\_score: 0.0705

Epoch 2/20

40/40 [=====] - 20s 511ms/step - loss: 1.1771 - accuracy: 0.5424 - balanced\_recall: 0.0862 - balanced\_precision: 0.0968 - balanced\_f1\_score: 0.0885 - val\_loss: 1.1182 - val\_accuracy: 0.5580 - val\_balanced\_recall: 0.0880 - val\_balanced\_precision: 0.1179 - val\_balanced\_f1\_score: 0.0980

Epoch 3/20

40/40 [=====] - 19s 469ms/step - loss: 1.0784 - accuracy: 0.5730 - balanced\_recall: 0.0978 - balanced\_precision: 0.1391 - balanced\_f1\_score: 0.1129 - val\_loss: 1.0552 - val\_accuracy: 0.6050 - val\_balanced\_recall: 0.1043 - val\_balanced\_precision: 0.1670 - val\_balanced\_f1\_score: 0.1268

Epoch 4/20

40/40 [=====] - 21s 520ms/step - loss: 1.0051 - accuracy: 0.6130 - balanced\_recall: 0.1138 - balanced\_precision: 0.1659 - balanced\_f1\_score: 0.1331 - val\_loss: 0.9990 - val\_accuracy: 0.6082 - val\_balanced\_recall: 0.1188 - val\_balanced\_precision: 0.1900 - val\_balanced\_f1\_score: 0.1448

Epoch 5/20

40/40 [=====] - 19s 477ms/step - loss: 0.9637 - accuracy: 0.6201 - balanced\_recall: 0.1204 - balanced\_precision: 0.1690 - balanced\_f1\_score: 0.1386 - val\_loss: 0.9711 - val\_accuracy: 0.6583 - val\_balanced\_recall: 0.1290 - val\_balanced\_precision: 0.2155 - val\_balanced\_f1\_score: 0.1596

Epoch 6/20

40/40 [=====] - 19s 477ms/step - loss: 0.9047 - accuracy: 0.6633 - balanced\_recall: 0.1411 - balanced\_precision: 0.2164 - balanced\_f1\_score: 0.1690 - val\_loss: 0.9354 - val\_accuracy: 0.6458 - val\_balanced\_recall: 0.1298 - val\_balanced\_precision: 0.2123 - val\_balanced\_f1\_score: 0.1598

Epoch 7/20

40/40 [=====] - 21s 532ms/step - loss: 0.8720 - accuracy: 0.6837 - balanced\_recall: 0.1524 - balanced\_precision: 0.2491 - balanced\_f1\_score: 0.1871 - val\_loss: 0.9134 - val\_accuracy: 0.6803 - val\_balanced\_recall: 0.1470 - val\_balanced\_precision: 0.2250 - val\_balanced\_f1\_score: 0.1763

Epoch 8/20

40/40 [=====] - 19s 474ms/step - loss: 0.8507 - accuracy: 0.6868 - balanced\_recall: 0.1602 - balanced\_precision: 0.2585 - balanced\_f1\_score: 0.1952 - val\_loss: 0.8901 - val\_accuracy: 0.6803 - val\_balanced\_recall: 0.1555 - val\_balanced\_precision: 0.2452 - val\_balanced\_f1\_score: 0.1883

Epoch 9/20

40/40 [=====] - 19s 488ms/step - loss: 0.8133 - accuracy: 0.7096 - balanced\_recall: 0.1829 - balanced\_precision: 0.3031 - balanced\_f1\_score: 0.2261 - val\_loss: 0.8876 - val\_accuracy: 0.6740 - val\_balanced\_recall: 0.1591 - val\_balanced\_precision: 0.2335 - val\_balanced\_f1\_score: 0.1878

Epoch 10/20

40/40 [=====] - 21s 521ms/step - loss: 0.7930 - accuracy: 0.7049 - balanced\_recall: 0.1860 - balanced\_precision: 0.2938 - balanced\_f1\_score: 0.2255 - val\_loss: 0.8651 - val\_accuracy: 0.7053 - val\_balanced\_recall: 0.1689 - val\_balanced\_precision: 0.2615 - val\_balanced\_f1\_score: 0.2036

Epoch 11/20

40/40 [=====] - 21s 528ms/step - loss: 0.7875 - accuracy: 0.7206 - balanced\_recall: 0.1907 - balanced\_precision: 0.3041 - balanced\_f1\_score: 0.2326 - val\_loss: 0.8610 - val\_accuracy: 0.6928 - val\_balanced\_recall: 0.1656 - val\_balanced\_precision: 0.2761 - val\_balanced\_f1\_score: 0.2047

Epoch 12/20

40/40 [=====] - 21s 532ms/step - loss: 0.7638 - accuracy: 0.7292 - balanced\_recall: 0.2146 - balanced\_precision: 0.3270 - balanced\_f1\_score: 0.2567 - val\_loss: 0.8517 - val\_accuracy: 0.6834 - val\_balanced\_recall: 0.1759 - val\_balanced\_precision: 0.2812 - val\_balanced\_f1\_score: 0.2149

Epoch 13/20

40/40 [=====] - 19s 467ms/step - loss: 0.7372 - accuracy: 0.7308 - balanced\_recall: 0.2264 - balanced\_precision: 0.3563 - balanced\_f1\_score: 0.2743 - val\_loss: 0.8539 - val\_accuracy: 0.7022 - val\_balanced\_recall: 0.1908 - val\_balanced\_precision: 0.2609 - val\_balanced\_f1\_score: 0.2186

Epoch 14/20

40/40 [=====] - 19s 489ms/step - loss: 0.7345 - accuracy: 0.7370 - balanced\_recall: 0.2238 - balanced\_precision: 0.3547 - balanced\_f1\_score: 0.2729 - val\_loss: 0.8417 - val\_accuracy: 0.6834 - val\_balanced\_recall: 0.1883 - val\_balanced\_precision: 0.2827 - val\_balanced\_f1\_score: 0.2239

Epoch 15/20

40/40 [=====] - 17s 423ms/step - loss: 0.7133 - accuracy: 0.7480 - balanced\_recall: 0.2299 - balanced\_precision: 0.3401 - balanced\_f1\_score: 0.2723 - val\_loss: 0.8447 - val\_accuracy: 0.6865 - val\_balanced\_recall: 0.1831 - val\_balanced\_precision: 0.2847 - val\_balanced\_f1\_score: 0.2212

Epoch 16/20

40/40 [=====] - 21s 528ms/step - loss: 0.6952 - accuracy: 0.7504 - balanced\_recall: 0.2542 - balanced\_precision: 0.3602 - balanced\_f1\_score: 0.2955 - val\_loss: 0.8408 - val\_accuracy: 0.6708 - val\_balanced\_recall: 0.1782 - val\_balanced\_precision: 0.2742 - val\_balanced\_f1\_score: 0.2148

Epoch 17/20

40/40 [=====] - 21s 530ms/step - loss: 0.7037 - accuracy: 0.7535 - balanced\_recall: 0.2484 - balanced\_precision: 0.3660 - balanced\_f1\_score: 0.2943 -

val\_loss: 0.8306 - val\_accuracy: 0.6865 - val\_balanced\_recall: 0.1856 - val\_balanced\_precision:  
0.2847 - val\_balanced\_f1\_score: 0.2228

Epoch 18/20

40/40 [=====] - 21s 523ms/step - loss: 0.6819 - accuracy:  
0.7590 - balanced\_recall: 0.2482 - balanced\_precision: 0.3627 - balanced\_f1\_score: 0.2932 -  
val\_loss: 0.8278 - val\_accuracy: 0.6865 - val\_balanced\_recall: 0.1844 - val\_balanced\_precision:  
0.2950 - val\_balanced\_f1\_score: 0.2253

Epoch 19/20

40/40 [=====] - 20s 491ms/step - loss: 0.6731 - accuracy:  
0.7692 - balanced\_recall: 0.2615 - balanced\_precision: 0.3930 - balanced\_f1\_score: 0.3120 -  
val\_loss: 0.8265 - val\_accuracy: 0.6771 - val\_balanced\_recall: 0.1808 - val\_balanced\_precision:  
0.2871 - val\_balanced\_f1\_score: 0.2199

Epoch 20/20

40/40 [=====] - 17s 428ms/step - loss: 0.6791 - accuracy:  
0.7661 - balanced\_recall: 0.2598 - balanced\_precision: 0.3725 - balanced\_f1\_score: 0.3039 -  
val\_loss: 0.8338 - val\_accuracy: 0.6740 - val\_balanced\_recall: 0.1846 - val\_balanced\_precision:  
0.2911 - val\_balanced\_f1\_score: 0.2244

(Second run on training / retraining)

Epoch 1/20

40/40 [=====] - 30s 625ms/step - loss: 0.6600 - accuracy:  
0.7645 - balanced\_recall: 0.2872 - balanced\_precision: 0.3997 - balanced\_f1\_score: 0.3328 -  
val\_loss: 0.8150 - val\_accuracy: 0.6928 - val\_balanced\_recall: 0.1886 - val\_balanced\_precision:  
0.2938 - val\_balanced\_f1\_score: 0.2280

Epoch 2/20

40/40 [=====] - 19s 466ms/step - loss: 0.6456 - accuracy:  
0.7724 - balanced\_recall: 0.2821 - balanced\_precision: 0.3768 - balanced\_f1\_score: 0.3209 -  
val\_loss: 0.8164 - val\_accuracy: 0.6897 - val\_balanced\_recall: 0.1881 - val\_balanced\_precision:  
0.2997 - val\_balanced\_f1\_score: 0.2287

Epoch 3/20

40/40 [=====] - 19s 467ms/step - loss: 0.6575 - accuracy:  
0.7653 - balanced\_recall: 0.2776 - balanced\_precision: 0.3845 - balanced\_f1\_score: 0.3202 -  
val\_loss: 0.8188 - val\_accuracy: 0.6928 - val\_balanced\_recall: 0.1922 - val\_balanced\_precision:  
0.2861 - val\_balanced\_f1\_score: 0.2282

Epoch 4/20

40/40 [=====] - 20s 511ms/step - loss: 0.6285 - accuracy:  
0.7779 - balanced\_recall: 0.2884 - balanced\_precision: 0.4020 - balanced\_f1\_score: 0.3339 -  
val\_loss: 0.8237 - val\_accuracy: 0.7053 - val\_balanced\_recall: 0.1974 - val\_balanced\_precision:  
0.2527 - val\_balanced\_f1\_score: 0.2196

Epoch 1/20

40/40 [=====] - 29s 603ms/step - loss: 0.6498 - accuracy: 0.7747 - balanced\_recall: 0.2861 - balanced\_precision: 0.4000 - balanced\_f1\_score: 0.3318 - val\_loss: 0.8238 - val\_accuracy: 0.6928 - val\_balanced\_recall: 0.1851 - val\_balanced\_precision: 0.2878 - val\_balanced\_f1\_score: 0.2234

Epoch 2/20

40/40 [=====] - 21s 521ms/step - loss: 0.6352 - accuracy: 0.7755 - balanced\_recall: 0.2773 - balanced\_precision: 0.3861 - balanced\_f1\_score: 0.3207 - val\_loss: 0.8209 - val\_accuracy: 0.7053 - val\_balanced\_recall: 0.2046 - val\_balanced\_precision: 0.2926 - val\_balanced\_f1\_score: 0.2393

Epoch 3/20

40/40 [=====] - 22s 562ms/step - loss: 0.6306 - accuracy: 0.7771 - balanced\_recall: 0.2868 - balanced\_precision: 0.3969 - balanced\_f1\_score: 0.3316 - val\_loss: 0.8156 - val\_accuracy: 0.6959 - val\_balanced\_recall: 0.2021 - val\_balanced\_precision: 0.2961 - val\_balanced\_f1\_score: 0.2380

Epoch 4/20

40/40 [=====] - 19s 465ms/step - loss: 0.6287 - accuracy: 0.7865 - balanced\_recall: 0.2967 - balanced\_precision: 0.4046 - balanced\_f1\_score: 0.3399 - val\_loss: 0.8273 - val\_accuracy: 0.7022 - val\_balanced\_recall: 0.2246 - val\_balanced\_precision: 0.2955 - val\_balanced\_f1\_score: 0.2532

Epoch 5/20

40/40 [=====] - 19s 467ms/step - loss: 0.6335 - accuracy: 0.7763 - balanced\_recall: 0.2835 - balanced\_precision: 0.3846 - balanced\_f1\_score: 0.3247 - val\_loss: 0.8375 - val\_accuracy: 0.6646 - val\_balanced\_recall: 0.1879 - val\_balanced\_precision: 0.2943 - val\_balanced\_f1\_score: 0.2279

Epoch 6/20

40/40 [=====] - 20s 510ms/step - loss: 0.6034 - accuracy: 0.7881 - balanced\_recall: 0.3056 - balanced\_precision: 0.4148 - balanced\_f1\_score: 0.3495 - val\_loss: 0.8211 - val\_accuracy: 0.7053 - val\_balanced\_recall: 0.2087 - val\_balanced\_precision: 0.3007 - val\_balanced\_f1\_score: 0.2453

---

RELU Optimizer  
(initial training run)

Epoch 1/20

40/40 [=====] - 32s 669ms/step - loss: 0.6286 - accuracy: 0.7834 - balanced\_recall: 0.2720 - balanced\_precision: 0.3819 - balanced\_f1\_score: 0.3154 - val\_loss: 0.8228 - val\_accuracy: 0.7085 - val\_balanced\_recall: 0.2119 - val\_balanced\_precision: 0.3073 - val\_balanced\_f1\_score: 0.2491

Epoch 2/20



40/40 [=====] - 19s 469ms/step - loss: 0.5967 - accuracy: 0.7983 - balanced\_recall: 0.2982 - balanced\_precision: 0.3999 - balanced\_f1\_score: 0.3401 - val\_loss: 0.8318 - val\_accuracy: 0.6771 - val\_balanced\_recall: 0.1893 - val\_balanced\_precision: 0.2907 - val\_balanced\_f1\_score: 0.2276

Epoch 3/20

40/40 [=====] - 21s 525ms/step - loss: 0.6146 - accuracy: 0.7779 - balanced\_recall: 0.2948 - balanced\_precision: 0.4157 - balanced\_f1\_score: 0.3426 - val\_loss: 0.8214 - val\_accuracy: 0.7053 - val\_balanced\_recall: 0.2006 - val\_balanced\_precision: 0.2925 - val\_balanced\_f1\_score: 0.2364

Epoch 4/20

40/40 [=====] - 19s 465ms/step - loss: 0.6094 - accuracy: 0.7834 - balanced\_recall: 0.2916 - balanced\_precision: 0.3908 - balanced\_f1\_score: 0.3316 - val\_loss: 0.8288 - val\_accuracy: 0.6897 - val\_balanced\_recall: 0.2089 - val\_balanced\_precision: 0.2833 - val\_balanced\_f1\_score: 0.2389

Epoch 5/20

40/40 [=====] - 21s 539ms/step - loss: 0.6032 - accuracy: 0.7841 - balanced\_recall: 0.2987 - balanced\_precision: 0.4090 - balanced\_f1\_score: 0.3436 - val\_loss: 0.8159 - val\_accuracy: 0.7053 - val\_balanced\_recall: 0.2222 - val\_balanced\_precision: 0.3161 - val\_balanced\_f1\_score: 0.2586

Epoch 6/20

40/40 [=====] - 19s 468ms/step - loss: 0.5852 - accuracy: 0.7943 - balanced\_recall: 0.3070 - balanced\_precision: 0.4330 - balanced\_f1\_score: 0.3576 - val\_loss: 0.8272 - val\_accuracy: 0.7022 - val\_balanced\_recall: 0.2221 - val\_balanced\_precision: 0.2924 - val\_balanced\_f1\_score: 0.2509

Epoch 7/20

40/40 [=====] - 17s 422ms/step - loss: 0.5881 - accuracy: 0.8085 - balanced\_recall: 0.3135 - balanced\_precision: 0.4074 - balanced\_f1\_score: 0.3521 - val\_loss: 0.8220 - val\_accuracy: 0.6991 - val\_balanced\_recall: 0.2119 - val\_balanced\_precision: 0.3031 - val\_balanced\_f1\_score: 0.2470

Epoch 8/20

40/40 [=====] - 18s 460ms/step - loss: 0.5746 - accuracy: 0.8006 - balanced\_recall: 0.3204 - balanced\_precision: 0.4164 - balanced\_f1\_score: 0.3609 - val\_loss: 0.8245 - val\_accuracy: 0.6991 - val\_balanced\_recall: 0.2215 - val\_balanced\_precision: 0.2991 - val\_balanced\_f1\_score: 0.2533

---

RELU

```
activation_function = 'relu'  
batch_size = 32  
learning_rate = 0.001  
regularization = tf.keras.regularizers.l2(0.01)
```

Epoch 1/20

```
40/40 [=====] - 47s 613ms/step - loss: 1.4782 -  
accuracy: 0.4717 - balanced_recall: 0.0540 - balanced_precision: 0.0749 -  
balanced_f1_score: 0.0570 - val_loss: 1.2358 - val_accuracy: 0.5204 -  
val_balanced_recall: 0.0632 - val_balanced_precision: 0.0763 -  
val_balanced_f1_score: 0.0683
```

Epoch 2/20

```
40/40 [=====] - 20s 505ms/step - loss: 1.1565 -  
accuracy: 0.5385 - balanced_recall: 0.0886 - balanced_precision: 0.1040 -  
balanced_f1_score: 0.0923 - val_loss: 1.1247 - val_accuracy: 0.5517 -  
val_balanced_recall: 0.1006 - val_balanced_precision: 0.1550 -  
val_balanced_f1_score: 0.1186
```

Epoch 3/20

```
40/40 [=====] - 22s 547ms/step - loss: 1.0459 -  
accuracy: 0.5950 - balanced_recall: 0.1057 - balanced_precision: 0.1503 -  
balanced_f1_score: 0.1223 - val_loss: 1.0681 - val_accuracy: 0.5831 -  
val_balanced_recall: 0.1031 - val_balanced_precision: 0.1697 -  
val_balanced_f1_score: 0.1244
```

Epoch 4/20

```
40/40 [=====] - 18s 458ms/step - loss: 0.9820 -  
accuracy: 0.6122 - balanced_recall: 0.1179 - balanced_precision: 0.1708 -  
balanced_f1_score: 0.1377 - val_loss: 1.0181 - val_accuracy: 0.5987 -  
val_balanced_recall: 0.1178 - val_balanced_precision: 0.1687 -  
val_balanced_f1_score: 0.1353
```

Epoch 5/20

```
40/40 [=====] - 21s 536ms/step - loss: 0.9317 -  
accuracy: 0.6429 - balanced_recall: 0.1300 - balanced_precision: 0.1950 -  
balanced_f1_score: 0.1538 - val_loss: 0.9880 - val_accuracy: 0.6238 -  
val_balanced_recall: 0.1233 - val_balanced_precision: 0.1740 -  
val_balanced_f1_score: 0.1415
```

Epoch 6/20

40/40 [=====] - 20s 511ms/step - loss: 0.8783 -  
accuracy: 0.6688 - balanced\_recall: 0.1438 - balanced\_precision: 0.2265 -  
balanced\_f1\_score: 0.1739 - val\_loss: 0.9733 - val\_accuracy: 0.6176 -  
val\_balanced\_recall: 0.1344 - val\_balanced\_precision: 0.1867 -  
val\_balanced\_f1\_score: 0.1539

Epoch 7/20

40/40 [=====] - 22s 554ms/step - loss: 0.8361 -  
accuracy: 0.6900 - balanced\_recall: 0.1591 - balanced\_precision: 0.2440 -  
balanced\_f1\_score: 0.1905 - val\_loss: 0.9409 - val\_accuracy: 0.6583 -  
val\_balanced\_recall: 0.1452 - val\_balanced\_precision: 0.2161 -  
val\_balanced\_f1\_score: 0.1728

Epoch 8/20

40/40 [=====] - 21s 516ms/step - loss: 0.8205 -  
accuracy: 0.6978 - balanced\_recall: 0.1678 - balanced\_precision: 0.2651 -  
balanced\_f1\_score: 0.2036 - val\_loss: 0.9318 - val\_accuracy: 0.6583 -  
val\_balanced\_recall: 0.1509 - val\_balanced\_precision: 0.2294 -  
val\_balanced\_f1\_score: 0.1806

Epoch 9/20

40/40 [=====] - 22s 549ms/step - loss: 0.8040 -  
accuracy: 0.7017 - balanced\_recall: 0.1846 - balanced\_precision: 0.2757 -  
balanced\_f1\_score: 0.2190 - val\_loss: 0.9090 - val\_accuracy: 0.6677 -  
val\_balanced\_recall: 0.1596 - val\_balanced\_precision: 0.2541 -  
val\_balanced\_f1\_score: 0.1947

Epoch 10/20

40/40 [=====] - 21s 520ms/step - loss: 0.7688 -  
accuracy: 0.7245 - balanced\_recall: 0.1953 - balanced\_precision: 0.3020 -  
balanced\_f1\_score: 0.2347 - val\_loss: 0.9087 - val\_accuracy: 0.6771 -  
val\_balanced\_recall: 0.1579 - val\_balanced\_precision: 0.2289 -  
val\_balanced\_f1\_score: 0.1852

Epoch 11/20

40/40 [=====] - 22s 560ms/step - loss: 0.7511 -  
accuracy: 0.7166 - balanced\_recall: 0.2021 - balanced\_precision: 0.3121 -  
balanced\_f1\_score: 0.2432 - val\_loss: 0.8985 - val\_accuracy: 0.6740 -  
val\_balanced\_recall: 0.1687 - val\_balanced\_precision: 0.2474 -  
val\_balanced\_f1\_score: 0.1997

Epoch 12/20

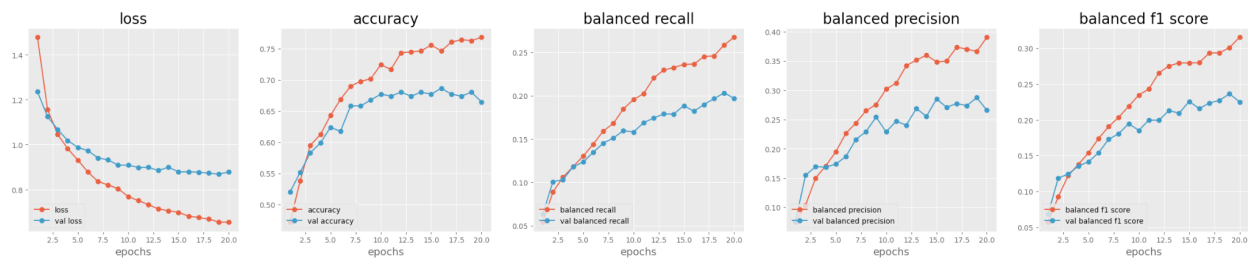
40/40 [=====] - 18s 460ms/step - loss: 0.7332 -  
accuracy: 0.7433 - balanced\_recall: 0.2202 - balanced\_precision: 0.3418 -  
balanced\_f1\_score: 0.2658 - val\_loss: 0.8990 - val\_accuracy: 0.6803 -

val\_balanced\_recall: 0.1740 - val\_balanced\_precision: 0.2403 -  
val\_balanced\_f1\_score: 0.1994  
Epoch 13/20  
40/40 [=====] - 21s 539ms/step - loss: 0.7139 -  
accuracy: 0.7449 - balanced\_recall: 0.2294 - balanced\_precision: 0.3516 -  
balanced\_f1\_score: 0.2754 - val\_loss: 0.8849 - val\_accuracy: 0.6740 -  
val\_balanced\_recall: 0.1788 - val\_balanced\_precision: 0.2689 -  
val\_balanced\_f1\_score: 0.2131  
Epoch 14/20  
40/40 [=====] - 18s 460ms/step - loss: 0.7057 -  
accuracy: 0.7465 - balanced\_recall: 0.2322 - balanced\_precision: 0.3597 -  
balanced\_f1\_score: 0.2797 - val\_loss: 0.8997 - val\_accuracy: 0.6803 -  
val\_balanced\_recall: 0.1786 - val\_balanced\_precision: 0.2553 -  
val\_balanced\_f1\_score: 0.2093  
Epoch 15/20  
40/40 [=====] - 21s 540ms/step - loss: 0.6987 -  
accuracy: 0.7559 - balanced\_recall: 0.2360 - balanced\_precision: 0.3484 -  
balanced\_f1\_score: 0.2795 - val\_loss: 0.8786 - val\_accuracy: 0.6771 -  
val\_balanced\_recall: 0.1884 - val\_balanced\_precision: 0.2851 -  
val\_balanced\_f1\_score: 0.2259  
Epoch 16/20  
40/40 [=====] - 18s 460ms/step - loss: 0.6814 -  
accuracy: 0.7465 - balanced\_recall: 0.2363 - balanced\_precision: 0.3499 -  
balanced\_f1\_score: 0.2800 - val\_loss: 0.8791 - val\_accuracy: 0.6865 -  
val\_balanced\_recall: 0.1818 - val\_balanced\_precision: 0.2710 -  
val\_balanced\_f1\_score: 0.2158  
Epoch 17/20  
40/40 [=====] - 21s 526ms/step - loss: 0.6756 -  
accuracy: 0.7606 - balanced\_recall: 0.2450 - balanced\_precision: 0.3734 -  
balanced\_f1\_score: 0.2936 - val\_loss: 0.8775 - val\_accuracy: 0.6771 -  
val\_balanced\_recall: 0.1897 - val\_balanced\_precision: 0.2773 -  
val\_balanced\_f1\_score: 0.2236  
Epoch 18/20  
40/40 [=====] - 22s 542ms/step - loss: 0.6686 -  
accuracy: 0.7645 - balanced\_recall: 0.2457 - balanced\_precision: 0.3702 -  
balanced\_f1\_score: 0.2937 - val\_loss: 0.8732 - val\_accuracy: 0.6740 -  
val\_balanced\_recall: 0.1964 - val\_balanced\_precision: 0.2737 -  
val\_balanced\_f1\_score: 0.2271  
Epoch 19/20

40/40 [=====] - 22s 544ms/step - loss: 0.6550 -  
accuracy: 0.7630 - balanced\_recall: 0.2584 - balanced\_precision: 0.3663 -  
balanced\_f1\_score: 0.3011 - val\_loss: 0.8688 - val\_accuracy: 0.6803 -  
val\_balanced\_recall: 0.2031 - val\_balanced\_precision: 0.2874 -  
val\_balanced\_f1\_score: 0.2365

Epoch 20/20

40/40 [=====] - 18s 461ms/step - loss: 0.6548 -  
accuracy: 0.7684 - balanced\_recall: 0.2673 - balanced\_precision: 0.3904 -  
balanced\_f1\_score: 0.3155 - val\_loss: 0.8785 - val\_accuracy: 0.6646 -  
val\_balanced\_recall: 0.1967 - val\_balanced\_precision: 0.2658 -  
val\_balanced\_f1\_score: 0.2252



ADAM Optimizer (6/26/2023)

Epoch 1/20

40/40 [=====] - 51s 689ms/step - loss: 1.4416 -  
accuracy: 0.4906 - balanced\_recall: 0.0592 - balanced\_precision: 0.0674 -  
balanced\_f1\_score: 0.0593 - val\_loss: 1.2560 - val\_accuracy: 0.4890 -  
val\_balanced\_recall: 0.0868 - val\_balanced\_precision: 0.0658 -  
val\_balanced\_f1\_score: 0.0739

Epoch 2/20

40/40 [=====] - 20s 490ms/step - loss: 1.1557 -  
accuracy: 0.5510 - balanced\_recall: 0.0922 - balanced\_precision: 0.1161 -  
balanced\_f1\_score: 0.0996 - val\_loss: 1.1407 - val\_accuracy: 0.5235 -  
val\_balanced\_recall: 0.0930 - val\_balanced\_precision: 0.1173 -  
val\_balanced\_f1\_score: 0.1000

Epoch 3/20

40/40 [=====] - 23s 570ms/step - loss: 1.0408 -  
accuracy: 0.5903 - balanced\_recall: 0.1085 - balanced\_precision: 0.1547 -  
balanced\_f1\_score: 0.1249 - val\_loss: 1.0761 - val\_accuracy: 0.5893 -

val\_balanced\_recall: 0.0956 - val\_balanced\_precision: 0.1236 -  
val\_balanced\_f1\_score: 0.1048  
Epoch 4/20  
40/40 [=====] - 20s 511ms/step - loss: 0.9643 -  
accuracy: 0.6287 - balanced\_recall: 0.1180 - balanced\_precision: 0.1702 -  
balanced\_f1\_score: 0.1370 - val\_loss: 1.0300 - val\_accuracy: 0.6176 -  
val\_balanced\_recall: 0.0978 - val\_balanced\_precision: 0.1532 -  
val\_balanced\_f1\_score: 0.1181  
Epoch 5/20  
40/40 [=====] - 24s 598ms/step - loss: 0.9214 -  
accuracy: 0.6295 - balanced\_recall: 0.1293 - balanced\_precision: 0.1921 -  
balanced\_f1\_score: 0.1532 - val\_loss: 1.0059 - val\_accuracy: 0.6270 -  
val\_balanced\_recall: 0.1097 - val\_balanced\_precision: 0.1642 -  
val\_balanced\_f1\_score: 0.1303  
Epoch 6/20  
40/40 [=====] - 20s 501ms/step - loss: 0.8863 -  
accuracy: 0.6531 - balanced\_recall: 0.1497 - balanced\_precision: 0.2326 -  
balanced\_f1\_score: 0.1793 - val\_loss: 0.9757 - val\_accuracy: 0.6489 -  
val\_balanced\_recall: 0.1309 - val\_balanced\_precision: 0.1791 -  
val\_balanced\_f1\_score: 0.1501  
Epoch 7/20  
40/40 [=====] - 23s 587ms/step - loss: 0.8457 -  
accuracy: 0.6790 - balanced\_recall: 0.1622 - balanced\_precision: 0.2656 -  
balanced\_f1\_score: 0.1986 - val\_loss: 0.9577 - val\_accuracy: 0.6489 -  
val\_balanced\_recall: 0.1447 - val\_balanced\_precision: 0.2093 -  
val\_balanced\_f1\_score: 0.1687  
Epoch 8/20  
40/40 [=====] - 20s 501ms/step - loss: 0.8116 -  
accuracy: 0.7025 - balanced\_recall: 0.1782 - balanced\_precision: 0.2674 -  
balanced\_f1\_score: 0.2116 - val\_loss: 0.9441 - val\_accuracy: 0.6677 -  
val\_balanced\_recall: 0.1586 - val\_balanced\_precision: 0.2520 -  
val\_balanced\_f1\_score: 0.1931  
Epoch 9/20  
40/40 [=====] - 23s 574ms/step - loss: 0.7810 -  
accuracy: 0.7182 - balanced\_recall: 0.1938 - balanced\_precision: 0.3122 -  
balanced\_f1\_score: 0.2364 - val\_loss: 0.9423 - val\_accuracy: 0.6583 -  
val\_balanced\_recall: 0.1586 - val\_balanced\_precision: 0.2172 -  
val\_balanced\_f1\_score: 0.1799  
Epoch 10/20

40/40 [=====] - 21s 516ms/step - loss: 0.7580 -  
accuracy: 0.7166 - balanced\_recall: 0.2099 - balanced\_precision: 0.3199 -  
balanced\_f1\_score: 0.2504 - val\_loss: 0.9307 - val\_accuracy: 0.6614 -  
val\_balanced\_recall: 0.1637 - val\_balanced\_precision: 0.2661 -  
val\_balanced\_f1\_score: 0.2010

Epoch 11/20

40/40 [=====] - 23s 587ms/step - loss: 0.7413 -  
accuracy: 0.7292 - balanced\_recall: 0.2045 - balanced\_precision: 0.3227 -  
balanced\_f1\_score: 0.2483 - val\_loss: 0.9165 - val\_accuracy: 0.6614 -  
val\_balanced\_recall: 0.1747 - val\_balanced\_precision: 0.2654 -  
val\_balanced\_f1\_score: 0.2098

Epoch 12/20

40/40 [=====] - 20s 515ms/step - loss: 0.7384 -  
accuracy: 0.7323 - balanced\_recall: 0.2106 - balanced\_precision: 0.3413 -  
balanced\_f1\_score: 0.2591 - val\_loss: 0.9139 - val\_accuracy: 0.6458 -  
val\_balanced\_recall: 0.1857 - val\_balanced\_precision: 0.2766 -  
val\_balanced\_f1\_score: 0.2208

Epoch 13/20

40/40 [=====] - 19s 477ms/step - loss: 0.7178 -  
accuracy: 0.7363 - balanced\_recall: 0.2265 - balanced\_precision: 0.3495 -  
balanced\_f1\_score: 0.2733 - val\_loss: 0.9156 - val\_accuracy: 0.6614 -  
val\_balanced\_recall: 0.1804 - val\_balanced\_precision: 0.2909 -  
val\_balanced\_f1\_score: 0.2198

Epoch 14/20

40/40 [=====] - 22s 562ms/step - loss: 0.7114 -  
accuracy: 0.7323 - balanced\_recall: 0.2307 - balanced\_precision: 0.3392 -  
balanced\_f1\_score: 0.2731 - val\_loss: 0.9049 - val\_accuracy: 0.6614 -  
val\_balanced\_recall: 0.1826 - val\_balanced\_precision: 0.2787 -  
val\_balanced\_f1\_score: 0.2190

Epoch 15/20

40/40 [=====] - 19s 478ms/step - loss: 0.6887 -  
accuracy: 0.7504 - balanced\_recall: 0.2433 - balanced\_precision: 0.3699 -  
balanced\_f1\_score: 0.2916 - val\_loss: 0.9094 - val\_accuracy: 0.6740 -  
val\_balanced\_recall: 0.1755 - val\_balanced\_precision: 0.2543 -  
val\_balanced\_f1\_score: 0.2062

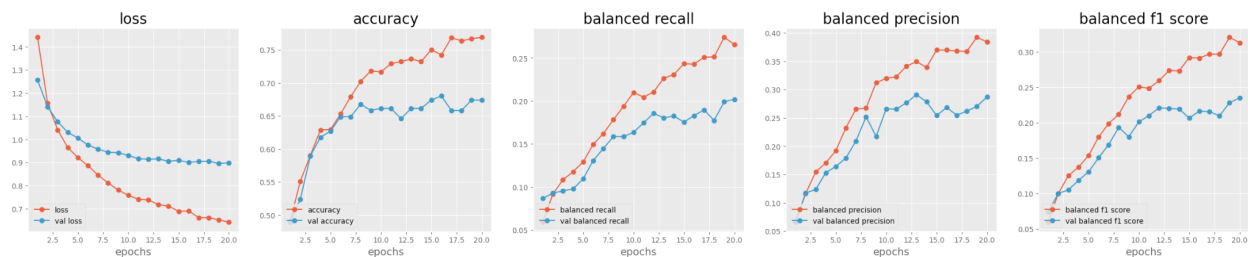
Epoch 16/20

40/40 [=====] - 22s 555ms/step - loss: 0.6908 -  
accuracy: 0.7425 - balanced\_recall: 0.2428 - balanced\_precision: 0.3699 -  
balanced\_f1\_score: 0.2910 - val\_loss: 0.9002 - val\_accuracy: 0.6803 -

```

val_balanced_recall: 0.1830 - val_balanced_precision: 0.2683 -
val_balanced_f1_score: 0.2162
Epoch 17/20
40/40 [=====] - 17s 430ms/step - loss: 0.6614 -
accuracy: 0.7684 - balanced_recall: 0.2509 - balanced_precision: 0.3682 -
balanced_f1_score: 0.2966 - val_loss: 0.9042 - val_accuracy: 0.6583 -
val_balanced_recall: 0.1897 - val_balanced_precision: 0.2549 -
val_balanced_f1_score: 0.2153
Epoch 18/20
40/40 [=====] - 19s 477ms/step - loss: 0.6615 -
accuracy: 0.7637 - balanced_recall: 0.2512 - balanced_precision: 0.3674 -
balanced_f1_score: 0.2964 - val_loss: 0.9060 - val_accuracy: 0.6583 -
val_balanced_recall: 0.1774 - val_balanced_precision: 0.2619 -
val_balanced_f1_score: 0.2094
Epoch 19/20
40/40 [=====] - 23s 570ms/step - loss: 0.6518 -
accuracy: 0.7669 - balanced_recall: 0.2741 - balanced_precision: 0.3925 -
balanced_f1_score: 0.3204 - val_loss: 0.8955 - val_accuracy: 0.6740 -
val_balanced_recall: 0.1991 - val_balanced_precision: 0.2705 -
val_balanced_f1_score: 0.2280
Epoch 20/20
40/40 [=====] - 19s 481ms/step - loss: 0.6419 -
accuracy: 0.7692 - balanced_recall: 0.2656 - balanced_precision: 0.3841 -
balanced_f1_score: 0.3125 - val_loss: 0.8985 - val_accuracy: 0.6740 -
val_balanced_recall: 0.2019 - val_balanced_precision: 0.2868 -
val_balanced_f1_score: 0.2348

```





RELU Activation

Balanced training ElSabry Large Categories

Epoch 1/10

22/22 [=====] - 42s 842ms/step - loss: 1.5851 -  
accuracy: 0.3476 - balanced\_recall: 0.0995 - balanced\_precision: 0.1512 -  
balanced\_f1\_score: 0.1108 - val\_loss: 1.2762 - val\_accuracy: 0.4824 -  
val\_balanced\_recall: 0.2170 - val\_balanced\_precision: 0.3806 -  
val\_balanced\_f1\_score: 0.2719

Epoch 2/10

22/22 [=====] - 12s 552ms/step - loss: 1.0614 -  
accuracy: 0.5979 - balanced\_recall: 0.2675 - balanced\_precision: 0.4737 -  
balanced\_f1\_score: 0.3380 - val\_loss: 1.1768 - val\_accuracy: 0.5471 -  
val\_balanced\_recall: 0.2396 - val\_balanced\_precision: 0.4344 -  
val\_balanced\_f1\_score: 0.3070

Epoch 3/10

22/22 [=====] - 9s 395ms/step - loss: 0.9029 -  
accuracy: 0.6657 - balanced\_recall: 0.3694 - balanced\_precision: 0.5615 -  
balanced\_f1\_score: 0.4420 - val\_loss: 1.2319 - val\_accuracy: 0.5706 -  
val\_balanced\_recall: 0.2941 - val\_balanced\_precision: 0.4624 -  
val\_balanced\_f1\_score: 0.3579

Epoch 4/10

22/22 [=====] - 10s 454ms/step - loss: 0.8283 -  
accuracy: 0.6892 - balanced\_recall: 0.4028 - balanced\_precision: 0.5619 -  
balanced\_f1\_score: 0.4665 - val\_loss: 1.2358 - val\_accuracy: 0.5588 -  
val\_balanced\_recall: 0.2935 - val\_balanced\_precision: 0.4647 -  
val\_balanced\_f1\_score: 0.3580

Epoch 5/10

22/22 [=====] - 11s 519ms/step - loss: 0.7599 -  
accuracy: 0.7202 - balanced\_recall: 0.4186 - balanced\_precision: 0.5883 -  
balanced\_f1\_score: 0.4860 - val\_loss: 1.2317 - val\_accuracy: 0.5588 -  
val\_balanced\_recall: 0.2895 - val\_balanced\_precision: 0.4325 -  
val\_balanced\_f1\_score: 0.3451

\*\*\*

Smaller ElSabry Balanced training (n=217 obs)

Epoch 1/10

6/6 [=====] - 42s 2s/step - loss: 1.8346 -  
accuracy: 0.2716 - balanced\_recall: 0.1363 - balanced\_precision: 0.1560 -  
balanced\_f1\_score: 0.1168 - val\_loss: 1.6033 - val\_accuracy: 0.3818 -  
val\_balanced\_recall: 0.1437 - val\_balanced\_precision: 0.2762 -  
val\_balanced\_f1\_score: 0.1891

Epoch 2/10

6/6 [=====] - 5s 829ms/step - loss: 1.2456 -  
accuracy: 0.4630 - balanced\_recall: 0.1829 - balanced\_precision: 0.3216 -  
balanced\_f1\_score: 0.2283 - val\_loss: 1.3706 - val\_accuracy: 0.5091 -  
val\_balanced\_recall: 0.1265 - val\_balanced\_precision: 0.3250 -  
val\_balanced\_f1\_score: 0.1713

Epoch 3/10

6/6 [=====] - 5s 928ms/step - loss: 1.0506 -  
accuracy: 0.6111 - balanced\_recall: 0.2470 - balanced\_precision: 0.5483 -  
balanced\_f1\_score: 0.3385 - val\_loss: 1.3250 - val\_accuracy: 0.5091 -  
val\_balanced\_recall: 0.2525 - val\_balanced\_precision: 0.3506 -  
val\_balanced\_f1\_score: 0.2804

Epoch 4/10

6/6 [=====] - 3s 425ms/step - loss: 0.9397 -  
accuracy: 0.6235 - balanced\_recall: 0.3434 - balanced\_precision: 0.5191 -  
balanced\_f1\_score: 0.4128 - val\_loss: 1.4337 - val\_accuracy: 0.4000 -  
val\_balanced\_recall: 0.2733 - val\_balanced\_precision: 0.3705 -  
val\_balanced\_f1\_score: 0.3034

Epoch 5/10

6/6 [=====] - 5s 925ms/step - loss: 0.8823 -  
accuracy: 0.6667 - balanced\_recall: 0.3933 - balanced\_precision: 0.6955 -  
balanced\_f1\_score: 0.5011 - val\_loss: 1.3024 - val\_accuracy: 0.4364 -  
val\_balanced\_recall: 0.2777 - val\_balanced\_precision: 0.4458 -  
val\_balanced\_f1\_score: 0.3339

Epoch 6/10

6/6 [=====] - 2s 368ms/step - loss: 0.7441 -  
accuracy: 0.7222 - balanced\_recall: 0.5190 - balanced\_precision: 0.7924 -  
balanced\_f1\_score: 0.6232 - val\_loss: 1.3952 - val\_accuracy: 0.5091 -  
val\_balanced\_recall: 0.2939 - val\_balanced\_precision: 0.2407 -  
val\_balanced\_f1\_score: 0.2646

Epoch 7/10

6/6 [=====] - 5s 885ms/step - loss: 0.7900 -  
accuracy: 0.7037 - balanced\_recall: 0.4706 - balanced\_precision: 0.6188 -  
balanced\_f1\_score: 0.5320 - val\_loss: 1.2530 - val\_accuracy: 0.4727 -  
val\_balanced\_recall: 0.2933 - val\_balanced\_precision: 0.3550 -  
val\_balanced\_f1\_score: 0.3152

Epoch 8/10

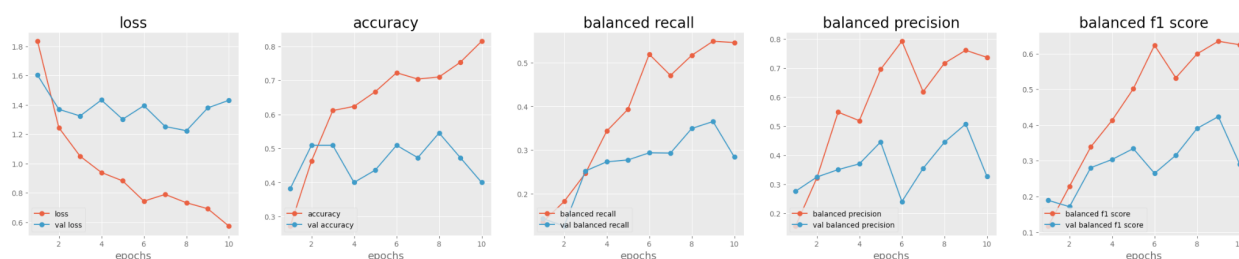
6/6 [=====] - 5s 879ms/step - loss: 0.7329 -  
accuracy: 0.7099 - balanced\_recall: 0.5165 - balanced\_precision: 0.7167 -  
balanced\_f1\_score: 0.5990 - val\_loss: 1.2244 - val\_accuracy: 0.5455 -  
val\_balanced\_recall: 0.3495 - val\_balanced\_precision: 0.4448 -  
val\_balanced\_f1\_score: 0.3905

Epoch 9/10

6/6 [=====] - 2s 395ms/step - loss: 0.6926 -  
accuracy: 0.7531 - balanced\_recall: 0.5486 - balanced\_precision: 0.7612 -  
balanced\_f1\_score: 0.6345 - val\_loss: 1.3797 - val\_accuracy: 0.4727 -  
val\_balanced\_recall: 0.3654 - val\_balanced\_precision: 0.5076 -  
val\_balanced\_f1\_score: 0.4235

Epoch 10/10

6/6 [=====] - 2s 373ms/step - loss: 0.5734 -  
accuracy: 0.8148 - balanced\_recall: 0.5456 - balanced\_precision: 0.7369 -  
balanced\_f1\_score: 0.6246 - val\_loss: 1.4320 - val\_accuracy: 0.4000 -  
val\_balanced\_recall: 0.2844 - val\_balanced\_precision: 0.3271 -  
val\_balanced\_f1\_score: 0.2907



RETRAINED (RUN #2)

Epoch 1/10

6/6 [=====] - 16s 2s/step - loss: 0.6414 -  
accuracy: 0.7531 - balanced\_recall: 0.5629 - balanced\_precision: 0.7027 -  
balanced\_f1\_score: 0.6225 - val\_loss: 1.4758 - val\_accuracy: 0.4727 -  
val\_balanced\_recall: 0.3706 - val\_balanced\_precision: 0.3479 -  
val\_balanced\_f1\_score: 0.3559

Epoch 2/10

6/6 [=====] - 5s 961ms/step - loss: 0.5165 -  
accuracy: 0.8395 - balanced\_recall: 0.6782 - balanced\_precision: 0.8197 -  
balanced\_f1\_score: 0.7412 - val\_loss: 1.2909 - val\_accuracy: 0.5273 -  
val\_balanced\_recall: 0.3288 - val\_balanced\_precision: 0.3898 -  
val\_balanced\_f1\_score: 0.3532

Epoch 3/10

6/6 [=====] - 2s 401ms/step - loss: 0.4581 -  
accuracy: 0.8333 - balanced\_recall: 0.6122 - balanced\_precision: 0.7823 -  
balanced\_f1\_score: 0.6828 - val\_loss: 1.3647 - val\_accuracy: 0.5273 -  
val\_balanced\_recall: 0.4207 - val\_balanced\_precision: 0.5679 -  
val\_balanced\_f1\_score: 0.4831

Epoch 4/10

6/6 [=====] - 5s 1s/step - loss: 0.3850 -  
accuracy: 0.9012 - balanced\_recall: 0.7613 - balanced\_precision: 0.8531 -  
balanced\_f1\_score: 0.8024 - val\_loss: 1.1919 - val\_accuracy: 0.5273 -  
val\_balanced\_recall: 0.3413 - val\_balanced\_precision: 0.4367 -  
val\_balanced\_f1\_score: 0.3799

Epoch 5/10

6/6 [=====] - 2s 386ms/step - loss: 0.3283 -  
accuracy: 0.9198 - balanced\_recall: 0.7614 - balanced\_precision: 0.8430 -  
balanced\_f1\_score: 0.7993 - val\_loss: 1.2925 - val\_accuracy: 0.5273 -  
val\_balanced\_recall: 0.3578 - val\_balanced\_precision: 0.3861 -  
val\_balanced\_f1\_score: 0.3684

Epoch 6/10

6/6 [=====] - 5s 904ms/step - loss: 0.3613 -  
accuracy: 0.8765 - balanced\_recall: 0.6808 - balanced\_precision: 0.7495 -  
balanced\_f1\_score: 0.7133 - val\_loss: 1.1671 - val\_accuracy: 0.5818 -  
val\_balanced\_recall: 0.4393 - val\_balanced\_precision: 0.6856 -  
val\_balanced\_f1\_score: 0.5354

Epoch 7/10

6/6 [=====] - 2s 396ms/step - loss: 0.3019 -  
accuracy: 0.9321 - balanced\_recall: 0.7616 - balanced\_precision: 0.8458 -  
balanced\_f1\_score: 0.8009 - val\_loss: 1.2002 - val\_accuracy: 0.5273 -

val\_balanced\_recall: 0.3649 - val\_balanced\_precision: 0.5057 -  
val\_balanced\_f1\_score: 0.4193  
Epoch 8/10  
6/6 [=====] - 2s 396ms/step - loss: 0.3186 -  
accuracy: 0.9259 - balanced\_recall: 0.8107 - balanced\_precision: 0.8473 -  
balanced\_f1\_score: 0.8285 - val\_loss: 1.3284 - val\_accuracy: 0.5091 -  
val\_balanced\_recall: 0.3696 - val\_balanced\_precision: 0.4299 -  
val\_balanced\_f1\_score: 0.3974

Epoch 9/10  
6/6 [=====] - 4s 727ms/step - loss: 0.2915 -  
accuracy: 0.9136 - balanced\_recall: 0.7518 - balanced\_precision: 0.8329 -  
balanced\_f1\_score: 0.7896 - val\_loss: 1.3167 - val\_accuracy: 0.5273 -  
val\_balanced\_recall: 0.4011 - val\_balanced\_precision: 0.5696 -  
val\_balanced\_f1\_score: 0.4702

---

RETRAINING (RUN #3)

Epoch 1/10  
6/6 [=====] - 17s 2s/step - loss: 0.3746 -  
accuracy: 0.8765 - balanced\_recall: 0.7624 - balanced\_precision: 0.8349 -  
balanced\_f1\_score: 0.7966 - val\_loss: 1.5938 - val\_accuracy: 0.4909 -  
val\_balanced\_recall: 0.3485 - val\_balanced\_precision: 0.4615 -  
val\_balanced\_f1\_score: 0.3971

Epoch 2/10  
6/6 [=====] - 5s 894ms/step - loss: 0.2833 -  
accuracy: 0.9506 - balanced\_recall: 0.7878 - balanced\_precision: 0.8503 -  
balanced\_f1\_score: 0.8167 - val\_loss: 1.1160 - val\_accuracy: 0.6182 -  
val\_balanced\_recall: 0.4979 - val\_balanced\_precision: 0.7700 -  
val\_balanced\_f1\_score: 0.6009

Epoch 3/10  
6/6 [=====] - 2s 410ms/step - loss: 0.2496 -  
accuracy: 0.9568 - balanced\_recall: 0.8172 - balanced\_precision: 0.8374 -  
balanced\_f1\_score: 0.8270 - val\_loss: 1.4960 - val\_accuracy: 0.4545 -  
val\_balanced\_recall: 0.3606 - val\_balanced\_precision: 0.5616 -  
val\_balanced\_f1\_score: 0.4385

Epoch 4/10

6/6 [=====] - 2s 411ms/step - loss: 0.3447 -  
accuracy: 0.8951 - balanced\_recall: 0.7205 - balanced\_precision: 0.7625 -  
balanced\_f1\_score: 0.7400 - val\_loss: 1.3960 - val\_accuracy: 0.5273 -  
val\_balanced\_recall: 0.4482 - val\_balanced\_precision: 0.6415 -  
val\_balanced\_f1\_score: 0.5276

Epoch 5/10

6/6 [=====] - 4s 778ms/step - loss: 0.3046 -  
accuracy: 0.9321 - balanced\_recall: 0.8050 - balanced\_precision: 0.8544 -  
balanced\_f1\_score: 0.8281 - val\_loss: 1.2056 - val\_accuracy: 0.6545 -  
val\_balanced\_recall: 0.4983 - val\_balanced\_precision: 0.7542 -  
val\_balanced\_f1\_score: 0.5985

---

RETRAINING (RUN #3)

Epoch 1/10

6/6 [=====] - 22s 4s/step - loss: 0.3500 -  
accuracy: 0.9012 - balanced\_recall: 0.7349 - balanced\_precision: 0.8314 -  
balanced\_f1\_score: 0.7793 - val\_loss: 1.1088 - val\_accuracy: 0.6000 -  
val\_balanced\_recall: 0.5207 - val\_balanced\_precision: 0.6468 -  
val\_balanced\_f1\_score: 0.5768

Epoch 2/10

6/6 [=====] - 3s 541ms/step - loss: 0.2590 -  
accuracy: 0.9321 - balanced\_recall: 0.8239 - balanced\_precision: 0.8741 -  
balanced\_f1\_score: 0.8479 - val\_loss: 1.3145 - val\_accuracy: 0.5818 -  
val\_balanced\_recall: 0.4817 - val\_balanced\_precision: 0.5217 -  
val\_balanced\_f1\_score: 0.5008

Epoch 3/10

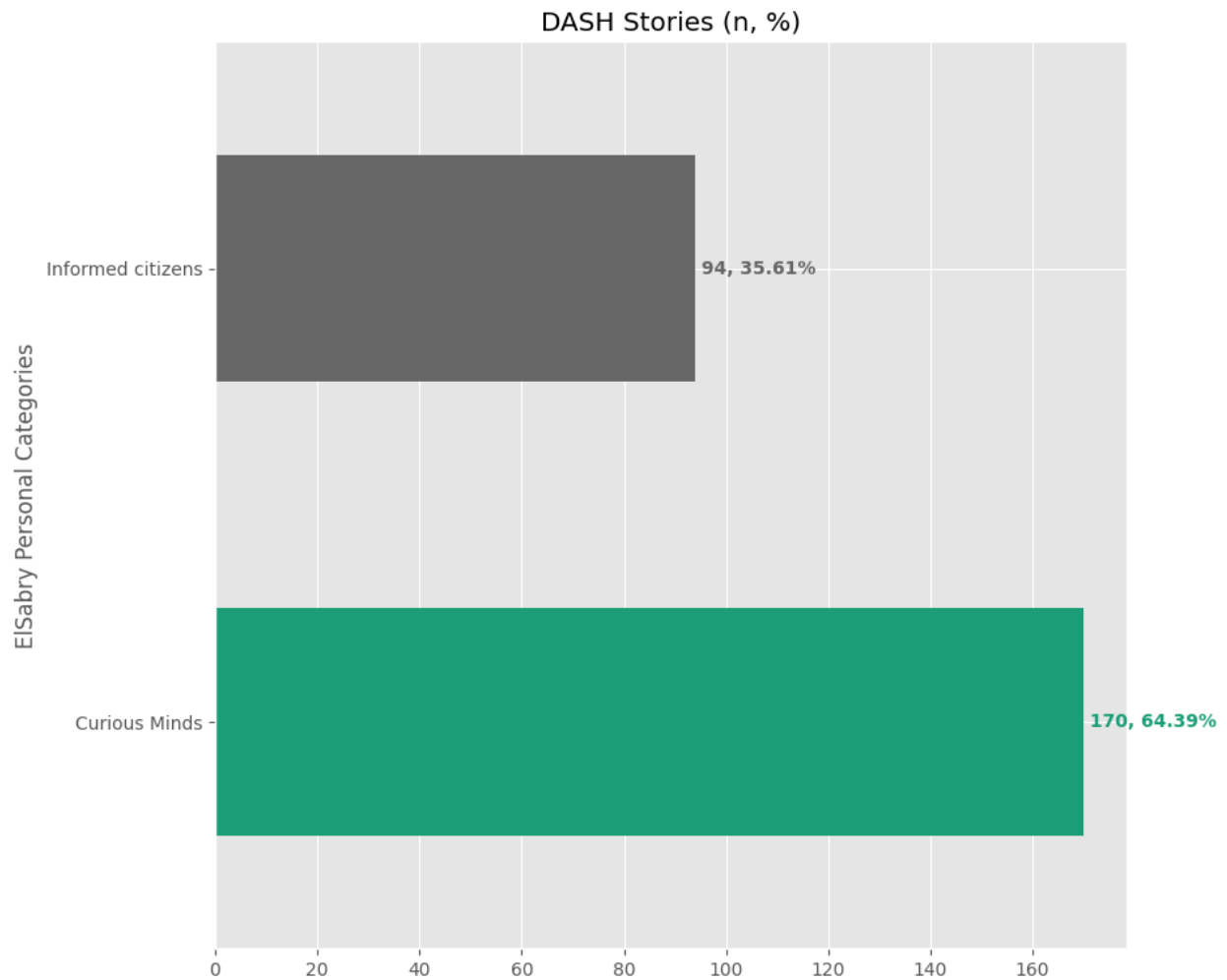
6/6 [=====] - 3s 437ms/step - loss: 0.2248 -  
accuracy: 0.9630 - balanced\_recall: 0.8296 - balanced\_precision: 0.8743 -  
balanced\_f1\_score: 0.8506 - val\_loss: 1.4246 - val\_accuracy: 0.5636 -  
val\_balanced\_recall: 0.4540 - val\_balanced\_precision: 0.5542 -  
val\_balanced\_f1\_score: 0.4972

Epoch 4/10

6/6 [=====] - 4s 738ms/step - loss: 0.2322 -  
accuracy: 0.9259 - balanced\_recall: 0.7827 - balanced\_precision: 0.8383 -  
balanced\_f1\_score: 0.8091 - val\_loss: 1.2306 - val\_accuracy: 0.5818 -  
val\_balanced\_recall: 0.4743 - val\_balanced\_precision: 0.6902 -  
val\_balanced\_f1\_score: 0.5608

---

## ElSabry Personal Category



Epoch 1/15

7/7 [=====] - 36s 2s/step - loss: 0.6958 -  
accuracy: 0.5972 - balanced\_recall: 0.5130 - balanced\_precision: 0.5105 -  
balanced\_f1\_score: 0.5062 - val\_loss: 0.6161 - val\_accuracy: 0.6981 -  
val\_balanced\_recall: 0.6133 - val\_balanced\_precision: 0.5899 -  
val\_balanced\_f1\_score: 0.6013

Epoch 2/15

7/7 [=====] - 5s 799ms/step - loss: 0.6493 -  
accuracy: 0.6445 - balanced\_recall: 0.6105 - balanced\_precision: 0.6278 -  
balanced\_f1\_score: 0.6188 - val\_loss: 0.5474 - val\_accuracy: 0.8113 -  
val\_balanced\_recall: 0.5777 - val\_balanced\_precision: 0.6629 -  
val\_balanced\_f1\_score: 0.6125

Epoch 3/15

7/7 [=====] - 6s 988ms/step - loss: 0.6001 -  
accuracy: 0.6682 - balanced\_recall: 0.6397 - balanced\_precision: 0.6687 -  
balanced\_f1\_score: 0.6534 - val\_loss: 0.5317 - val\_accuracy: 0.8491 -  
val\_balanced\_recall: 0.6759 - val\_balanced\_precision: 0.7649 -  
val\_balanced\_f1\_score: 0.7166

Epoch 4/15

7/7 [=====] - 5s 798ms/step - loss: 0.5870 -  
accuracy: 0.7156 - balanced\_recall: 0.6609 - balanced\_precision: 0.7327 -  
balanced\_f1\_score: 0.6933 - val\_loss: 0.5013 - val\_accuracy: 0.8491 -  
val\_balanced\_recall: 0.6759 - val\_balanced\_precision: 0.7649 -  
val\_balanced\_f1\_score: 0.7166

Epoch 5/15

7/7 [=====] - 3s 413ms/step - loss: 0.5460 -  
accuracy: 0.7062 - balanced\_recall: 0.6882 - balanced\_precision: 0.7035 -  
balanced\_f1\_score: 0.6956 - val\_loss: 0.5027 - val\_accuracy: 0.8302 -  
val\_balanced\_recall: 0.6870 - val\_balanced\_precision: 0.7075 -  
val\_balanced\_f1\_score: 0.6970

Epoch 6/15

7/7 [=====] - 3s 408ms/step - loss: 0.5135 -  
accuracy: 0.7725 - balanced\_recall: 0.7458 - balanced\_precision: 0.7873 -  
balanced\_f1\_score: 0.7651 - val\_loss: 0.5141 - val\_accuracy: 0.8302 -  
val\_balanced\_recall: 0.7652 - val\_balanced\_precision: 0.7245 -  
val\_balanced\_f1\_score: 0.7443

Epoch 7/15

7/7 [=====] - 8s 1s/step - loss: 0.5229 -  
accuracy: 0.7725 - balanced\_recall: 0.7624 - balanced\_precision: 0.7755 -  
balanced\_f1\_score: 0.7688 - val\_loss: 0.4714 - val\_accuracy: 0.8868 -  
val\_balanced\_recall: 0.7474 - val\_balanced\_precision: 0.7821 -  
val\_balanced\_f1\_score: 0.7643

Epoch 8/15

7/7 [=====] - 3s 412ms/step - loss: 0.5029 -  
accuracy: 0.7820 - balanced\_recall: 0.7517 - balanced\_precision: 0.7849 -  
balanced\_f1\_score: 0.7675 - val\_loss: 0.4762 - val\_accuracy: 0.8302 -



val\_balanced\_recall: 0.7652 - val\_balanced\_precision: 0.7245 -  
val\_balanced\_f1\_score: 0.7443

Epoch 9/15

7/7 [=====] - 7s 1s/step - loss: 0.5088 -  
accuracy: 0.7820 - balanced\_recall: 0.7542 - balanced\_precision: 0.7711 -  
balanced\_f1\_score: 0.7624 - val\_loss: 0.4645 - val\_accuracy: 0.8302 -  
val\_balanced\_recall: 0.7652 - val\_balanced\_precision: 0.7245 -  
val\_balanced\_f1\_score: 0.7443

Epoch 10/15

7/7 [=====] - 3s 418ms/step - loss: 0.4618 -  
accuracy: 0.8246 - balanced\_recall: 0.8059 - balanced\_precision: 0.8262 -  
balanced\_f1\_score: 0.8157 - val\_loss: 0.4832 - val\_accuracy: 0.8302 -  
val\_balanced\_recall: 0.7909 - val\_balanced\_precision: 0.7278 -  
val\_balanced\_f1\_score: 0.7578

Epoch 11/15

7/7 [=====] - 7s 1s/step - loss: 0.4319 -  
accuracy: 0.8294 - balanced\_recall: 0.8126 - balanced\_precision: 0.8157 -  
balanced\_f1\_score: 0.8140 - val\_loss: 0.4522 - val\_accuracy: 0.8491 -  
val\_balanced\_recall: 0.7799 - val\_balanced\_precision: 0.7514 -  
val\_balanced\_f1\_score: 0.7651

Epoch 12/15

7/7 [=====] - 7s 1s/step - loss: 0.4517 -  
accuracy: 0.8152 - balanced\_recall: 0.7838 - balanced\_precision: 0.8080 -  
balanced\_f1\_score: 0.7952 - val\_loss: 0.4459 - val\_accuracy: 0.8868 -  
val\_balanced\_recall: 0.7999 - val\_balanced\_precision: 0.7999 -  
val\_balanced\_f1\_score: 0.7999

Epoch 13/15

7/7 [=====] - 7s 1s/step - loss: 0.4201 -  
accuracy: 0.8341 - balanced\_recall: 0.8098 - balanced\_precision: 0.8630 -  
balanced\_f1\_score: 0.8321 - val\_loss: 0.4295 - val\_accuracy: 0.8868 -  
val\_balanced\_recall: 0.7999 - val\_balanced\_precision: 0.7999 -  
val\_balanced\_f1\_score: 0.7999

Epoch 14/15

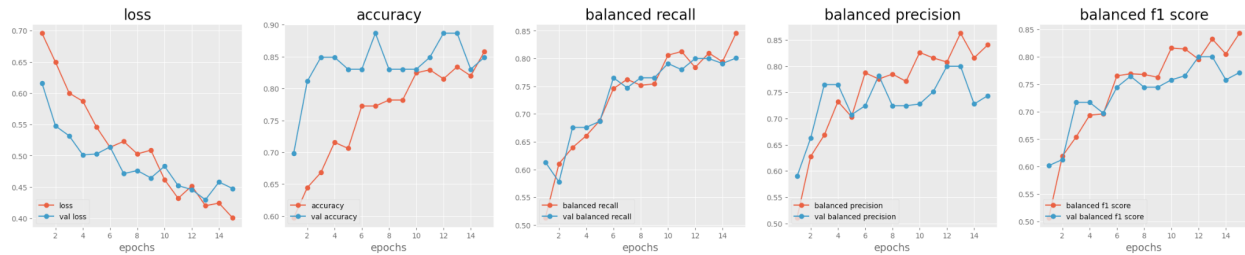
7/7 [=====] - 3s 479ms/step - loss: 0.4242 -  
accuracy: 0.8199 - balanced\_recall: 0.7941 - balanced\_precision: 0.8160 -  
balanced\_f1\_score: 0.8048 - val\_loss: 0.4579 - val\_accuracy: 0.8302 -  
val\_balanced\_recall: 0.7909 - val\_balanced\_precision: 0.7278 -  
val\_balanced\_f1\_score: 0.7578

Epoch 15/15

```

7/7 [=====] - 3s 417ms/step - loss: 0.4006 -
accuracy: 0.8578 - balanced_recall: 0.8455 - balanced_precision: 0.8407 -
balanced_f1_score: 0.8427 - val_loss: 0.4475 - val_accuracy: 0.8491 -
val_balanced_recall: 0.8009 - val_balanced_precision: 0.7437 -
val_balanced_f1_score: 0.771

```



Hicks - Information Activity

Epoch 1/15

```

2/2 [=====] - 36s 8s/step - loss: 1.8609 -
accuracy: 0.1389 - balanced_recall: 0.0000e+00 - balanced_precision:
0.0000e+00 - balanced_f1_score: 0.0000e+00 - val_loss: 1.6292 -
val_accuracy: 0.2222 - val_balanced_recall: 0.0000e+00 -
val_balanced_precision: 0.0000e+00 - val_balanced_f1_score: 0.0000e+00

```

Epoch 2/15

```

2/2 [=====] - 4s 3s/step - loss: 1.7011 -
accuracy: 0.2222 - balanced_recall: 0.0000e+00 - balanced_precision:
0.0000e+00 - balanced_f1_score: 0.0000e+00 - val_loss: 1.4758 -
val_accuracy: 0.4444 - val_balanced_recall: 0.0000e+00 -
val_balanced_precision: 0.0000e+00 - val_balanced_f1_score: 0.0000e+00

```

Epoch 3/15

```

2/2 [=====] - 5s 4s/step - loss: 1.5086 -
accuracy: 0.3056 - balanced_recall: 0.0071 - balanced_precision: 0.1000 -
balanced_f1_score: 0.0133 - val_loss: 1.3555 - val_accuracy: 0.6667 -
val_balanced_recall: 0.0000e+00 - val_balanced_precision: 0.0000e+00 -
val_balanced_f1_score: 0.0000e+00

```

Epoch 4/15

```

2/2 [=====] - 3s 3s/step - loss: 1.5277 -
accuracy: 0.3056 - balanced_recall: 0.0000e+00 - balanced_precision:
0.0000e+00 - balanced_f1_score: 0.0000e+00 - val_loss: 1.2394 -
val_accuracy: 0.6667 - val_balanced_recall: 0.0333 -
val_balanced_precision: 0.2000 - val_balanced_f1_score: 0.0571

```

Epoch 5/15

2/2 [=====] - 5s 5s/step - loss: 1.3349 -  
accuracy: 0.4444 - balanced\_recall: 0.0200 - balanced\_precision: 0.0750 -  
balanced\_f1\_score: 0.0316 - val\_loss: 1.1537 - val\_accuracy: 0.6667 -  
val\_balanced\_recall: 0.1000 - val\_balanced\_precision: 0.2000 -  
val\_balanced\_f1\_score: 0.1333

Epoch 6/15

2/2 [=====] - 3s 3s/step - loss: 1.3070 -  
accuracy: 0.5278 - balanced\_recall: 0.0567 - balanced\_precision: 0.1000 -  
balanced\_f1\_score: 0.0618 - val\_loss: 1.0877 - val\_accuracy: 0.6667 -  
val\_balanced\_recall: 0.1333 - val\_balanced\_precision: 0.2000 -  
val\_balanced\_f1\_score: 0.1600

Epoch 7/15

2/2 [=====] - 5s 5s/step - loss: 1.2688 -  
accuracy: 0.5278 - balanced\_recall: 0.0400 - balanced\_precision: 0.0667 -  
balanced\_f1\_score: 0.0500 - val\_loss: 1.0382 - val\_accuracy: 0.6667 -  
val\_balanced\_recall: 0.1333 - val\_balanced\_precision: 0.2000 -  
val\_balanced\_f1\_score: 0.1600

Epoch 8/15

2/2 [=====] - 4s 4s/step - loss: 1.2970 -  
accuracy: 0.5278 - balanced\_recall: 0.0563 - balanced\_precision: 0.0692 -  
balanced\_f1\_score: 0.0621 - val\_loss: 0.9979 - val\_accuracy: 0.6667 -  
val\_balanced\_recall: 0.1333 - val\_balanced\_precision: 0.2000 -  
val\_balanced\_f1\_score: 0.1600

Epoch 9/15

2/2 [=====] - 4s 4s/step - loss: 1.2738 -  
accuracy: 0.4722 - balanced\_recall: 0.1100 - balanced\_precision: 0.1192 -  
balanced\_f1\_score: 0.1143 - val\_loss: 0.9673 - val\_accuracy: 0.6667 -  
val\_balanced\_recall: 0.1667 - val\_balanced\_precision: 0.1667 -  
val\_balanced\_f1\_score: 0.1667

Epoch 10/15

2/2 [=====] - 4s 4s/step - loss: 1.1660 -  
accuracy: 0.5556 - balanced\_recall: 0.1625 - balanced\_precision: 0.1088 -  
balanced\_f1\_score: 0.1273 - val\_loss: 0.9435 - val\_accuracy: 0.6667 -  
val\_balanced\_recall: 0.1667 - val\_balanced\_precision: 0.1667 -  
val\_balanced\_f1\_score: 0.1667

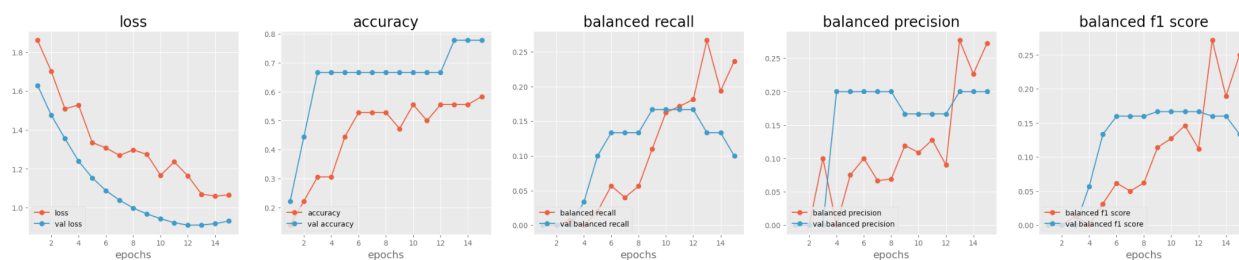
Epoch 11/15

2/2 [=====] - 5s 5s/step - loss: 1.2355 -  
accuracy: 0.5000 - balanced\_recall: 0.1714 - balanced\_precision: 0.1276 -  
balanced\_f1\_score: 0.1463 - val\_loss: 0.9225 - val\_accuracy: 0.6667 -

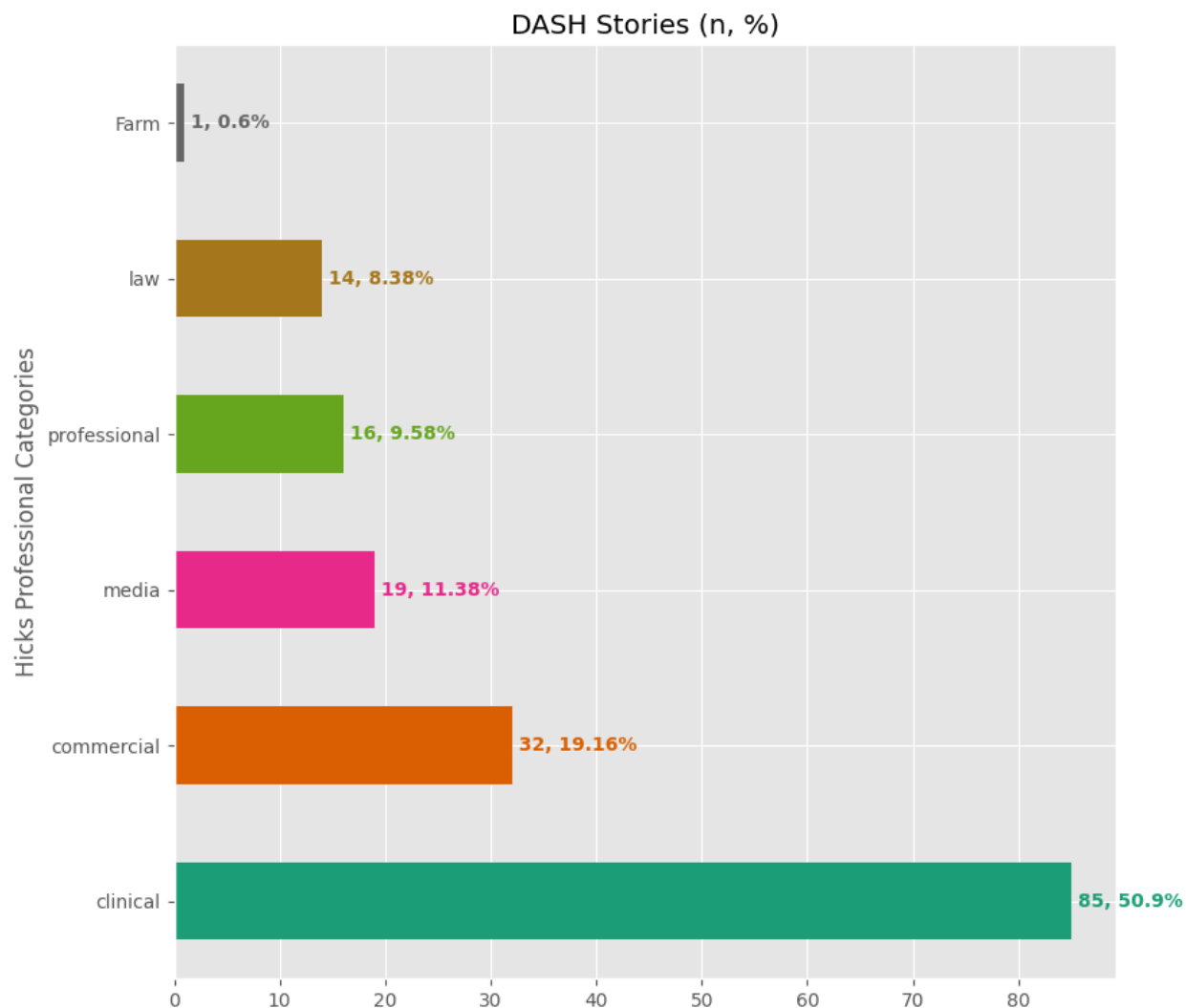
```

val_balanced_recall: 0.1667 - val_balanced_precision: 0.1667 -
val_balanced_f1_score: 0.1667
Epoch 12/15
2/2 [=====] - 4s 4s/step - loss: 1.1627 -
accuracy: 0.5556 - balanced_recall: 0.1812 - balanced_precision: 0.0900 -
balanced_f1_score: 0.1122 - val_loss: 0.9099 - val_accuracy: 0.6667 -
val_balanced_recall: 0.1667 - val_balanced_precision: 0.1667 -
val_balanced_f1_score: 0.1667
Epoch 13/15
2/2 [=====] - 1s 172ms/step - loss: 1.0693 -
accuracy: 0.5556 - balanced_recall: 0.2667 - balanced_precision: 0.2769 -
balanced_f1_score: 0.2714 - val_loss: 0.9107 - val_accuracy: 0.7778 -
val_balanced_recall: 0.1333 - val_balanced_precision: 0.2000 -
val_balanced_f1_score: 0.1600
Epoch 14/15
2/2 [=====] - 1s 218ms/step - loss: 1.0596 -
accuracy: 0.5556 - balanced_recall: 0.1937 - balanced_precision: 0.2265 -
balanced_f1_score: 0.1891 - val_loss: 0.9177 - val_accuracy: 0.7778 -
val_balanced_recall: 0.1333 - val_balanced_precision: 0.2000 -
val_balanced_f1_score: 0.1600
Epoch 15/15
2/2 [=====] - 2s 2s/step - loss: 1.0659 -
accuracy: 0.5833 - balanced_recall: 0.2367 - balanced_precision: 0.2722 -
balanced_f1_score: 0.2502 - val_loss: 0.9313 - val_accuracy: 0.7778 -
val_balanced_recall: 0.1000 - val_balanced_precision: 0.2000 -
val_balanced_f1_score: 0.1333

```



Hicks Professional Training



Epoch 1/15

5/5 [=====] - 15s 2s/step - loss: 0.8607 -  
accuracy: 0.6767 - balanced\_recall: 0.2330 - balanced\_precision: 0.3818 -  
balanced\_f1\_score: 0.2846 - val\_loss: 1.1039 - val\_accuracy: 0.5294 -  
val\_balanced\_recall: 0.1774 - val\_balanced\_precision: 0.1820 -  
val\_balanced\_f1\_score: 0.1796

Epoch 2/15

5/5 [=====] - 4s 993ms/step - loss: 0.8065 -  
accuracy: 0.7218 - balanced\_recall: 0.1684 - balanced\_precision: 0.2137 -  
balanced\_f1\_score: 0.1840 - val\_loss: 1.1017 - val\_accuracy: 0.5588 -  
val\_balanced\_recall: 0.1940 - val\_balanced\_precision: 0.1991 -  
val\_balanced\_f1\_score: 0.1965

Epoch 3/15

5/5 [=====] - 2s 419ms/step - loss: 0.7554 -  
accuracy: 0.7594 - balanced\_recall: 0.2807 - balanced\_precision: 0.3453 -  
balanced\_f1\_score: 0.3071 - val\_loss: 1.1017 - val\_accuracy: 0.6471 -  
val\_balanced\_recall: 0.1988 - val\_balanced\_precision: 0.2113 -  
val\_balanced\_f1\_score: 0.2047

Epoch 4/15

5/5 [=====] - 5s 1s/step - loss: 0.7312 -  
accuracy: 0.7820 - balanced\_recall: 0.2864 - balanced\_precision: 0.4600 -  
balanced\_f1\_score: 0.3469 - val\_loss: 1.0756 - val\_accuracy: 0.6471 -  
val\_balanced\_recall: 0.2048 - val\_balanced\_precision: 0.2125 -  
val\_balanced\_f1\_score: 0.2085

Epoch 5/15

5/5 [=====] - 4s 906ms/step - loss: 0.7121 -  
accuracy: 0.8120 - balanced\_recall: 0.2891 - balanced\_precision: 0.3893 -  
balanced\_f1\_score: 0.3276 - val\_loss: 1.0578 - val\_accuracy: 0.5882 -  
val\_balanced\_recall: 0.2107 - val\_balanced\_precision: 0.2135 -  
val\_balanced\_f1\_score: 0.2121

Epoch 6/15

5/5 [=====] - 4s 942ms/step - loss: 0.6954 -  
accuracy: 0.8045 - balanced\_recall: 0.3199 - balanced\_precision: 0.4491 -  
balanced\_f1\_score: 0.3734 - val\_loss: 1.0316 - val\_accuracy: 0.5588 -  
val\_balanced\_recall: 0.1940 - val\_balanced\_precision: 0.2026 -  
val\_balanced\_f1\_score: 0.1982

Epoch 7/15

5/5 [=====] - 4s 899ms/step - loss: 0.6764 -  
accuracy: 0.7744 - balanced\_recall: 0.2601 - balanced\_precision: 0.3529 -  
balanced\_f1\_score: 0.2954 - val\_loss: 1.0047 - val\_accuracy: 0.6471 -  
val\_balanced\_recall: 0.2107 - val\_balanced\_precision: 0.2135 -  
val\_balanced\_f1\_score: 0.2121

Epoch 8/15

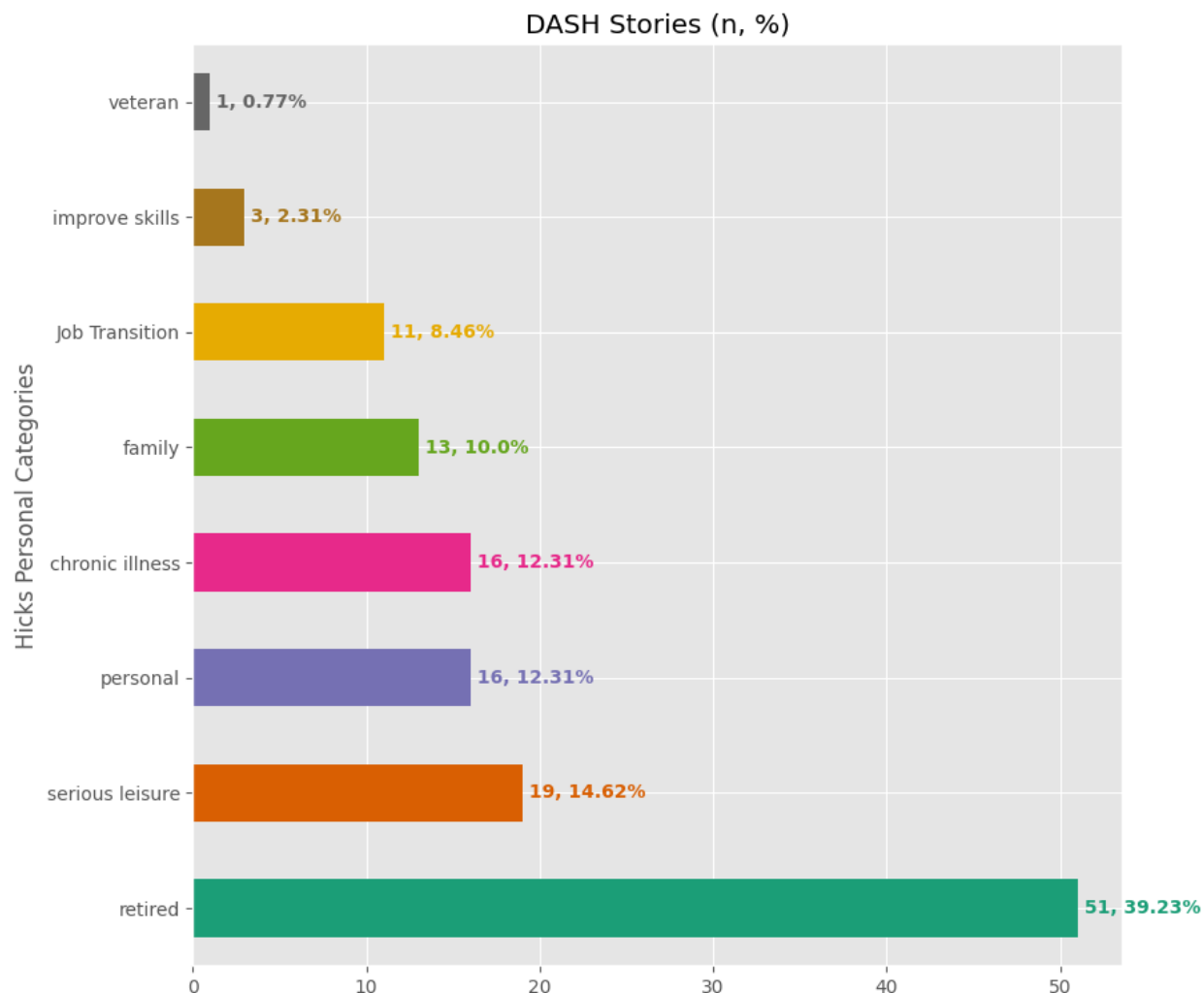
5/5 [=====] - 4s 935ms/step - loss: 0.6589 -  
accuracy: 0.7970 - balanced\_recall: 0.3439 - balanced\_precision: 0.4586 -  
balanced\_f1\_score: 0.3918 - val\_loss: 0.9772 - val\_accuracy: 0.6765 -  
val\_balanced\_recall: 0.2048 - val\_balanced\_precision: 0.2125 -  
val\_balanced\_f1\_score: 0.2085

Epoch 9/15

5/5 [=====] - 4s 1s/step - loss: 0.6446 -  
accuracy: 0.8120 - balanced\_recall: 0.3499 - balanced\_precision: 0.4900 -  
balanced\_f1\_score: 0.4049 - val\_loss: 0.9715 - val\_accuracy: 0.7353 -

```
val_balanced_recall: 0.2048 - val_balanced_precision: 0.2125 -  
val_balanced_f1_score: 0.2085  
Epoch 10/15  
5/5 [=====] - 4s 954ms/step - loss: 0.6415 -  
accuracy: 0.8421 - balanced_recall: 0.3585 - balanced_precision: 0.4884 -  
balanced_f1_score: 0.4130 - val_loss: 0.9604 - val_accuracy: 0.7647 -  
val_balanced_recall: 0.2107 - val_balanced_precision: 0.2135 -  
val_balanced_f1_score: 0.2121  
Epoch 11/15  
5/5 [=====] - 4s 846ms/step - loss: 0.5918 -  
accuracy: 0.8496 - balanced_recall: 0.3422 - balanced_precision: 0.4130 -  
balanced_f1_score: 0.3719 - val_loss: 0.9518 - val_accuracy: 0.7059 -  
val_balanced_recall: 0.2048 - val_balanced_precision: 0.2125 -  
val_balanced_f1_score: 0.2085  
Epoch 12/15  
5/5 [=====] - 2s 414ms/step - loss: 0.5662 -  
accuracy: 0.8797 - balanced_recall: 0.3886 - balanced_precision: 0.5246 -  
balanced_f1_score: 0.4445 - val_loss: 0.9604 - val_accuracy: 0.6471 -  
val_balanced_recall: 0.2048 - val_balanced_precision: 0.2125 -  
val_balanced_f1_score: 0.2085  
Epoch 13/15  
5/5 [=====] - 2s 443ms/step - loss: 0.5793 -  
accuracy: 0.8647 - balanced_recall: 0.3349 - balanced_precision: 0.4600 -  
balanced_f1_score: 0.3855 - val_loss: 0.9773 - val_accuracy: 0.5882 -  
val_balanced_recall: 0.2048 - val_balanced_precision: 0.2173 -  
val_balanced_f1_score: 0.2107  
Epoch 14/15  
5/5 [=====] - 4s 895ms/step - loss: 0.5254 -  
accuracy: 0.8797 - balanced_recall: 0.4666 - balanced_precision: 0.5864 -  
balanced_f1_score: 0.5173 - val_loss: 0.9573 - val_accuracy: 0.6471 -  
val_balanced_recall: 0.2107 - val_balanced_precision: 0.2135 -  
val_balanced_f1_score: 0.2121
```

HICKS PERSONAL



Epoch 1/20

4/4 [=====] - 23s 6s/step - loss: 0.9500 -  
accuracy: 0.6827 - balanced\_recall: 0.1543 - balanced\_precision: 0.2687 -  
balanced\_f1\_score: 0.1956 - val\_loss: 1.2433 - val\_accuracy: 0.5000 -  
val\_balanced\_recall: 0.0455 - val\_balanced\_precision: 0.1000 -  
val\_balanced\_f1\_score: 0.0625

Epoch 2/20

4/4 [=====] - 4s 1s/step - loss: 0.8990 -  
accuracy: 0.7404 - balanced\_recall: 0.2069 - balanced\_precision: 0.3966 -  
balanced\_f1\_score: 0.2702 - val\_loss: 1.2189 - val\_accuracy: 0.4615 -  
val\_balanced\_recall: 0.0568 - val\_balanced\_precision: 0.0893 -  
val\_balanced\_f1\_score: 0.0694

Epoch 3/20



4/4 [=====] - 12s 4s/step - loss: 0.8713 -  
accuracy: 0.7308 - balanced\_recall: 0.2763 - balanced\_precision: 0.4245 -  
balanced\_f1\_score: 0.3331 - val\_loss: 1.2036 - val\_accuracy: 0.5000 -  
val\_balanced\_recall: 0.0682 - val\_balanced\_precision: 0.0938 -  
val\_balanced\_f1\_score: 0.0789

Epoch 4/20

4/4 [=====] - 3s 1000ms/step - loss: 0.8302 -  
accuracy: 0.7404 - balanced\_recall: 0.2966 - balanced\_precision: 0.4852 -  
balanced\_f1\_score: 0.3654 - val\_loss: 1.1838 - val\_accuracy: 0.5000 -  
val\_balanced\_recall: 0.0682 - val\_balanced\_precision: 0.0833 -  
val\_balanced\_f1\_score: 0.0750

Epoch 5/20

4/4 [=====] - 13s 4s/step - loss: 0.8203 -  
accuracy: 0.7404 - balanced\_recall: 0.2811 - balanced\_precision: 0.4467 -  
balanced\_f1\_score: 0.3427 - val\_loss: 1.1680 - val\_accuracy: 0.5000 -  
val\_balanced\_recall: 0.1212 - val\_balanced\_precision: 0.2125 -  
val\_balanced\_f1\_score: 0.1544

Epoch 6/20

4/4 [=====] - 3s 1s/step - loss: 0.7844 -  
accuracy: 0.7404 - balanced\_recall: 0.2568 - balanced\_precision: 0.3972 -  
balanced\_f1\_score: 0.3102 - val\_loss: 1.1566 - val\_accuracy: 0.5000 -  
val\_balanced\_recall: 0.0795 - val\_balanced\_precision: 0.0875 -  
val\_balanced\_f1\_score: 0.0833

Epoch 7/20

4/4 [=====] - 2s 498ms/step - loss: 0.7241 -  
accuracy: 0.7981 - balanced\_recall: 0.3549 - balanced\_precision: 0.4872 -  
balanced\_f1\_score: 0.4078 - val\_loss: 1.1605 - val\_accuracy: 0.5385 -  
val\_balanced\_recall: 0.0568 - val\_balanced\_precision: 0.1042 -  
val\_balanced\_f1\_score: 0.0735

Epoch 8/20

4/4 [=====] - 2s 522ms/step - loss: 0.7218 -  
accuracy: 0.8365 - balanced\_recall: 0.3242 - balanced\_precision: 0.4582 -  
balanced\_f1\_score: 0.3764 - val\_loss: 1.1566 - val\_accuracy: 0.5385 -  
val\_balanced\_recall: 0.0985 - val\_balanced\_precision: 0.2500 -  
val\_balanced\_f1\_score: 0.1413

Epoch 9/20

4/4 [=====] - 11s 4s/step - loss: 0.7105 -  
accuracy: 0.8269 - balanced\_recall: 0.3906 - balanced\_precision: 0.5851 -  
balanced\_f1\_score: 0.4670 - val\_loss: 1.1435 - val\_accuracy: 0.5385 -

val\_balanced\_recall: 0.0871 - val\_balanced\_precision: 0.2500 -  
val\_balanced\_f1\_score: 0.1292  
Epoch 10/20  
4/4 [=====] - 4s 1s/step - loss: 0.6621 -  
accuracy: 0.8654 - balanced\_recall: 0.3615 - balanced\_precision: 0.5938 -  
balanced\_f1\_score: 0.4452 - val\_loss: 1.1394 - val\_accuracy: 0.5385 -  
val\_balanced\_recall: 0.1174 - val\_balanced\_precision: 0.3750 -  
val\_balanced\_f1\_score: 0.1788  
Epoch 11/20  
4/4 [=====] - 12s 4s/step - loss: 0.6638 -  
accuracy: 0.9038 - balanced\_recall: 0.3720 - balanced\_precision: 0.4938 -  
balanced\_f1\_score: 0.4213 - val\_loss: 1.1280 - val\_accuracy: 0.5000 -  
val\_balanced\_recall: 0.1591 - val\_balanced\_precision: 0.5000 -  
val\_balanced\_f1\_score: 0.2414  
Epoch 12/20  
4/4 [=====] - 3s 993ms/step - loss: 0.6296 -  
accuracy: 0.8365 - balanced\_recall: 0.4263 - balanced\_precision: 0.5917 -  
balanced\_f1\_score: 0.4925 - val\_loss: 1.1004 - val\_accuracy: 0.5000 -  
val\_balanced\_recall: 0.1932 - val\_balanced\_precision: 0.4821 -  
val\_balanced\_f1\_score: 0.2758  
Epoch 13/20  
4/4 [=====] - 12s 4s/step - loss: 0.6140 -  
accuracy: 0.8942 - balanced\_recall: 0.4132 - balanced\_precision: 0.5880 -  
balanced\_f1\_score: 0.4835 - val\_loss: 1.0848 - val\_accuracy: 0.5385 -  
val\_balanced\_recall: 0.2045 - val\_balanced\_precision: 0.4844 -  
val\_balanced\_f1\_score: 0.2876  
Epoch 14/20  
4/4 [=====] - 3s 1s/step - loss: 0.5762 -  
accuracy: 0.8846 - balanced\_recall: 0.4505 - balanced\_precision: 0.5863 -  
balanced\_f1\_score: 0.5073 - val\_loss: 1.0716 - val\_accuracy: 0.5769 -  
val\_balanced\_recall: 0.2045 - val\_balanced\_precision: 0.4844 -  
val\_balanced\_f1\_score: 0.2876  
Epoch 15/20  
4/4 [=====] - 2s 373ms/step - loss: 0.5482 -  
accuracy: 0.9231 - balanced\_recall: 0.4231 - balanced\_precision: 0.5604 -  
balanced\_f1\_score: 0.4783 - val\_loss: 1.0745 - val\_accuracy: 0.6154 -  
val\_balanced\_recall: 0.1932 - val\_balanced\_precision: 0.5000 -  
val\_balanced\_f1\_score: 0.2787  
Epoch 16/20

4/4 [=====] - 1s 370ms/step - loss: 0.5553 -  
accuracy: 0.8942 - balanced\_recall: 0.4629 - balanced\_precision: 0.6151 -  
balanced\_f1\_score: 0.5268 - val\_loss: 1.0731 - val\_accuracy: 0.6154 -  
val\_balanced\_recall: 0.1932 - val\_balanced\_precision: 0.5000 -  
val\_balanced\_f1\_score: 0.2787

Epoch 17/20

4/4 [=====] - 12s 4s/step - loss: 0.5698 -  
accuracy: 0.9038 - balanced\_recall: 0.4755 - balanced\_precision: 0.6365 -  
balanced\_f1\_score: 0.5428 - val\_loss: 1.0589 - val\_accuracy: 0.6538 -  
val\_balanced\_recall: 0.1932 - val\_balanced\_precision: 0.5000 -  
val\_balanced\_f1\_score: 0.2787

Epoch 18/20

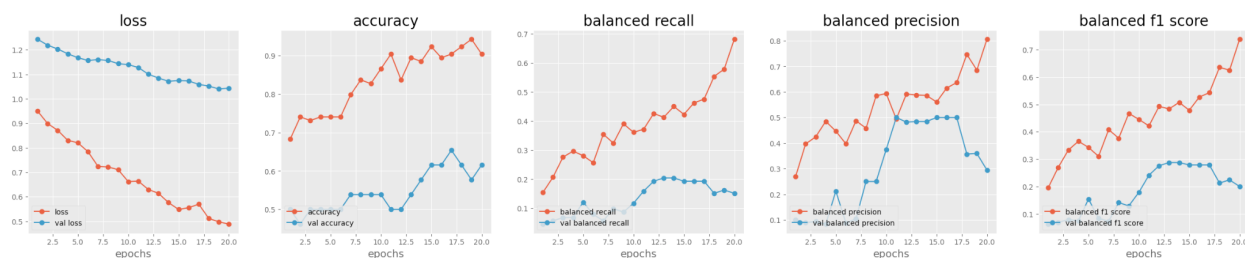
4/4 [=====] - 4s 1s/step - loss: 0.5112 -  
accuracy: 0.9231 - balanced\_recall: 0.5539 - balanced\_precision: 0.7465 -  
balanced\_f1\_score: 0.6352 - val\_loss: 1.0521 - val\_accuracy: 0.6154 -  
val\_balanced\_recall: 0.1515 - val\_balanced\_precision: 0.3571 -  
val\_balanced\_f1\_score: 0.2128

Epoch 19/20

4/4 [=====] - 14s 5s/step - loss: 0.4977 -  
accuracy: 0.9423 - balanced\_recall: 0.5790 - balanced\_precision: 0.6853 -  
balanced\_f1\_score: 0.6248 - val\_loss: 1.0400 - val\_accuracy: 0.5769 -  
val\_balanced\_recall: 0.1629 - val\_balanced\_precision: 0.3594 -  
val\_balanced\_f1\_score: 0.2242

Epoch 20/20

4/4 [=====] - 2s 480ms/step - loss: 0.4881 -  
accuracy: 0.9038 - balanced\_recall: 0.6818 - balanced\_precision: 0.8057 -  
balanced\_f1\_score: 0.7379 - val\_loss: 1.0438 - val\_accuracy: 0.6154 -  
val\_balanced\_recall: 0.1515 - val\_balanced\_precision: 0.2946 -  
val\_balanced\_f1\_score: 0.2001



## GPT-2 results for ElSabry Large Categories

100%|██████████| 87/87 [00:12<00:00, 7.05it/s]

Epochs: 1 | Train Loss: 18.275 | Train Accuracy: 0.249  
| Val Loss: 4.191 | Val Accuracy: 0.091

100%|██████████| 87/87 [00:11<00:00, 7.32it/s]

Epochs: 2 | Train Loss: 4.557 | Train Accuracy: 0.249  
| Val Loss: 5.134 | Val Accuracy: 0.091

100%|██████████| 87/87 [00:11<00:00, 7.31it/s]

Epochs: 3 | Train Loss: 1.907 | Train Accuracy: 0.324  
| Val Loss: 1.745 | Val Accuracy: 0.364

100%|██████████| 87/87 [00:12<00:00, 6.86it/s]

Epochs: 4 | Train Loss: 1.234 | Train Accuracy: 0.445  
| Val Loss: 1.717 | Val Accuracy: 0.318

100%|██████████| 87/87 [00:11<00:00, 7.32it/s]

Epochs: 5 | Train Loss: 1.020 | Train Accuracy: 0.486  
| Val Loss: 1.815 | Val Accuracy: 0.318

100%|██████████| 87/87 [00:11<00:00, 7.33it/s]

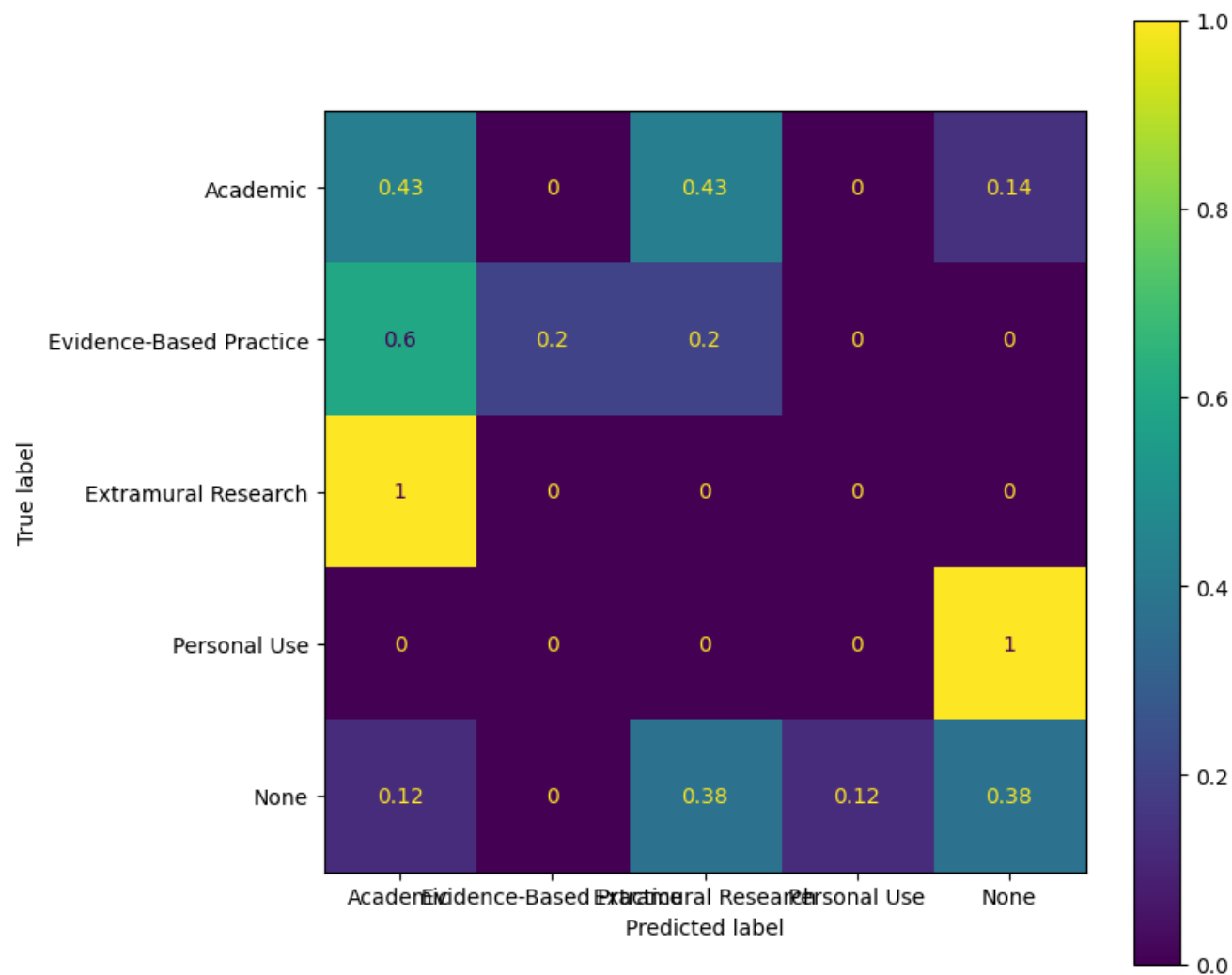
Epochs: 6 | Train Loss: 0.441 | Train Accuracy: 0.786  
| Val Loss: 2.237 | Val Accuracy: 0.182

100%|██████████| 87/87 [00:11<00:00, 7.34it/s]

Epochs: 7 | Train Loss: 0.234 | Train Accuracy: 0.861  
| Val Loss: 2.473 | Val Accuracy: 0.045

100%|██████████| 87/87 [00:11<00:00, 7.31it/s]


Epochs: 8 | Train Loss: 0.165 | Train Accuracy: 0.884  
| Val Loss: 1.891 | Val Accuracy: 0.318




GPT-2: EISabry Large Categories

100% ██████████ 87/87 [00:14<00:00, 6.18it/s]


Epochs: 1 | Train Loss: 28.287 | Train Accuracy: 0.225 | Val Loss: 11.249  
| Val Accuracy: 0.318

100% 87/87 [00:11<00:00, 7.76it/s]


Epochs: 2 | Train Loss: 6.978 | Train Accuracy: 0.295 | Val Loss: 6.567 |  
Val Accuracy: 0.136

100% 87/87 [00:11<00:00, 7.73it/s]


Epochs: 3 | Train Loss: 2.288 | Train Accuracy: 0.416 | Val Loss: 2.710 |  
Val Accuracy: 0.136

100% 87/87 [00:11<00:00, 7.65it/s]


Epochs: 4 | Train Loss: 1.637 | Train Accuracy: 0.445 | Val Loss: 2.843 |  
Val Accuracy: 0.091

100% 87/87 [00:11<00:00, 7.55it/s]


Epochs: 5 | Train Loss: 0.903 | Train Accuracy: 0.601 | Val Loss: 1.798 |  
Val Accuracy: 0.227

100% 87/87 [00:11<00:00, 7.35it/s]

Epochs: 6 | Train Loss: 0.452 | Train Accuracy: 0.734 | Val Loss: 1.693 |  
Val Accuracy: 0.136

100% 87/87 [00:12<00:00, 7.20it/s]

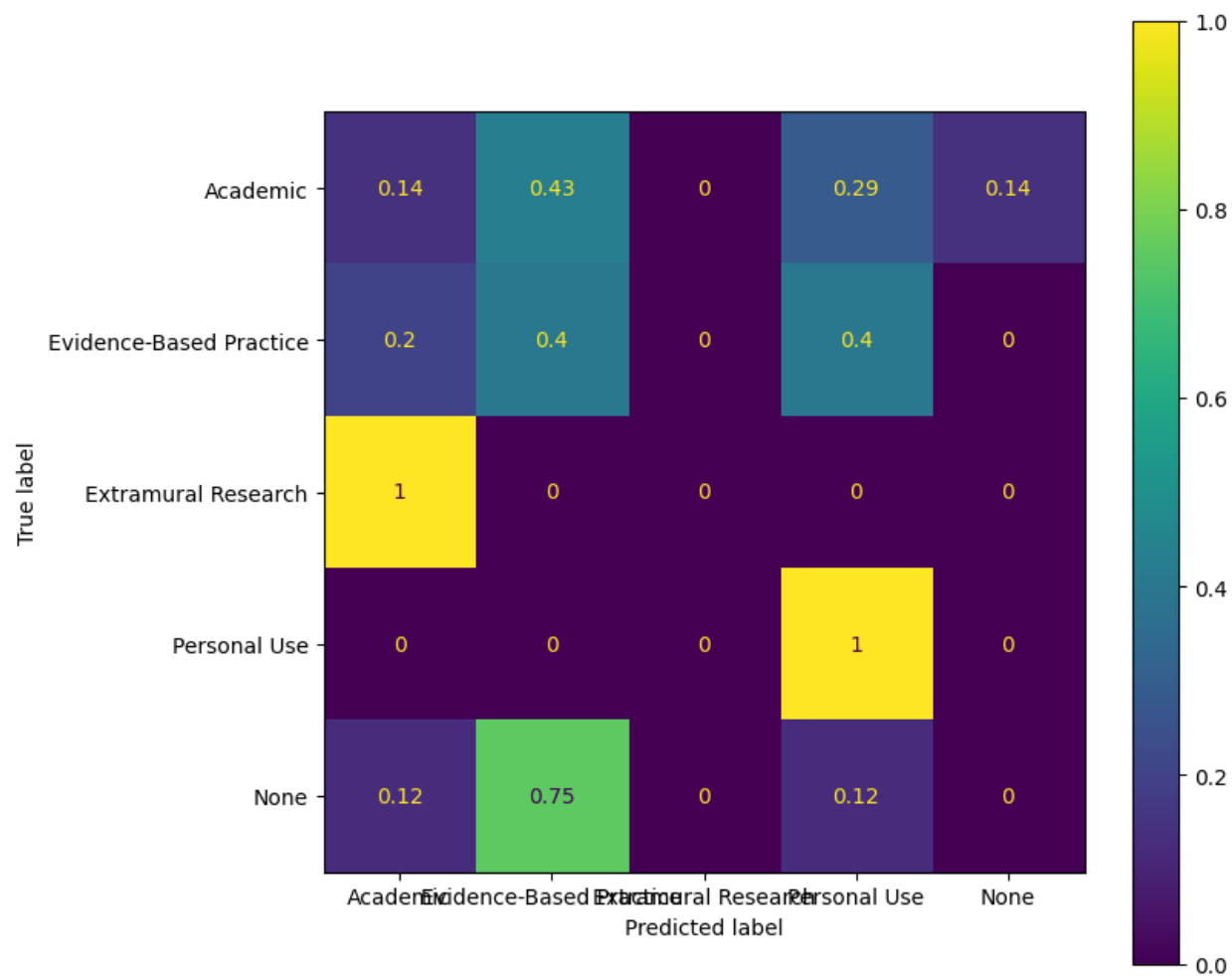
Epochs: 7 | Train Loss: 0.338 | Train Accuracy: 0.803 | Val Loss: 1.772 |  
Val Accuracy: 0.364

100% 87/87 [00:11<00:00, 7.34it/s]

Epochs: 8 | Train Loss: 0.364 | Train Accuracy: 0.763 | Val Loss: 1.806 |  
Val Accuracy: 0.136

**Test Accuracy: 0.182**

Confusion matrix:



## HICKS LARGE CATEGORIES

```
activation_function = 'relu'
batch_size = 32
learning_rate = 0.001
regularization = tf.keras.regularizers.l2(0.01)
Epochs = 20
Train size = 80%
Test size = 20%
```

Epoch 1/20

22/22 [=====] - 52s 915ms/step - loss: 1.4833 - accuracy: 0.3793 - balanced\_recall: 0.0330 - balanced\_precision: 0.1308 - balanced\_f1\_score: 0.0474 - val\_loss: 1.3515 - val\_accuracy: 0.4294 - val\_balanced\_recall: 0.0407 - val\_balanced\_precision: 0.1767 - val\_balanced\_f1\_score: 0.0615

Epoch 2/20

22/22 [=====] - 14s 658ms/step - loss: 1.2528 - accuracy: 0.4844 - balanced\_recall: 0.1034 - balanced\_precision: 0.3535 - balanced\_f1\_score: 0.1546 - val\_loss: 1.2100 - val\_accuracy: 0.5876 - val\_balanced\_recall: 0.0971 - val\_balanced\_precision: 0.3333 - val\_balanced\_f1\_score: 0.1483

Epoch 3/20

22/22 [=====] - 18s 827ms/step - loss: 1.1179 - accuracy: 0.5909 - balanced\_recall: 0.1885 - balanced\_precision: 0.5811 - balanced\_f1\_score: 0.2791 - val\_loss: 1.1174 - val\_accuracy: 0.5932 - val\_balanced\_recall: 0.1718 - val\_balanced\_precision: 0.4050 - val\_balanced\_f1\_score: 0.2411

Epoch 4/20

22/22 [=====] - 18s 860ms/step - loss: 1.0252 - accuracy: 0.6406 - balanced\_recall: 0.2962 - balanced\_precision: 0.5942 - balanced\_f1\_score: 0.3876 - val\_loss: 1.0542 - val\_accuracy: 0.5876 - val\_balanced\_recall: 0.2421 - val\_balanced\_precision: 0.5079 - val\_balanced\_f1\_score: 0.3242

Epoch 5/20

22/22 [=====] - 19s 879ms/step - loss: 0.9527 - accuracy: 0.6790 - balanced\_recall: 0.3218 - balanced\_precision: 0.6380 - balanced\_f1\_score: 0.4212 - val\_loss: 0.9989 - val\_accuracy: 0.6384 - val\_balanced\_recall: 0.3184 - val\_balanced\_precision: 0.6445 - val\_balanced\_f1\_score: 0.4230

Epoch 6/20

22/22 [=====] - 18s 841ms/step - loss: 0.9087 - accuracy: 0.6790 - balanced\_recall: 0.3772 - balanced\_precision: 0.6191 - balanced\_f1\_score: 0.4651 - val\_loss: 0.9512 - val\_accuracy: 0.6723 - val\_balanced\_recall: 0.3726 - val\_balanced\_precision: 0.6223 - val\_balanced\_f1\_score: 0.4603

Epoch 7/20



22/22 [=====] - 23s 1s/step - loss: 0.8542 - accuracy: 0.7301 -  
balanced\_recall: 0.4328 - balanced\_precision: 0.7006 - balanced\_f1\_score: 0.5332 - val\_loss:  
0.9230 - val\_accuracy: 0.6836 - val\_balanced\_recall: 0.3992 - val\_balanced\_precision: 0.6681 -  
val\_balanced\_f1\_score: 0.4956

Epoch 8/20

22/22 [=====] - 18s 836ms/step - loss: 0.8098 - accuracy:  
0.7500 - balanced\_recall: 0.4731 - balanced\_precision: 0.7106 - balanced\_f1\_score: 0.5653 -  
val\_loss: 0.9017 - val\_accuracy: 0.6893 - val\_balanced\_recall: 0.4078 - val\_balanced\_precision:  
0.6770 - val\_balanced\_f1\_score: 0.5020

Epoch 9/20

22/22 [=====] - 20s 949ms/step - loss: 0.7834 - accuracy:  
0.7401 - balanced\_recall: 0.5003 - balanced\_precision: 0.7433 - balanced\_f1\_score: 0.5959 -  
val\_loss: 0.8776 - val\_accuracy: 0.7006 - val\_balanced\_recall: 0.4304 - val\_balanced\_precision:  
0.7062 - val\_balanced\_f1\_score: 0.5307

Epoch 10/20

22/22 [=====] - 17s 767ms/step - loss: 0.7462 - accuracy:  
0.7585 - balanced\_recall: 0.5392 - balanced\_precision: 0.7379 - balanced\_f1\_score: 0.6208 -  
val\_loss: 0.8706 - val\_accuracy: 0.6667 - val\_balanced\_recall: 0.4647 - val\_balanced\_precision:  
0.7068 - val\_balanced\_f1\_score: 0.5587

Epoch 11/20

22/22 [=====] - 25s 1s/step - loss: 0.7301 - accuracy: 0.7557 -  
balanced\_recall: 0.5212 - balanced\_precision: 0.7461 - balanced\_f1\_score: 0.6099 - val\_loss:  
0.8546 - val\_accuracy: 0.6949 - val\_balanced\_recall: 0.4709 - val\_balanced\_precision: 0.6812 -  
val\_balanced\_f1\_score: 0.5559

Epoch 12/20

22/22 [=====] - 18s 856ms/step - loss: 0.7028 - accuracy:  
0.7798 - balanced\_recall: 0.5625 - balanced\_precision: 0.7854 - balanced\_f1\_score: 0.6530 -  
val\_loss: 0.8383 - val\_accuracy: 0.7062 - val\_balanced\_recall: 0.5056 - val\_balanced\_precision:  
0.6854 - val\_balanced\_f1\_score: 0.5804

Epoch 13/20

22/22 [=====] - 10s 467ms/step - loss: 0.6901 - accuracy:  
0.7656 - balanced\_recall: 0.5710 - balanced\_precision: 0.8152 - balanced\_f1\_score: 0.6695 -  
val\_loss: 0.8392 - val\_accuracy: 0.6949 - val\_balanced\_recall: 0.4994 - val\_balanced\_precision:  
0.6844 - val\_balanced\_f1\_score: 0.5767

Epoch 14/20

22/22 [=====] - 21s 1s/step - loss: 0.6573 - accuracy: 0.7812 -  
balanced\_recall: 0.6121 - balanced\_precision: 0.8385 - balanced\_f1\_score: 0.7046 - val\_loss:  
0.8146 - val\_accuracy: 0.7288 - val\_balanced\_recall: 0.5080 - val\_balanced\_precision: 0.6697 -  
val\_balanced\_f1\_score: 0.5755

Epoch 15/20

22/22 [=====] - 18s 819ms/step - loss: 0.6355 - accuracy:  
0.8026 - balanced\_recall: 0.6462 - balanced\_precision: 0.7968 - balanced\_f1\_score: 0.7109 -  
val\_loss: 0.8139 - val\_accuracy: 0.7119 - val\_balanced\_recall: 0.5147 - val\_balanced\_precision:  
0.6827 - val\_balanced\_f1\_score: 0.5845

Epoch 16/20

22/22 [=====] - 24s 1s/step - loss: 0.6346 - accuracy: 0.8026 - balanced\_recall: 0.6298 - balanced\_precision: 0.7935 - balanced\_f1\_score: 0.6999 - val\_loss: 0.8068 - val\_accuracy: 0.7345 - val\_balanced\_recall: 0.5307 - val\_balanced\_precision: 0.7054 - val\_balanced\_f1\_score: 0.6021

Epoch 17/20

22/22 [=====] - 19s 894ms/step - loss: 0.6372 - accuracy: 0.7855 - balanced\_recall: 0.6169 - balanced\_precision: 0.7876 - balanced\_f1\_score: 0.6900 - val\_loss: 0.7997 - val\_accuracy: 0.7232 - val\_balanced\_recall: 0.5308 - val\_balanced\_precision: 0.7078 - val\_balanced\_f1\_score: 0.6035

Epoch 18/20

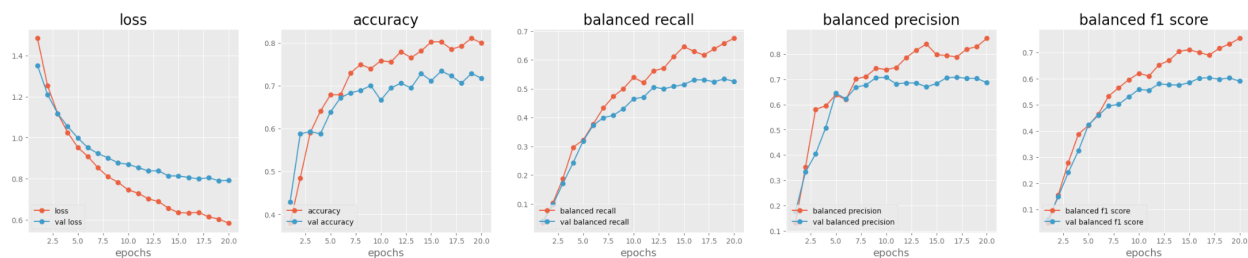
22/22 [=====] - 11s 497ms/step - loss: 0.6149 - accuracy: 0.7926 - balanced\_recall: 0.6385 - balanced\_precision: 0.8193 - balanced\_f1\_score: 0.7167 - val\_loss: 0.8048 - val\_accuracy: 0.7062 - val\_balanced\_recall: 0.5243 - val\_balanced\_precision: 0.7032 - val\_balanced\_f1\_score: 0.5979

Epoch 19/20

22/22 [=====] - 26s 1s/step - loss: 0.6040 - accuracy: 0.8111 - balanced\_recall: 0.6581 - balanced\_precision: 0.8286 - balanced\_f1\_score: 0.7325 - val\_loss: 0.7911 - val\_accuracy: 0.7288 - val\_balanced\_recall: 0.5340 - val\_balanced\_precision: 0.7025 - val\_balanced\_f1\_score: 0.6028

Epoch 20/20

22/22 [=====] - 10s 476ms/step - loss: 0.5846 - accuracy: 0.7997 - balanced\_recall: 0.6755 - balanced\_precision: 0.8618 - balanced\_f1\_score: 0.7547 - val\_loss: 0.7928 - val\_accuracy: 0.7175 - val\_balanced\_recall: 0.5256 - val\_balanced\_precision: 0.6865 - val\_balanced\_f1\_score: 0.5905



RUN #2

Epoch 1/20

22/22 [=====] - 60s 1s/step - loss: 1.4921 - accuracy: 0.3480 - balanced\_recall: 0.0438 - balanced\_precision: 0.1621 - balanced\_f1\_score: 0.0671 - val\_loss: 1.4380 - val\_accuracy: 0.4124 - val\_balanced\_recall: 0.0848 - val\_balanced\_precision: 0.3278 - val\_balanced\_f1\_score: 0.1329

Epoch 2/20

22/22 [=====] - 13s 601ms/step - loss: 1.2762 - accuracy: 0.4986 - balanced\_recall: 0.1056 - balanced\_precision: 0.3652 - balanced\_f1\_score: 0.1593 - val\_loss: 1.2694 - val\_accuracy: 0.5028 - val\_balanced\_recall: 0.1734 - val\_balanced\_precision: 0.5272 - val\_balanced\_f1\_score: 0.2601

Epoch 3/20

22/22 [=====] - 20s 923ms/step - loss: 1.1332 - accuracy: 0.5440 - balanced\_recall: 0.2107 - balanced\_precision: 0.5559 - balanced\_f1\_score: 0.3008 - val\_loss: 1.1610 - val\_accuracy: 0.5424 - val\_balanced\_recall: 0.2055 - val\_balanced\_precision: 0.5023 - val\_balanced\_f1\_score: 0.2892

Epoch 4/20

22/22 [=====] - 15s 710ms/step - loss: 1.0291 - accuracy: 0.5923 - balanced\_recall: 0.2680 - balanced\_precision: 0.5527 - balanced\_f1\_score: 0.3551 - val\_loss: 1.0984 - val\_accuracy: 0.5763 - val\_balanced\_recall: 0.3336 - val\_balanced\_precision: 0.6078 - val\_balanced\_f1\_score: 0.4286

Epoch 5/20

22/22 [=====] - 19s 866ms/step - loss: 0.9722 - accuracy: 0.6378 - balanced\_recall: 0.3316 - balanced\_precision: 0.5926 - balanced\_f1\_score: 0.4213 - val\_loss: 1.0375 - val\_accuracy: 0.5989 - val\_balanced\_recall: 0.3634 - val\_balanced\_precision: 0.6283 - val\_balanced\_f1\_score: 0.4568

Epoch 6/20

22/22 [=====] - 22s 1s/step - loss: 0.9103 - accuracy: 0.6648 - balanced\_recall: 0.4042 - balanced\_precision: 0.6357 - balanced\_f1\_score: 0.4886 - val\_loss: 0.9963 - val\_accuracy: 0.6102 - val\_balanced\_recall: 0.3904 - val\_balanced\_precision: 0.6344 - val\_balanced\_f1\_score: 0.4804

Epoch 7/20

22/22 [=====] - 22s 1s/step - loss: 0.8571 - accuracy: 0.7102 - balanced\_recall: 0.4289 - balanced\_precision: 0.6822 - balanced\_f1\_score: 0.5221 - val\_loss: 0.9659 - val\_accuracy: 0.6158 - val\_balanced\_recall: 0.4034 - val\_balanced\_precision: 0.6446 - val\_balanced\_f1\_score: 0.4924

Epoch 8/20

22/22 [=====] - 19s 878ms/step - loss: 0.8212 - accuracy: 0.7074 - balanced\_recall: 0.4560 - balanced\_precision: 0.6689 - balanced\_f1\_score: 0.5399 - val\_loss: 0.9285 - val\_accuracy: 0.6497 - val\_balanced\_recall: 0.4370 - val\_balanced\_precision: 0.6433 - val\_balanced\_f1\_score: 0.5170

Epoch 9/20

22/22 [=====] - 22s 1s/step - loss: 0.7849 - accuracy: 0.7244 - balanced\_recall: 0.5015 - balanced\_precision: 0.7503 - balanced\_f1\_score: 0.5961 - val\_loss: 0.9252 - val\_accuracy: 0.6328 - val\_balanced\_recall: 0.4712 - val\_balanced\_precision: 0.6362 - val\_balanced\_f1\_score: 0.5397

Epoch 10/20

22/22 [=====] - 22s 1s/step - loss: 0.7551 - accuracy: 0.7315 - balanced\_recall: 0.5118 - balanced\_precision: 0.7486 - balanced\_f1\_score: 0.6060 - val\_loss:

0.8926 - val\_accuracy: 0.6610 - val\_balanced\_recall: 0.4672 - val\_balanced\_precision: 0.6683 - val\_balanced\_f1\_score: 0.5466

Epoch 11/20

22/22 [=====] - 21s 991ms/step - loss: 0.7375 - accuracy: 0.7528 - balanced\_recall: 0.5368 - balanced\_precision: 0.7710 - balanced\_f1\_score: 0.6296 - val\_loss: 0.8823 - val\_accuracy: 0.6497 - val\_balanced\_recall: 0.4811 - val\_balanced\_precision: 0.6847 - val\_balanced\_f1\_score: 0.5632

Epoch 12/20

22/22 [=====] - 11s 489ms/step - loss: 0.7083 - accuracy: 0.7827 - balanced\_recall: 0.5611 - balanced\_precision: 0.7857 - balanced\_f1\_score: 0.6522 - val\_loss: 0.8847 - val\_accuracy: 0.6610 - val\_balanced\_recall: 0.4887 - val\_balanced\_precision: 0.6554 - val\_balanced\_f1\_score: 0.5572

Epoch 13/20

22/22 [=====] - 19s 891ms/step - loss: 0.6737 - accuracy: 0.7770 - balanced\_recall: 0.6063 - balanced\_precision: 0.8029 - balanced\_f1\_score: 0.6882 - val\_loss: 0.8676 - val\_accuracy: 0.6949 - val\_balanced\_recall: 0.5109 - val\_balanced\_precision: 0.6723 - val\_balanced\_f1\_score: 0.5784

Epoch 14/20

22/22 [=====] - 22s 1s/step - loss: 0.6729 - accuracy: 0.7812 - balanced\_recall: 0.5922 - balanced\_precision: 0.7696 - balanced\_f1\_score: 0.6678 - val\_loss: 0.8527 - val\_accuracy: 0.6836 - val\_balanced\_recall: 0.4959 - val\_balanced\_precision: 0.6978 - val\_balanced\_f1\_score: 0.5779

Epoch 15/20

22/22 [=====] - 11s 504ms/step - loss: 0.6418 - accuracy: 0.7983 - balanced\_recall: 0.6241 - balanced\_precision: 0.8222 - balanced\_f1\_score: 0.7080 - val\_loss: 0.8540 - val\_accuracy: 0.6780 - val\_balanced\_recall: 0.5158 - val\_balanced\_precision: 0.6796 - val\_balanced\_f1\_score: 0.5846

Epoch 16/20

22/22 [=====] - 21s 1s/step - loss: 0.6410 - accuracy: 0.7869 - balanced\_recall: 0.6088 - balanced\_precision: 0.7906 - balanced\_f1\_score: 0.6849 - val\_loss: 0.8522 - val\_accuracy: 0.6780 - val\_balanced\_recall: 0.5393 - val\_balanced\_precision: 0.7259 - val\_balanced\_f1\_score: 0.6161

Epoch 17/20

22/22 [=====] - 24s 1s/step - loss: 0.6166 - accuracy: 0.8068 - balanced\_recall: 0.6336 - balanced\_precision: 0.8371 - balanced\_f1\_score: 0.7202 - val\_loss: 0.8324 - val\_accuracy: 0.7006 - val\_balanced\_recall: 0.5394 - val\_balanced\_precision: 0.7580 - val\_balanced\_f1\_score: 0.6268

Epoch 18/20

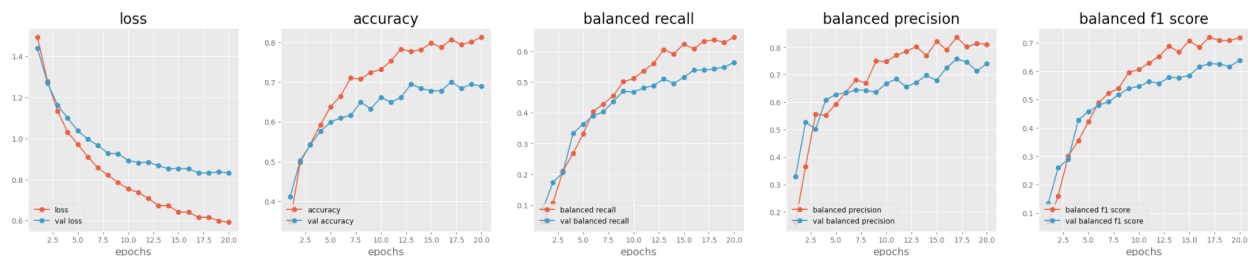
22/22 [=====] - 20s 909ms/step - loss: 0.6162 - accuracy: 0.7940 - balanced\_recall: 0.6378 - balanced\_precision: 0.8019 - balanced\_f1\_score: 0.7086 - val\_loss: 0.8319 - val\_accuracy: 0.6836 - val\_balanced\_recall: 0.5435 - val\_balanced\_precision: 0.7468 - val\_balanced\_f1\_score: 0.6254

Epoch 19/20

22/22 [=====] - 10s 473ms/step - loss: 0.5992 - accuracy: 0.8011 - balanced\_recall: 0.6298 - balanced\_precision: 0.8145 - balanced\_f1\_score: 0.7086 - val\_loss: 0.8376 - val\_accuracy: 0.6949 - val\_balanced\_recall: 0.5489 - val\_balanced\_precision: 0.7141 - val\_balanced\_f1\_score: 0.6165

Epoch 20/20

22/22 [=====] - 10s 480ms/step - loss: 0.5927 - accuracy: 0.8125 - balanced\_recall: 0.6465 - balanced\_precision: 0.8113 - balanced\_f1\_score: 0.7179 - val\_loss: 0.8326 - val\_accuracy: 0.6893 - val\_balanced\_recall: 0.5648 - val\_balanced\_precision: 0.7410 - val\_balanced\_f1\_score: 0.6392



RUN #3

Epoch 1/20

22/22 [=====] - 44s 902ms/step - loss: 1.5468 - accuracy: 0.3026 - balanced\_recall: 0.0259 - balanced\_precision: 0.1268 - balanced\_f1\_score: 0.0402 - val\_loss: 1.4394 - val\_accuracy: 0.3955 - val\_balanced\_recall: 0.0410 - val\_balanced\_precision: 0.1944 - val\_balanced\_f1\_score: 0.0664

Epoch 2/20

22/22 [=====] - 14s 652ms/step - loss: 1.2841 - accuracy: 0.4531 - balanced\_recall: 0.0738 - balanced\_precision: 0.3155 - balanced\_f1\_score: 0.1183 - val\_loss: 1.3054 - val\_accuracy: 0.4689 - val\_balanced\_recall: 0.0837 - val\_balanced\_precision: 0.2750 - val\_balanced\_f1\_score: 0.1278

Epoch 3/20

22/22 [=====] - 24s 1s/step - loss: 1.1311 - accuracy: 0.5497 - balanced\_recall: 0.1931 - balanced\_precision: 0.5122 - balanced\_f1\_score: 0.2771 - val\_loss: 1.2317 - val\_accuracy: 0.5198 - val\_balanced\_recall: 0.1767 - val\_balanced\_precision: 0.4636 - val\_balanced\_f1\_score: 0.2531

Epoch 4/20

22/22 [=====] - 14s 652ms/step - loss: 1.0332 - accuracy: 0.6009 - balanced\_recall: 0.2796 - balanced\_precision: 0.6203 - balanced\_f1\_score: 0.3821 - val\_loss: 1.1708 - val\_accuracy: 0.5537 - val\_balanced\_recall: 0.2251 - val\_balanced\_precision: 0.4901 - val\_balanced\_f1\_score: 0.3056

Epoch 5/20

22/22 [=====] - 24s 1s/step - loss: 0.9342 - accuracy: 0.6676 - balanced\_recall: 0.3556 - balanced\_precision: 0.6445 - balanced\_f1\_score: 0.4555 - val\_loss:

1.1355 - val\_accuracy: 0.5706 - val\_balanced\_recall: 0.2816 - val\_balanced\_precision: 0.5386 - val\_balanced\_f1\_score: 0.3671

Epoch 6/20

22/22 [=====] - 14s 655ms/step - loss: 0.8903 - accuracy: 0.6932 - balanced\_recall: 0.3872 - balanced\_precision: 0.6797 - balanced\_f1\_score: 0.4906 - val\_loss: 1.0858 - val\_accuracy: 0.5763 - val\_balanced\_recall: 0.2827 - val\_balanced\_precision: 0.5110 - val\_balanced\_f1\_score: 0.3615

Epoch 7/20

22/22 [=====] - 22s 1s/step - loss: 0.8351 - accuracy: 0.7173 - balanced\_recall: 0.4389 - balanced\_precision: 0.6754 - balanced\_f1\_score: 0.5282 - val\_loss: 1.0793 - val\_accuracy: 0.5706 - val\_balanced\_recall: 0.3472 - val\_balanced\_precision: 0.5919 - val\_balanced\_f1\_score: 0.4353

Epoch 8/20

22/22 [=====] - 12s 570ms/step - loss: 0.8018 - accuracy: 0.7131 - balanced\_recall: 0.4559 - balanced\_precision: 0.6920 - balanced\_f1\_score: 0.5466 - val\_loss: 1.0395 - val\_accuracy: 0.5989 - val\_balanced\_recall: 0.3587 - val\_balanced\_precision: 0.6324 - val\_balanced\_f1\_score: 0.4548

Epoch 9/20

22/22 [=====] - 17s 792ms/step - loss: 0.7703 - accuracy: 0.7358 - balanced\_recall: 0.4995 - balanced\_precision: 0.7504 - balanced\_f1\_score: 0.5952 - val\_loss: 1.0242 - val\_accuracy: 0.6045 - val\_balanced\_recall: 0.3893 - val\_balanced\_precision: 0.6131 - val\_balanced\_f1\_score: 0.4746

Epoch 10/20

22/22 [=====] - 16s 744ms/step - loss: 0.7301 - accuracy: 0.7358 - balanced\_recall: 0.5017 - balanced\_precision: 0.6896 - balanced\_f1\_score: 0.5782 - val\_loss: 0.9993 - val\_accuracy: 0.6328 - val\_balanced\_recall: 0.3905 - val\_balanced\_precision: 0.6071 - val\_balanced\_f1\_score: 0.4745

Epoch 11/20

22/22 [=====] - 23s 1s/step - loss: 0.7142 - accuracy: 0.7642 - balanced\_recall: 0.5406 - balanced\_precision: 0.7551 - balanced\_f1\_score: 0.6275 - val\_loss: 0.9845 - val\_accuracy: 0.6497 - val\_balanced\_recall: 0.4108 - val\_balanced\_precision: 0.6673 - val\_balanced\_f1\_score: 0.5034

Epoch 12/20

22/22 [=====] - 10s 432ms/step - loss: 0.6925 - accuracy: 0.7784 - balanced\_recall: 0.5453 - balanced\_precision: 0.7646 - balanced\_f1\_score: 0.6337 - val\_loss: 1.0000 - val\_accuracy: 0.6215 - val\_balanced\_recall: 0.4153 - val\_balanced\_precision: 0.5933 - val\_balanced\_f1\_score: 0.4884

Epoch 13/20

22/22 [=====] - 15s 695ms/step - loss: 0.6855 - accuracy: 0.7614 - balanced\_recall: 0.5820 - balanced\_precision: 0.7675 - balanced\_f1\_score: 0.6596 - val\_loss: 0.9704 - val\_accuracy: 0.6441 - val\_balanced\_recall: 0.4685 - val\_balanced\_precision: 0.6867 - val\_balanced\_f1\_score: 0.5533

Epoch 14/20

22/22 [=====] - 23s 1s/step - loss: 0.6562 - accuracy: 0.7869 -  
balanced\_recall: 0.5785 - balanced\_precision: 0.7656 - balanced\_f1\_score: 0.6566 - val\_loss:  
0.9563 - val\_accuracy: 0.6723 - val\_balanced\_recall: 0.4601 - val\_balanced\_precision: 0.6872 -  
val\_balanced\_f1\_score: 0.5477

Epoch 15/20

22/22 [=====] - 11s 486ms/step - loss: 0.6280 - accuracy:  
0.8026 - balanced\_recall: 0.6162 - balanced\_precision: 0.8114 - balanced\_f1\_score: 0.6980 -  
val\_loss: 0.9701 - val\_accuracy: 0.6271 - val\_balanced\_recall: 0.4478 - val\_balanced\_precision:  
0.6433 - val\_balanced\_f1\_score: 0.5268

Epoch 16/20

22/22 [=====] - 16s 745ms/step - loss: 0.6262 - accuracy:  
0.7955 - balanced\_recall: 0.6213 - balanced\_precision: 0.8063 - balanced\_f1\_score: 0.6985 -  
val\_loss: 0.9461 - val\_accuracy: 0.6610 - val\_balanced\_recall: 0.4889 - val\_balanced\_precision:  
0.6980 - val\_balanced\_f1\_score: 0.5726

Epoch 17/20

22/22 [=====] - 10s 469ms/step - loss: 0.6047 - accuracy:  
0.8182 - balanced\_recall: 0.6324 - balanced\_precision: 0.8462 - balanced\_f1\_score: 0.7217 -  
val\_loss: 0.9538 - val\_accuracy: 0.6667 - val\_balanced\_recall: 0.4798 - val\_balanced\_precision:  
0.6820 - val\_balanced\_f1\_score: 0.5619

Epoch 18/20

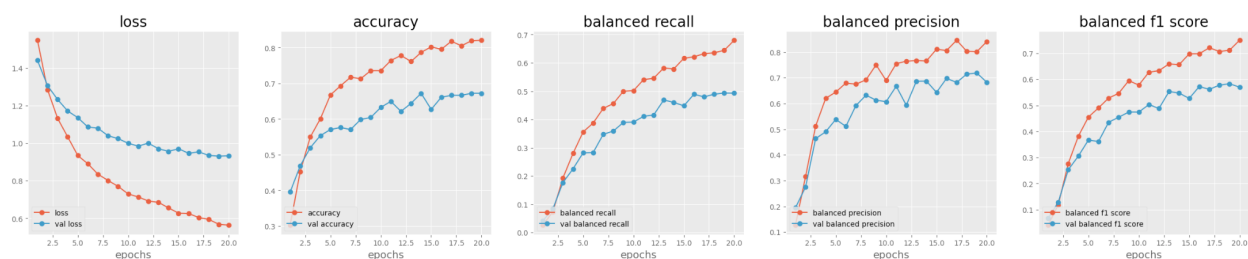
22/22 [=====] - 20s 947ms/step - loss: 0.5950 - accuracy:  
0.8054 - balanced\_recall: 0.6356 - balanced\_precision: 0.8032 - balanced\_f1\_score: 0.7071 -  
val\_loss: 0.9346 - val\_accuracy: 0.6667 - val\_balanced\_recall: 0.4889 - val\_balanced\_precision:  
0.7147 - val\_balanced\_f1\_score: 0.5779

Epoch 19/20

22/22 [=====] - 17s 815ms/step - loss: 0.5689 - accuracy:  
0.8196 - balanced\_recall: 0.6440 - balanced\_precision: 0.8016 - balanced\_f1\_score: 0.7119 -  
val\_loss: 0.9312 - val\_accuracy: 0.6723 - val\_balanced\_recall: 0.4931 - val\_balanced\_precision:  
0.7187 - val\_balanced\_f1\_score: 0.5835

Epoch 20/20

22/22 [=====] - 10s 475ms/step - loss: 0.5642 - accuracy:  
0.8210 - balanced\_recall: 0.6799 - balanced\_precision: 0.8415 - balanced\_f1\_score: 0.7504 -  
val\_loss: 0.9328 - val\_accuracy: 0.6723 - val\_balanced\_recall: 0.4926 - val\_balanced\_precision:  
0.6825 - val\_balanced\_f1\_score: 0.5702



RUN #4

Epoch 1/20

22/22 [=====] - 46s 859ms/step - loss: 1.5480 - accuracy: 0.3253 - balanced\_recall: 0.0296 - balanced\_precision: 0.1318 - balanced\_f1\_score: 0.0470 - val\_loss: 1.4588 - val\_accuracy: 0.3842 - val\_balanced\_recall: 0.0177 - val\_balanced\_precision: 0.0833 - val\_balanced\_f1\_score: 0.0279

Epoch 2/20

22/22 [=====] - 13s 583ms/step - loss: 1.3164 - accuracy: 0.4886 - balanced\_recall: 0.0622 - balanced\_precision: 0.2721 - balanced\_f1\_score: 0.0987 - val\_loss: 1.2879 - val\_accuracy: 0.5028 - val\_balanced\_recall: 0.0611 - val\_balanced\_precision: 0.2056 - val\_balanced\_f1\_score: 0.0917

Epoch 3/20

22/22 [=====] - 21s 985ms/step - loss: 1.1508 - accuracy: 0.5597 - balanced\_recall: 0.1506 - balanced\_precision: 0.5019 - balanced\_f1\_score: 0.2289 - val\_loss: 1.1781 - val\_accuracy: 0.5593 - val\_balanced\_recall: 0.1939 - val\_balanced\_precision: 0.3821 - val\_balanced\_f1\_score: 0.2536

Epoch 4/20

22/22 [=====] - 18s 844ms/step - loss: 1.0474 - accuracy: 0.6122 - balanced\_recall: 0.2519 - balanced\_precision: 0.5845 - balanced\_f1\_score: 0.3488 - val\_loss: 1.0907 - val\_accuracy: 0.5932 - val\_balanced\_recall: 0.2722 - val\_balanced\_precision: 0.5071 - val\_balanced\_f1\_score: 0.3495

Epoch 5/20

22/22 [=====] - 23s 1s/step - loss: 0.9592 - accuracy: 0.6562 - balanced\_recall: 0.3138 - balanced\_precision: 0.6551 - balanced\_f1\_score: 0.4197 - val\_loss: 1.0345 - val\_accuracy: 0.5989 - val\_balanced\_recall: 0.3280 - val\_balanced\_precision: 0.5135 - val\_balanced\_f1\_score: 0.3945

Epoch 6/20

22/22 [=====] - 15s 710ms/step - loss: 0.9028 - accuracy: 0.6960 - balanced\_recall: 0.3832 - balanced\_precision: 0.6887 - balanced\_f1\_score: 0.4903 - val\_loss: 0.9934 - val\_accuracy: 0.6045 - val\_balanced\_recall: 0.3771 - val\_balanced\_precision: 0.5488 - val\_balanced\_f1\_score: 0.4450

Epoch 7/20

22/22 [=====] - 19s 889ms/step - loss: 0.8632 - accuracy: 0.7244 - balanced\_recall: 0.4067 - balanced\_precision: 0.7115 - balanced\_f1\_score: 0.5149 - val\_loss: 0.9652 - val\_accuracy: 0.6158 - val\_balanced\_recall: 0.4065 - val\_balanced\_precision: 0.5376 - val\_balanced\_f1\_score: 0.4603

Epoch 8/20

22/22 [=====] - 16s 752ms/step - loss: 0.8201 - accuracy: 0.7131 - balanced\_recall: 0.4472 - balanced\_precision: 0.7142 - balanced\_f1\_score: 0.5459 - val\_loss: 0.9415 - val\_accuracy: 0.6158 - val\_balanced\_recall: 0.4067 - val\_balanced\_precision: 0.5945 - val\_balanced\_f1\_score: 0.4775

Epoch 9/20

22/22 [=====] - 20s 928ms/step - loss: 0.7854 - accuracy: 0.7386 - balanced\_recall: 0.4832 - balanced\_precision: 0.7306 - balanced\_f1\_score: 0.5799 -



val\_loss: 0.9058 - val\_accuracy: 0.6441 - val\_balanced\_recall: 0.4460 - val\_balanced\_precision: 0.6521 - val\_balanced\_f1\_score: 0.5271

Epoch 10/20

22/22 [=====] - 19s 901ms/step - loss: 0.7430 - accuracy: 0.7770 - balanced\_recall: 0.5156 - balanced\_precision: 0.7656 - balanced\_f1\_score: 0.6143 - val\_loss: 0.8938 - val\_accuracy: 0.6723 - val\_balanced\_recall: 0.4863 - val\_balanced\_precision: 0.7046 - val\_balanced\_f1\_score: 0.5721

Epoch 11/20

22/22 [=====] - 21s 989ms/step - loss: 0.7314 - accuracy: 0.7699 - balanced\_recall: 0.5236 - balanced\_precision: 0.7572 - balanced\_f1\_score: 0.6145 - val\_loss: 0.8662 - val\_accuracy: 0.6836 - val\_balanced\_recall: 0.4911 - val\_balanced\_precision: 0.6816 - val\_balanced\_f1\_score: 0.5666

Epoch 12/20

22/22 [=====] - 9s 400ms/step - loss: 0.7044 - accuracy: 0.7756 - balanced\_recall: 0.5514 - balanced\_precision: 0.7979 - balanced\_f1\_score: 0.6494 - val\_loss: 0.8681 - val\_accuracy: 0.6667 - val\_balanced\_recall: 0.4794 - val\_balanced\_precision: 0.6683 - val\_balanced\_f1\_score: 0.5569

Epoch 13/20

22/22 [=====] - 19s 879ms/step - loss: 0.7058 - accuracy: 0.7656 - balanced\_recall: 0.5572 - balanced\_precision: 0.7908 - balanced\_f1\_score: 0.6511 - val\_loss: 0.8424 - val\_accuracy: 0.6723 - val\_balanced\_recall: 0.5151 - val\_balanced\_precision: 0.7145 - val\_balanced\_f1\_score: 0.5955

Epoch 14/20

22/22 [=====] - 23s 1s/step - loss: 0.6752 - accuracy: 0.7812 - balanced\_recall: 0.5887 - balanced\_precision: 0.8358 - balanced\_f1\_score: 0.6879 - val\_loss: 0.8378 - val\_accuracy: 0.6780 - val\_balanced\_recall: 0.5253 - val\_balanced\_precision: 0.6969 - val\_balanced\_f1\_score: 0.5943

Epoch 15/20

22/22 [=====] - 17s 768ms/step - loss: 0.6500 - accuracy: 0.7812 - balanced\_recall: 0.5999 - balanced\_precision: 0.8134 - balanced\_f1\_score: 0.6866 - val\_loss: 0.8286 - val\_accuracy: 0.6949 - val\_balanced\_recall: 0.5379 - val\_balanced\_precision: 0.7023 - val\_balanced\_f1\_score: 0.6059

Epoch 16/20

22/22 [=====] - 23s 1s/step - loss: 0.6476 - accuracy: 0.7983 - balanced\_recall: 0.6076 - balanced\_precision: 0.8138 - balanced\_f1\_score: 0.6926 - val\_loss: 0.8232 - val\_accuracy: 0.6780 - val\_balanced\_recall: 0.5426 - val\_balanced\_precision: 0.6945 - val\_balanced\_f1\_score: 0.6040

Epoch 17/20

22/22 [=====] - 21s 957ms/step - loss: 0.6165 - accuracy: 0.8097 - balanced\_recall: 0.6634 - balanced\_precision: 0.8661 - balanced\_f1\_score: 0.7491 - val\_loss: 0.8115 - val\_accuracy: 0.6667 - val\_balanced\_recall: 0.5304 - val\_balanced\_precision: 0.7091 - val\_balanced\_f1\_score: 0.6032

Epoch 18/20

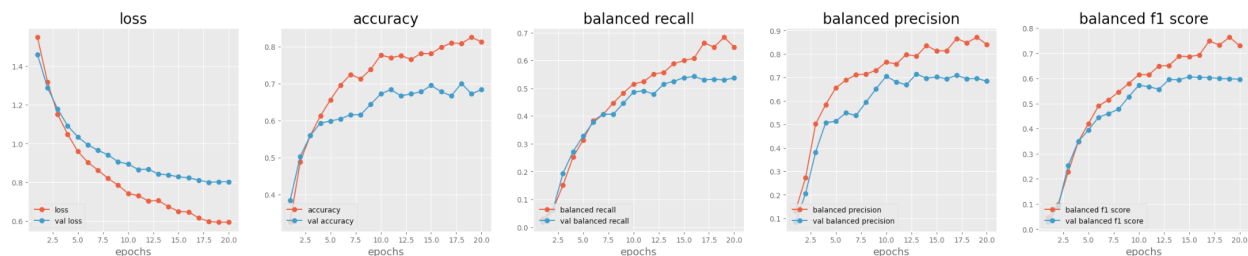
22/22 [=====] - 22s 1s/step - loss: 0.5980 - accuracy: 0.8082 - balanced\_recall: 0.6486 - balanced\_precision: 0.8474 - balanced\_f1\_score: 0.7323 - val\_loss: 0.7999 - val\_accuracy: 0.7006 - val\_balanced\_recall: 0.5326 - val\_balanced\_precision: 0.6947 - val\_balanced\_f1\_score: 0.5992

Epoch 19/20

22/22 [=====] - 10s 446ms/step - loss: 0.5946 - accuracy: 0.8253 - balanced\_recall: 0.6839 - balanced\_precision: 0.8713 - balanced\_f1\_score: 0.7635 - val\_loss: 0.8021 - val\_accuracy: 0.6723 - val\_balanced\_recall: 0.5300 - val\_balanced\_precision: 0.6956 - val\_balanced\_f1\_score: 0.5977

Epoch 20/20

22/22 [=====] - 10s 453ms/step - loss: 0.5951 - accuracy: 0.8125 - balanced\_recall: 0.6483 - balanced\_precision: 0.8405 - balanced\_f1\_score: 0.7300 - val\_loss: 0.8035 - val\_accuracy: 0.6836 - val\_balanced\_recall: 0.5373 - val\_balanced\_precision: 0.6843 - val\_balanced\_f1\_score: 0.5969



RUN #5

Epoch 1/20

22/22 [=====] - 49s 873ms/step - loss: 1.5518 - accuracy: 0.3011 - balanced\_recall: 0.0417 - balanced\_precision: 0.1374 - balanced\_f1\_score: 0.0614 - val\_loss: 1.3716 - val\_accuracy: 0.4350 - val\_balanced\_recall: 0.0331 - val\_balanced\_precision: 0.1444 - val\_balanced\_f1\_score: 0.0537

Epoch 2/20

22/22 [=====] - 15s 685ms/step - loss: 1.2832 - accuracy: 0.5000 - balanced\_recall: 0.0998 - balanced\_precision: 0.3392 - balanced\_f1\_score: 0.1513 - val\_loss: 1.1945 - val\_accuracy: 0.5763 - val\_balanced\_recall: 0.0732 - val\_balanced\_precision: 0.3833 - val\_balanced\_f1\_score: 0.1226

Epoch 3/20

22/22 [=====] - 17s 774ms/step - loss: 1.1553 - accuracy: 0.5554 - balanced\_recall: 0.2098 - balanced\_precision: 0.5506 - balanced\_f1\_score: 0.2929 - val\_loss: 1.1376 - val\_accuracy: 0.5480 - val\_balanced\_recall: 0.2295 - val\_balanced\_precision: 0.4913 - val\_balanced\_f1\_score: 0.3093

Epoch 4/20

22/22 [=====] - 17s 771ms/step - loss: 1.0508 - accuracy: 0.6122 - balanced\_recall: 0.2628 - balanced\_precision: 0.5913 - balanced\_f1\_score: 0.3586 -

val\_loss: 1.0556 - val\_accuracy: 0.5932 - val\_balanced\_recall: 0.2610 - val\_balanced\_precision:  
0.6091 - val\_balanced\_f1\_score: 0.3621

Epoch 5/20

22/22 [=====] - 14s 652ms/step - loss: 0.9720 - accuracy:  
0.6477 - balanced\_recall: 0.3100 - balanced\_precision: 0.6097 - balanced\_f1\_score: 0.4075 -  
val\_loss: 0.9917 - val\_accuracy: 0.6328 - val\_balanced\_recall: 0.3090 - val\_balanced\_precision:  
0.6691 - val\_balanced\_f1\_score: 0.4221

Epoch 6/20

22/22 [=====] - 15s 656ms/step - loss: 0.9252 - accuracy:  
0.6747 - balanced\_recall: 0.3572 - balanced\_precision: 0.6191 - balanced\_f1\_score: 0.4491 -  
val\_loss: 0.9799 - val\_accuracy: 0.6215 - val\_balanced\_recall: 0.3421 - val\_balanced\_precision:  
0.6579 - val\_balanced\_f1\_score: 0.4480

Epoch 7/20

22/22 [=====] - 13s 582ms/step - loss: 0.8624 - accuracy:  
0.6974 - balanced\_recall: 0.4054 - balanced\_precision: 0.6362 - balanced\_f1\_score: 0.4935 -  
val\_loss: 0.9360 - val\_accuracy: 0.6215 - val\_balanced\_recall: 0.3692 - val\_balanced\_precision:  
0.6487 - val\_balanced\_f1\_score: 0.4683

Epoch 8/20

22/22 [=====] - 10s 450ms/step - loss: 0.8071 - accuracy:  
0.7358 - balanced\_recall: 0.4570 - balanced\_precision: 0.7156 - balanced\_f1\_score: 0.5553 -  
val\_loss: 0.9364 - val\_accuracy: 0.6271 - val\_balanced\_recall: 0.3898 - val\_balanced\_precision:  
0.6354 - val\_balanced\_f1\_score: 0.4809

Epoch 9/20

22/22 [=====] - 15s 719ms/step - loss: 0.7906 - accuracy:  
0.7401 - balanced\_recall: 0.4498 - balanced\_precision: 0.6501 - balanced\_f1\_score: 0.5299 -  
val\_loss: 0.8805 - val\_accuracy: 0.6780 - val\_balanced\_recall: 0.4155 - val\_balanced\_precision:  
0.6623 - val\_balanced\_f1\_score: 0.5080

Epoch 10/20

22/22 [=====] - 14s 632ms/step - loss: 0.7672 - accuracy:  
0.7472 - balanced\_recall: 0.4905 - balanced\_precision: 0.7176 - balanced\_f1\_score: 0.5802 -  
val\_loss: 0.8632 - val\_accuracy: 0.6836 - val\_balanced\_recall: 0.4215 - val\_balanced\_precision:  
0.6555 - val\_balanced\_f1\_score: 0.5114

Epoch 11/20

22/22 [=====] - 12s 529ms/step - loss: 0.7214 - accuracy:  
0.7741 - balanced\_recall: 0.5377 - balanced\_precision: 0.7715 - balanced\_f1\_score: 0.6314 -  
val\_loss: 0.8633 - val\_accuracy: 0.6610 - val\_balanced\_recall: 0.4411 - val\_balanced\_precision:  
0.6955 - val\_balanced\_f1\_score: 0.5377

Epoch 12/20

22/22 [=====] - 14s 662ms/step - loss: 0.7168 - accuracy:  
0.7756 - balanced\_recall: 0.5464 - balanced\_precision: 0.7321 - balanced\_f1\_score: 0.6230 -  
val\_loss: 0.8479 - val\_accuracy: 0.6667 - val\_balanced\_recall: 0.4445 - val\_balanced\_precision:  
0.6309 - val\_balanced\_f1\_score: 0.5206

Epoch 13/20

22/22 [=====] - 13s 577ms/step - loss: 0.7090 - accuracy: 0.7656 - balanced\_recall: 0.5400 - balanced\_precision: 0.7725 - balanced\_f1\_score: 0.6330 - val\_loss: 0.8286 - val\_accuracy: 0.6949 - val\_balanced\_recall: 0.4522 - val\_balanced\_precision: 0.6500 - val\_balanced\_f1\_score: 0.5314

Epoch 14/20

22/22 [=====] - 14s 639ms/step - loss: 0.6859 - accuracy: 0.7812 - balanced\_recall: 0.5837 - balanced\_precision: 0.8183 - balanced\_f1\_score: 0.6790 - val\_loss: 0.8211 - val\_accuracy: 0.7119 - val\_balanced\_recall: 0.4698 - val\_balanced\_precision: 0.6773 - val\_balanced\_f1\_score: 0.5520

Epoch 15/20

22/22 [=====] - 15s 693ms/step - loss: 0.6701 - accuracy: 0.7713 - balanced\_recall: 0.5814 - balanced\_precision: 0.7794 - balanced\_f1\_score: 0.6643 - val\_loss: 0.8072 - val\_accuracy: 0.6893 - val\_balanced\_recall: 0.4765 - val\_balanced\_precision: 0.6783 - val\_balanced\_f1\_score: 0.5578

Epoch 16/20

22/22 [=====] - 12s 559ms/step - loss: 0.6425 - accuracy: 0.7997 - balanced\_recall: 0.6204 - balanced\_precision: 0.8165 - balanced\_f1\_score: 0.7017 - val\_loss: 0.8214 - val\_accuracy: 0.6893 - val\_balanced\_recall: 0.4796 - val\_balanced\_precision: 0.6637 - val\_balanced\_f1\_score: 0.5529

Epoch 17/20

22/22 [=====] - 9s 409ms/step - loss: 0.6224 - accuracy: 0.8011 - balanced\_recall: 0.6267 - balanced\_precision: 0.8126 - balanced\_f1\_score: 0.7066 - val\_loss: 0.8123 - val\_accuracy: 0.6893 - val\_balanced\_recall: 0.4755 - val\_balanced\_precision: 0.6476 - val\_balanced\_f1\_score: 0.5465

Epoch 18/20

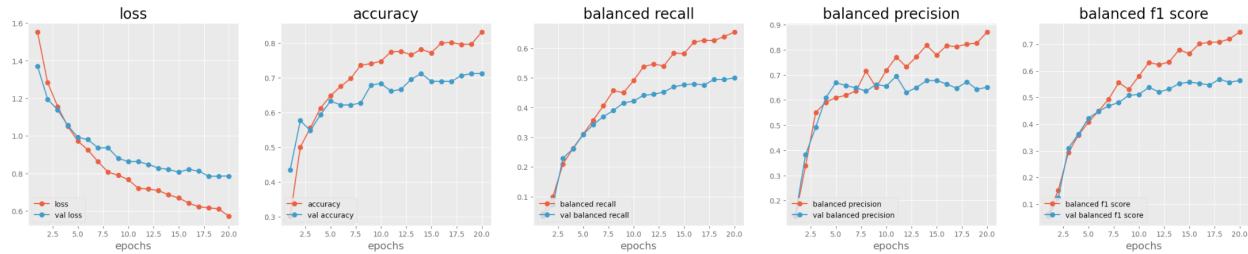
22/22 [=====] - 13s 615ms/step - loss: 0.6173 - accuracy: 0.7955 - balanced\_recall: 0.6257 - balanced\_precision: 0.8227 - balanced\_f1\_score: 0.7082 - val\_loss: 0.7851 - val\_accuracy: 0.7062 - val\_balanced\_recall: 0.4949 - val\_balanced\_precision: 0.6727 - val\_balanced\_f1\_score: 0.5683

Epoch 19/20

22/22 [=====] - 12s 537ms/step - loss: 0.6110 - accuracy: 0.7969 - balanced\_recall: 0.6390 - balanced\_precision: 0.8267 - balanced\_f1\_score: 0.7197 - val\_loss: 0.7851 - val\_accuracy: 0.7119 - val\_balanced\_recall: 0.4947 - val\_balanced\_precision: 0.6430 - val\_balanced\_f1\_score: 0.5565

Epoch 20/20

22/22 [=====] - 9s 401ms/step - loss: 0.5718 - accuracy: 0.8310 - balanced\_recall: 0.6541 - balanced\_precision: 0.8705 - balanced\_f1\_score: 0.7452 - val\_loss: 0.7865 - val\_accuracy: 0.7119 - val\_balanced\_recall: 0.4993 - val\_balanced\_precision: 0.6507 - val\_balanced\_f1\_score: 0.5637



## ELSABRY LARGE CATEGORY

```
activation_function = 'relu'
batch_size = 32
learning_rate = 0.001
regularization = tf.keras.regularizers.l2(0.01)
Epochs = 20
Test size = 20%
```

### RUN #1

#### Epoch 1/20

39/39 [=====] - 61s 711ms/step - loss: 1.0974 - accuracy: 0.4251 - balanced\_recall: 0.1965 - balanced\_precision: 0.3286 - balanced\_f1\_score: 0.2369 - val\_loss: 0.9283 - val\_accuracy: 0.5584 - val\_balanced\_recall: 0.2546 - val\_balanced\_precision: 0.5040 - val\_balanced\_f1\_score: 0.3359

#### Epoch 2/20

39/39 [=====] - 22s 565ms/step - loss: 0.8996 - accuracy: 0.5928 - balanced\_recall: 0.3437 - balanced\_precision: 0.5467 - balanced\_f1\_score: 0.4166 - val\_loss: 0.8260 - val\_accuracy: 0.6818 - val\_balanced\_recall: 0.3703 - val\_balanced\_precision: 0.5528 - val\_balanced\_f1\_score: 0.4370

#### Epoch 3/20

39/39 [=====] - 31s 812ms/step - loss: 0.8016 - accuracy: 0.6694 - balanced\_recall: 0.4332 - balanced\_precision: 0.6626 - balanced\_f1\_score: 0.5173 - val\_loss: 0.7733 - val\_accuracy: 0.7143 - val\_balanced\_recall: 0.4154 - val\_balanced\_precision: 0.6986 - val\_balanced\_f1\_score: 0.5107

#### Epoch 4/20

39/39 [=====] - 28s 717ms/step - loss: 0.7425 - accuracy: 0.7044 - balanced\_recall: 0.4800 - balanced\_precision: 0.6930 - balanced\_f1\_score: 0.5607 - val\_loss: 0.7497 - val\_accuracy: 0.7078 - val\_balanced\_recall: 0.4648 - val\_balanced\_precision: 0.7667 - val\_balanced\_f1\_score: 0.5735

Epoch 5/20

39/39 [=====] - 31s 809ms/step - loss: 0.7073 - accuracy: 0.7109 - balanced\_recall: 0.5195 - balanced\_precision: 0.7198 - balanced\_f1\_score: 0.5993 - val\_loss: 0.7135 - val\_accuracy: 0.7500 - val\_balanced\_recall: 0.5047 - val\_balanced\_precision: 0.7592 - val\_balanced\_f1\_score: 0.5998

Epoch 6/20

39/39 [=====] - 24s 625ms/step - loss: 0.6786 - accuracy: 0.7321 - balanced\_recall: 0.5575 - balanced\_precision: 0.7698 - balanced\_f1\_score: 0.6427 - val\_loss: 0.6938 - val\_accuracy: 0.7630 - val\_balanced\_recall: 0.5339 - val\_balanced\_precision: 0.7621 - val\_balanced\_f1\_score: 0.6216

Epoch 7/20

39/39 [=====] - 31s 799ms/step - loss: 0.6431 - accuracy: 0.7606 - balanced\_recall: 0.5874 - balanced\_precision: 0.7691 - balanced\_f1\_score: 0.6629 - val\_loss: 0.6779 - val\_accuracy: 0.7597 - val\_balanced\_recall: 0.5607 - val\_balanced\_precision: 0.7815 - val\_balanced\_f1\_score: 0.6451

Epoch 8/20

39/39 [=====] - 25s 641ms/step - loss: 0.6216 - accuracy: 0.7598 - balanced\_recall: 0.5852 - balanced\_precision: 0.7580 - balanced\_f1\_score: 0.6580 - val\_loss: 0.6672 - val\_accuracy: 0.7597 - val\_balanced\_recall: 0.5669 - val\_balanced\_precision: 0.7768 - val\_balanced\_f1\_score: 0.6476

Epoch 9/20

39/39 [=====] - 32s 823ms/step - loss: 0.6044 - accuracy: 0.7581 - balanced\_recall: 0.6222 - balanced\_precision: 0.8211 - balanced\_f1\_score: 0.7054 - val\_loss: 0.6599 - val\_accuracy: 0.7630 - val\_balanced\_recall: 0.5659 - val\_balanced\_precision: 0.7893 - val\_balanced\_f1\_score: 0.6500

Epoch 10/20

39/39 [=====] - 26s 675ms/step - loss: 0.6004 - accuracy: 0.7590 - balanced\_recall: 0.6181 - balanced\_precision: 0.8050 - balanced\_f1\_score: 0.6968 - val\_loss: 0.6475 - val\_accuracy: 0.7597 - val\_balanced\_recall: 0.5756 - val\_balanced\_precision: 0.7569 - val\_balanced\_f1\_score: 0.6465

Epoch 11/20

39/39 [=====] - 33s 865ms/step - loss: 0.5844 - accuracy: 0.7720 - balanced\_recall: 0.6450 - balanced\_precision: 0.8061 - balanced\_f1\_score: 0.7145 - val\_loss: 0.6408 - val\_accuracy: 0.7597 - val\_balanced\_recall: 0.5900 - val\_balanced\_precision: 0.7860 - val\_balanced\_f1\_score: 0.6664

Epoch 12/20

39/39 [=====] - 28s 733ms/step - loss: 0.5722 - accuracy: 0.7744 - balanced\_recall: 0.6596 - balanced\_precision: 0.8229 - balanced\_f1\_score: 0.7302 - val\_loss: 0.6387 - val\_accuracy: 0.7825 - val\_balanced\_recall: 0.5866 - val\_balanced\_precision: 0.8006 - val\_balanced\_f1\_score: 0.6703

Epoch 13/20

39/39 [=====] - 33s 846ms/step - loss: 0.5787 - accuracy: 0.7728 - balanced\_recall: 0.6335 - balanced\_precision: 0.7903 - balanced\_f1\_score: 0.7013 -

val\_loss: 0.6305 - val\_accuracy: 0.7792 - val\_balanced\_recall: 0.5941 - val\_balanced\_precision:  
0.8031 - val\_balanced\_f1\_score: 0.6758

Epoch 14/20

39/39 [=====] - 26s 666ms/step - loss: 0.5627 - accuracy:  
0.7891 - balanced\_recall: 0.6696 - balanced\_precision: 0.8203 - balanced\_f1\_score: 0.7351 -  
val\_loss: 0.6300 - val\_accuracy: 0.7825 - val\_balanced\_recall: 0.6110 - val\_balanced\_precision:  
0.8165 - val\_balanced\_f1\_score: 0.6936

Epoch 15/20

39/39 [=====] - 19s 501ms/step - loss: 0.5507 - accuracy:  
0.7932 - balanced\_recall: 0.7007 - balanced\_precision: 0.8384 - balanced\_f1\_score: 0.7599 -  
val\_loss: 0.6351 - val\_accuracy: 0.7435 - val\_balanced\_recall: 0.6455 - val\_balanced\_precision:  
0.7789 - val\_balanced\_f1\_score: 0.7035

Epoch 16/20

39/39 [=====] - 33s 860ms/step - loss: 0.5449 - accuracy:  
0.7883 - balanced\_recall: 0.6836 - balanced\_precision: 0.8327 - balanced\_f1\_score: 0.7490 -  
val\_loss: 0.6188 - val\_accuracy: 0.7890 - val\_balanced\_recall: 0.6153 - val\_balanced\_precision:  
0.8096 - val\_balanced\_f1\_score: 0.6941

Epoch 17/20

39/39 [=====] - 23s 597ms/step - loss: 0.5481 - accuracy:  
0.7842 - balanced\_recall: 0.6943 - balanced\_precision: 0.8114 - balanced\_f1\_score: 0.7465 -  
val\_loss: 0.6165 - val\_accuracy: 0.7825 - val\_balanced\_recall: 0.6236 - val\_balanced\_precision:  
0.8014 - val\_balanced\_f1\_score: 0.6967

Epoch 18/20

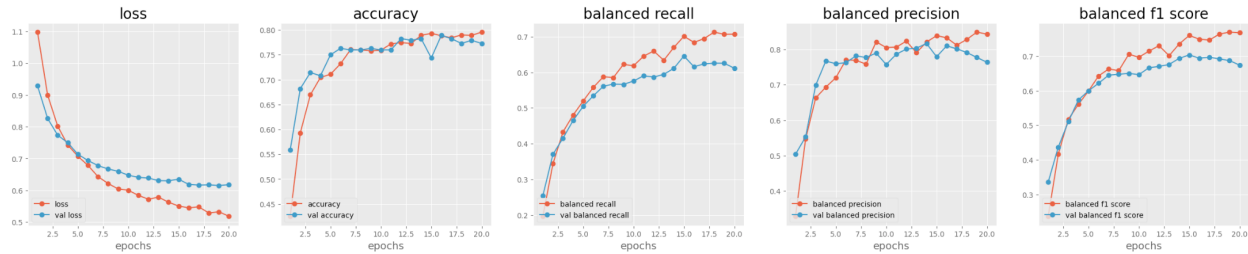
39/39 [=====] - 20s 514ms/step - loss: 0.5289 - accuracy:  
0.7899 - balanced\_recall: 0.7124 - balanced\_precision: 0.8280 - balanced\_f1\_score: 0.7639 -  
val\_loss: 0.6173 - val\_accuracy: 0.7727 - val\_balanced\_recall: 0.6254 - val\_balanced\_precision:  
0.7908 - val\_balanced\_f1\_score: 0.6919

Epoch 19/20

39/39 [=====] - 31s 810ms/step - loss: 0.5327 - accuracy:  
0.7891 - balanced\_recall: 0.7063 - balanced\_precision: 0.8485 - balanced\_f1\_score: 0.7694 -  
val\_loss: 0.6152 - val\_accuracy: 0.7792 - val\_balanced\_recall: 0.6253 - val\_balanced\_precision:  
0.7769 - val\_balanced\_f1\_score: 0.6871

Epoch 20/20

39/39 [=====] - 17s 445ms/step - loss: 0.5184 - accuracy:  
0.7956 - balanced\_recall: 0.7068 - balanced\_precision: 0.8428 - balanced\_f1\_score: 0.7675 -  
val\_loss: 0.6178 - val\_accuracy: 0.7727 - val\_balanced\_recall: 0.6113 - val\_balanced\_precision:  
0.7634 - val\_balanced\_f1\_score: 0.6740



## RUN #2

### Epoch 1/20

39/39 [=====] - 62s 1s/step - loss: 1.0315 - accuracy: 0.4919 - balanced\_recall: 0.2477 - balanced\_precision: 0.4219 - balanced\_f1\_score: 0.3062 - val\_loss: 0.9622 - val\_accuracy: 0.5357 - val\_balanced\_recall: 0.2404 - val\_balanced\_precision: 0.4758 - val\_balanced\_f1\_score: 0.3113

### Epoch 2/20

39/39 [=====] - 33s 860ms/step - loss: 0.8461 - accuracy: 0.6311 - balanced\_recall: 0.3665 - balanced\_precision: 0.5768 - balanced\_f1\_score: 0.4426 - val\_loss: 0.8784 - val\_accuracy: 0.6266 - val\_balanced\_recall: 0.3154 - val\_balanced\_precision: 0.4754 - val\_balanced\_f1\_score: 0.3758

### Epoch 3/20

39/39 [=====] - 35s 912ms/step - loss: 0.7763 - accuracy: 0.6914 - balanced\_recall: 0.4375 - balanced\_precision: 0.7149 - balanced\_f1\_score: 0.5370 - val\_loss: 0.8354 - val\_accuracy: 0.6623 - val\_balanced\_recall: 0.4203 - val\_balanced\_precision: 0.4810 - val\_balanced\_f1\_score: 0.4469

### Epoch 4/20

39/39 [=====] - 22s 574ms/step - loss: 0.7141 - accuracy: 0.7207 - balanced\_recall: 0.5026 - balanced\_precision: 0.7169 - balanced\_f1\_score: 0.5840 - val\_loss: 0.7967 - val\_accuracy: 0.6818 - val\_balanced\_recall: 0.4608 - val\_balanced\_precision: 0.5955 - val\_balanced\_f1\_score: 0.5091

### Epoch 5/20

39/39 [=====] - 27s 694ms/step - loss: 0.6823 - accuracy: 0.7378 - balanced\_recall: 0.5456 - balanced\_precision: 0.7496 - balanced\_f1\_score: 0.6269 - val\_loss: 0.7794 - val\_accuracy: 0.6883 - val\_balanced\_recall: 0.4911 - val\_balanced\_precision: 0.5864 - val\_balanced\_f1\_score: 0.5265

### Epoch 6/20

39/39 [=====] - 29s 751ms/step - loss: 0.6548 - accuracy: 0.7476 - balanced\_recall: 0.5624 - balanced\_precision: 0.7680 - balanced\_f1\_score: 0.6466 - val\_loss: 0.7539 - val\_accuracy: 0.7013 - val\_balanced\_recall: 0.5008 - val\_balanced\_precision: 0.6552 - val\_balanced\_f1\_score: 0.5623

### Epoch 7/20

39/39 [=====] - 27s 691ms/step - loss: 0.6324 - accuracy: 0.7541 - balanced\_recall: 0.5982 - balanced\_precision: 0.8015 - balanced\_f1\_score: 0.6827 -



val\_loss: 0.7421 - val\_accuracy: 0.6981 - val\_balanced\_recall: 0.5416 - val\_balanced\_precision:  
0.7094 - val\_balanced\_f1\_score: 0.6089

Epoch 8/20

39/39 [=====] - 32s 815ms/step - loss: 0.6119 - accuracy:  
0.7638 - balanced\_recall: 0.6114 - balanced\_precision: 0.7792 - balanced\_f1\_score: 0.6819 -  
val\_loss: 0.7301 - val\_accuracy: 0.7045 - val\_balanced\_recall: 0.5430 - val\_balanced\_precision:  
0.7230 - val\_balanced\_f1\_score: 0.6152

Epoch 9/20

39/39 [=====] - 27s 708ms/step - loss: 0.5907 - accuracy:  
0.7793 - balanced\_recall: 0.6574 - balanced\_precision: 0.8378 - balanced\_f1\_score: 0.7351 -  
val\_loss: 0.7262 - val\_accuracy: 0.7078 - val\_balanced\_recall: 0.5399 - val\_balanced\_precision:  
0.7446 - val\_balanced\_f1\_score: 0.6232

Epoch 10/20

39/39 [=====] - 25s 632ms/step - loss: 0.5771 - accuracy:  
0.7801 - balanced\_recall: 0.6458 - balanced\_precision: 0.8335 - balanced\_f1\_score: 0.7259 -  
val\_loss: 0.7185 - val\_accuracy: 0.6916 - val\_balanced\_recall: 0.5658 - val\_balanced\_precision:  
0.7619 - val\_balanced\_f1\_score: 0.6479

Epoch 11/20

39/39 [=====] - 29s 747ms/step - loss: 0.5666 - accuracy:  
0.7899 - balanced\_recall: 0.6719 - balanced\_precision: 0.8507 - balanced\_f1\_score: 0.7478 -  
val\_loss: 0.7131 - val\_accuracy: 0.6916 - val\_balanced\_recall: 0.5525 - val\_balanced\_precision:  
0.7372 - val\_balanced\_f1\_score: 0.6305

Epoch 12/20

39/39 [=====] - 26s 669ms/step - loss: 0.5597 - accuracy:  
0.7809 - balanced\_recall: 0.6542 - balanced\_precision: 0.8074 - balanced\_f1\_score: 0.7206 -  
val\_loss: 0.7036 - val\_accuracy: 0.7078 - val\_balanced\_recall: 0.5679 - val\_balanced\_precision:  
0.7312 - val\_balanced\_f1\_score: 0.6374

Epoch 13/20

39/39 [=====] - 19s 488ms/step - loss: 0.5541 - accuracy:  
0.7964 - balanced\_recall: 0.6779 - balanced\_precision: 0.8400 - balanced\_f1\_score: 0.7479 -  
val\_loss: 0.7102 - val\_accuracy: 0.7143 - val\_balanced\_recall: 0.5899 - val\_balanced\_precision:  
0.7271 - val\_balanced\_f1\_score: 0.6502

Epoch 14/20

39/39 [=====] - 20s 517ms/step - loss: 0.5392 - accuracy:  
0.7964 - balanced\_recall: 0.6826 - balanced\_precision: 0.8392 - balanced\_f1\_score: 0.7506 -  
val\_loss: 0.7061 - val\_accuracy: 0.7143 - val\_balanced\_recall: 0.5949 - val\_balanced\_precision:  
0.7355 - val\_balanced\_f1\_score: 0.6558

Epoch 15/20

39/39 [=====] - 28s 726ms/step - loss: 0.5323 - accuracy:  
0.7907 - balanced\_recall: 0.6882 - balanced\_precision: 0.8284 - balanced\_f1\_score: 0.7503 -  
val\_loss: 0.6947 - val\_accuracy: 0.7078 - val\_balanced\_recall: 0.5837 - val\_balanced\_precision:  
0.7269 - val\_balanced\_f1\_score: 0.6458

Epoch 16/20

39/39 [=====] - 19s 494ms/step - loss: 0.5253 - accuracy: 0.8086 - balanced\_recall: 0.7086 - balanced\_precision: 0.8519 - balanced\_f1\_score: 0.7718 - val\_loss: 0.6977 - val\_accuracy: 0.7208 - val\_balanced\_recall: 0.6012 - val\_balanced\_precision: 0.7278 - val\_balanced\_f1\_score: 0.6571

Epoch 17/20

39/39 [=====] - 20s 505ms/step - loss: 0.5154 - accuracy: 0.8094 - balanced\_recall: 0.7129 - balanced\_precision: 0.8344 - balanced\_f1\_score: 0.7672 - val\_loss: 0.6981 - val\_accuracy: 0.7110 - val\_balanced\_recall: 0.5970 - val\_balanced\_precision: 0.7274 - val\_balanced\_f1\_score: 0.6544

Epoch 18/20

39/39 [=====] - 24s 611ms/step - loss: 0.5150 - accuracy: 0.7997 - balanced\_recall: 0.7130 - balanced\_precision: 0.8457 - balanced\_f1\_score: 0.7725 - val\_loss: 0.6949 - val\_accuracy: 0.7208 - val\_balanced\_recall: 0.6006 - val\_balanced\_precision: 0.7272 - val\_balanced\_f1\_score: 0.6565

RUN #3

Epoch 1/20

39/39 [=====] - 59s 727ms/step - loss: 1.0308 - accuracy: 0.4829 - balanced\_recall: 0.2170 - balanced\_precision: 0.4028 - balanced\_f1\_score: 0.2692 - val\_loss: 0.9150 - val\_accuracy: 0.6169 - val\_balanced\_recall: 0.3182 - val\_balanced\_precision: 0.5511 - val\_balanced\_f1\_score: 0.3938

Epoch 2/20

39/39 [=====] - 22s 569ms/step - loss: 0.8598 - accuracy: 0.6246 - balanced\_recall: 0.3575 - balanced\_precision: 0.5178 - balanced\_f1\_score: 0.4189 - val\_loss: 0.8271 - val\_accuracy: 0.6429 - val\_balanced\_recall: 0.3900 - val\_balanced\_precision: 0.6240 - val\_balanced\_f1\_score: 0.4715

Epoch 3/20

39/39 [=====] - 26s 677ms/step - loss: 0.7920 - accuracy: 0.6661 - balanced\_recall: 0.4391 - balanced\_precision: 0.6657 - balanced\_f1\_score: 0.5249 - val\_loss: 0.7857 - val\_accuracy: 0.6494 - val\_balanced\_recall: 0.4407 - val\_balanced\_precision: 0.6769 - val\_balanced\_f1\_score: 0.5293

Epoch 4/20

39/39 [=====] - 28s 731ms/step - loss: 0.7308 - accuracy: 0.6963 - balanced\_recall: 0.4818 - balanced\_precision: 0.7382 - balanced\_f1\_score: 0.5786 - val\_loss: 0.7531 - val\_accuracy: 0.6981 - val\_balanced\_recall: 0.5292 - val\_balanced\_precision: 0.6336 - val\_balanced\_f1\_score: 0.5697

Epoch 5/20

39/39 [=====] - 27s 694ms/step - loss: 0.6949 - accuracy: 0.7231 - balanced\_recall: 0.5385 - balanced\_precision: 0.7284 - balanced\_f1\_score: 0.6149 - val\_loss: 0.7294 - val\_accuracy: 0.6916 - val\_balanced\_recall: 0.5196 - val\_balanced\_precision: 0.6250 - val\_balanced\_f1\_score: 0.5632

Epoch 6/20

39/39 [=====] - 26s 681ms/step - loss: 0.6603 - accuracy: 0.7443 - balanced\_recall: 0.5608 - balanced\_precision: 0.7537 - balanced\_f1\_score: 0.6387 - val\_loss: 0.7027 - val\_accuracy: 0.7143 - val\_balanced\_recall: 0.5616 - val\_balanced\_precision: 0.7696 - val\_balanced\_f1\_score: 0.6452

Epoch 7/20

39/39 [=====] - 26s 674ms/step - loss: 0.6313 - accuracy: 0.7557 - balanced\_recall: 0.5972 - balanced\_precision: 0.7905 - balanced\_f1\_score: 0.6776 - val\_loss: 0.6880 - val\_accuracy: 0.7078 - val\_balanced\_recall: 0.5644 - val\_balanced\_precision: 0.7438 - val\_balanced\_f1\_score: 0.6362

Epoch 8/20

39/39 [=====] - 25s 646ms/step - loss: 0.6151 - accuracy: 0.7565 - balanced\_recall: 0.6140 - balanced\_precision: 0.7844 - balanced\_f1\_score: 0.6857 - val\_loss: 0.6770 - val\_accuracy: 0.7305 - val\_balanced\_recall: 0.5923 - val\_balanced\_precision: 0.7698 - val\_balanced\_f1\_score: 0.6651

Epoch 9/20

39/39 [=====] - 28s 734ms/step - loss: 0.6076 - accuracy: 0.7573 - balanced\_recall: 0.6267 - balanced\_precision: 0.7997 - balanced\_f1\_score: 0.7005 - val\_loss: 0.6673 - val\_accuracy: 0.7240 - val\_balanced\_recall: 0.5987 - val\_balanced\_precision: 0.7727 - val\_balanced\_f1\_score: 0.6711

Epoch 10/20

39/39 [=====] - 24s 626ms/step - loss: 0.5992 - accuracy: 0.7630 - balanced\_recall: 0.6316 - balanced\_precision: 0.8143 - balanced\_f1\_score: 0.7087 - val\_loss: 0.6592 - val\_accuracy: 0.7305 - val\_balanced\_recall: 0.6089 - val\_balanced\_precision: 0.7785 - val\_balanced\_f1\_score: 0.6797

Epoch 11/20

39/39 [=====] - 20s 512ms/step - loss: 0.5738 - accuracy: 0.7777 - balanced\_recall: 0.6517 - balanced\_precision: 0.8274 - balanced\_f1\_score: 0.7270 - val\_loss: 0.6721 - val\_accuracy: 0.7208 - val\_balanced\_recall: 0.6371 - val\_balanced\_precision: 0.7713 - val\_balanced\_f1\_score: 0.6970

Epoch 12/20

39/39 [=====] - 27s 706ms/step - loss: 0.5820 - accuracy: 0.7704 - balanced\_recall: 0.6698 - balanced\_precision: 0.8050 - balanced\_f1\_score: 0.7295 - val\_loss: 0.6490 - val\_accuracy: 0.7338 - val\_balanced\_recall: 0.6257 - val\_balanced\_precision: 0.8078 - val\_balanced\_f1\_score: 0.7036

Epoch 13/20

39/39 [=====] - 27s 710ms/step - loss: 0.5613 - accuracy: 0.7899 - balanced\_recall: 0.6656 - balanced\_precision: 0.8161 - balanced\_f1\_score: 0.7319 - val\_loss: 0.6465 - val\_accuracy: 0.7273 - val\_balanced\_recall: 0.6431 - val\_balanced\_precision: 0.8048 - val\_balanced\_f1\_score: 0.7143

Epoch 14/20

39/39 [=====] - 28s 718ms/step - loss: 0.5497 - accuracy: 0.7834 - balanced\_recall: 0.6762 - balanced\_precision: 0.8205 - balanced\_f1\_score: 0.7403 - val\_loss: 0.6411 - val\_accuracy: 0.7435 - val\_balanced\_recall: 0.6471 - val\_balanced\_precision: 0.8024 - val\_balanced\_f1\_score: 0.7160

Epoch 15/20

39/39 [=====] - 28s 738ms/step - loss: 0.5489 - accuracy: 0.7834 - balanced\_recall: 0.6660 - balanced\_precision: 0.8193 - balanced\_f1\_score: 0.7332 - val\_loss: 0.6395 - val\_accuracy: 0.7305 - val\_balanced\_recall: 0.6496 - val\_balanced\_precision: 0.7988 - val\_balanced\_f1\_score: 0.7160

Epoch 16/20

39/39 [=====] - 18s 469ms/step - loss: 0.5468 - accuracy: 0.7891 - balanced\_recall: 0.6664 - balanced\_precision: 0.8190 - balanced\_f1\_score: 0.7326 - val\_loss: 0.6472 - val\_accuracy: 0.7500 - val\_balanced\_recall: 0.6725 - val\_balanced\_precision: 0.7799 - val\_balanced\_f1\_score: 0.7218

Epoch 17/20

39/39 [=====] - 18s 475ms/step - loss: 0.5388 - accuracy: 0.7858 - balanced\_recall: 0.6972 - balanced\_precision: 0.8313 - balanced\_f1\_score: 0.7569 - val\_loss: 0.6432 - val\_accuracy: 0.7338 - val\_balanced\_recall: 0.6617 - val\_balanced\_precision: 0.7833 - val\_balanced\_f1\_score: 0.7160

Epoch 18/20

39/39 [=====] - 45s 1s/step - loss: 0.5287 - accuracy: 0.7964 - balanced\_recall: 0.6993 - balanced\_precision: 0.8255 - balanced\_f1\_score: 0.7558 - val\_loss: 0.6405 - val\_accuracy: 0.7305 - val\_balanced\_recall: 0.6617 - val\_balanced\_precision: 0.7748 - val\_balanced\_f1\_score: 0.7131

RUN #4

Epoch 1/20

39/39 [=====] - 51s 643ms/step - loss: 1.0124 - accuracy: 0.5098 - balanced\_recall: 0.2408 - balanced\_precision: 0.4050 - balanced\_f1\_score: 0.2978 - val\_loss: 0.9257 - val\_accuracy: 0.5844 - val\_balanced\_recall: 0.2162 - val\_balanced\_precision: 0.4185 - val\_balanced\_f1\_score: 0.2801

Epoch 2/20

39/39 [=====] - 19s 476ms/step - loss: 0.8625 - accuracy: 0.6189 - balanced\_recall: 0.3589 - balanced\_precision: 0.5586 - balanced\_f1\_score: 0.4301 - val\_loss: 0.8382 - val\_accuracy: 0.6721 - val\_balanced\_recall: 0.3627 - val\_balanced\_precision: 0.5676 - val\_balanced\_f1\_score: 0.4350

Epoch 3/20

39/39 [=====] - 21s 543ms/step - loss: 0.7808 - accuracy: 0.6710 - balanced\_recall: 0.4281 - balanced\_precision: 0.6673 - balanced\_f1\_score: 0.5170 - val\_loss: 0.8028 - val\_accuracy: 0.6786 - val\_balanced\_recall: 0.4816 - val\_balanced\_precision: 0.5023 - val\_balanced\_f1\_score: 0.4897

Epoch 4/20

39/39 [=====] - 18s 456ms/step - loss: 0.7294 - accuracy: 0.7125 - balanced\_recall: 0.5031 - balanced\_precision: 0.7391 - balanced\_f1\_score: 0.5956 - val\_loss: 0.7657 - val\_accuracy: 0.6786 - val\_balanced\_recall: 0.5123 - val\_balanced\_precision: 0.5763 - val\_balanced\_f1\_score: 0.5391

Epoch 5/20

39/39 [=====] - 20s 508ms/step - loss: 0.6977 - accuracy: 0.7191 - balanced\_recall: 0.5362 - balanced\_precision: 0.7042 - balanced\_f1\_score: 0.6035 - val\_loss: 0.7387 - val\_accuracy: 0.7305 - val\_balanced\_recall: 0.5274 - val\_balanced\_precision: 0.6212 - val\_balanced\_f1\_score: 0.5662

Epoch 6/20

39/39 [=====] - 16s 406ms/step - loss: 0.6621 - accuracy: 0.7427 - balanced\_recall: 0.5581 - balanced\_precision: 0.7807 - balanced\_f1\_score: 0.6476 - val\_loss: 0.7477 - val\_accuracy: 0.7110 - val\_balanced\_recall: 0.5281 - val\_balanced\_precision: 0.6558 - val\_balanced\_f1\_score: 0.5809

Epoch 7/20

39/39 [=====] - 20s 523ms/step - loss: 0.6530 - accuracy: 0.7353 - balanced\_recall: 0.5810 - balanced\_precision: 0.8046 - balanced\_f1\_score: 0.6710 - val\_loss: 0.7026 - val\_accuracy: 0.7435 - val\_balanced\_recall: 0.5591 - val\_balanced\_precision: 0.7458 - val\_balanced\_f1\_score: 0.6319

Epoch 8/20

39/39 [=====] - 20s 527ms/step - loss: 0.6245 - accuracy: 0.7533 - balanced\_recall: 0.5843 - balanced\_precision: 0.7842 - balanced\_f1\_score: 0.6668 - val\_loss: 0.7014 - val\_accuracy: 0.7403 - val\_balanced\_recall: 0.5727 - val\_balanced\_precision: 0.7569 - val\_balanced\_f1\_score: 0.6463

Epoch 9/20

39/39 [=====] - 18s 452ms/step - loss: 0.6109 - accuracy: 0.7508 - balanced\_recall: 0.6259 - balanced\_precision: 0.7879 - balanced\_f1\_score: 0.6951 - val\_loss: 0.7057 - val\_accuracy: 0.7305 - val\_balanced\_recall: 0.5730 - val\_balanced\_precision: 0.7542 - val\_balanced\_f1\_score: 0.6454

Epoch 10/20

39/39 [=====] - 20s 503ms/step - loss: 0.5912 - accuracy: 0.7671 - balanced\_recall: 0.6371 - balanced\_precision: 0.8118 - balanced\_f1\_score: 0.7114 - val\_loss: 0.6697 - val\_accuracy: 0.7727 - val\_balanced\_recall: 0.6189 - val\_balanced\_precision: 0.8352 - val\_balanced\_f1\_score: 0.7069

Epoch 11/20

39/39 [=====] - 18s 464ms/step - loss: 0.5813 - accuracy: 0.7793 - balanced\_recall: 0.6389 - balanced\_precision: 0.8162 - balanced\_f1\_score: 0.7141 - val\_loss: 0.6923 - val\_accuracy: 0.7370 - val\_balanced\_recall: 0.5816 - val\_balanced\_precision: 0.7870 - val\_balanced\_f1\_score: 0.6619

Epoch 12/20

39/39 [=====] - 20s 523ms/step - loss: 0.5810 - accuracy: 0.7712 - balanced\_recall: 0.6529 - balanced\_precision: 0.8136 - balanced\_f1\_score: 0.7223 - val\_loss: 0.6512 - val\_accuracy: 0.7630 - val\_balanced\_recall: 0.6141 - val\_balanced\_precision: 0.8197 - val\_balanced\_f1\_score: 0.7001

Epoch 13/20

39/39 [=====] - 20s 528ms/step - loss: 0.5651 - accuracy: 0.7793 - balanced\_recall: 0.6572 - balanced\_precision: 0.8156 - balanced\_f1\_score: 0.7258 - val\_loss: 0.6479 - val\_accuracy: 0.7500 - val\_balanced\_recall: 0.6144 - val\_balanced\_precision: 0.8181 - val\_balanced\_f1\_score: 0.6998

Epoch 14/20

39/39 [=====] - 18s 456ms/step - loss: 0.5566 - accuracy: 0.7883 - balanced\_recall: 0.6708 - balanced\_precision: 0.8093 - balanced\_f1\_score: 0.7317 - val\_loss: 0.6842 - val\_accuracy: 0.7273 - val\_balanced\_recall: 0.5936 - val\_balanced\_precision: 0.7800 - val\_balanced\_f1\_score: 0.6684

Epoch 15/20

39/39 [=====] - 18s 454ms/step - loss: 0.5561 - accuracy: 0.7907 - balanced\_recall: 0.6725 - balanced\_precision: 0.7977 - balanced\_f1\_score: 0.7278 - val\_loss: 0.6691 - val\_accuracy: 0.7468 - val\_balanced\_recall: 0.5866 - val\_balanced\_precision: 0.8189 - val\_balanced\_f1\_score: 0.6804

Epoch 16/20

39/39 [=====] - 20s 511ms/step - loss: 0.5408 - accuracy: 0.7891 - balanced\_recall: 0.6972 - balanced\_precision: 0.8380 - balanced\_f1\_score: 0.7579 - val\_loss: 0.6338 - val\_accuracy: 0.7630 - val\_balanced\_recall: 0.6513 - val\_balanced\_precision: 0.8192 - val\_balanced\_f1\_score: 0.7243

Epoch 17/20

39/39 [=====] - 16s 412ms/step - loss: 0.5436 - accuracy: 0.7948 - balanced\_recall: 0.6979 - balanced\_precision: 0.8133 - balanced\_f1\_score: 0.7501 - val\_loss: 0.6488 - val\_accuracy: 0.7597 - val\_balanced\_recall: 0.6224 - val\_balanced\_precision: 0.8240 - val\_balanced\_f1\_score: 0.7065

Epoch 18/20

39/39 [=====] - 18s 469ms/step - loss: 0.5296 - accuracy: 0.8005 - balanced\_recall: 0.6853 - balanced\_precision: 0.8432 - balanced\_f1\_score: 0.7533 - val\_loss: 0.6661 - val\_accuracy: 0.7435 - val\_balanced\_recall: 0.5965 - val\_balanced\_precision: 0.8102 - val\_balanced\_f1\_score: 0.6838

Epoch 19/20

39/39 [=====] - 20s 510ms/step - loss: 0.5232 - accuracy: 0.7980 - balanced\_recall: 0.6858 - balanced\_precision: 0.8121 - balanced\_f1\_score: 0.7421 - val\_loss: 0.6509 - val\_accuracy: 0.7597 - val\_balanced\_recall: 0.6381 - val\_balanced\_precision: 0.8033 - val\_balanced\_f1\_score: 0.7075

RUN #5

Epoch 1/20

39/39 [=====] - 64s 681ms/step - loss: 1.0380 - accuracy: 0.4894 - balanced\_recall: 0.2135 - balanced\_precision: 0.3823 - balanced\_f1\_score: 0.2667 - val\_loss: 0.9256 - val\_accuracy: 0.5942 - val\_balanced\_recall: 0.3310 - val\_balanced\_precision: 0.5026 - val\_balanced\_f1\_score: 0.3966

Epoch 2/20

39/39 [=====] - 18s 471ms/step - loss: 0.8767 - accuracy: 0.6238 - balanced\_recall: 0.3655 - balanced\_precision: 0.5449 - balanced\_f1\_score: 0.4335 - val\_loss: 0.8277 - val\_accuracy: 0.6396 - val\_balanced\_recall: 0.3793 - val\_balanced\_precision: 0.5273 - val\_balanced\_f1\_score: 0.4387

Epoch 3/20

39/39 [=====] - 19s 493ms/step - loss: 0.7819 - accuracy: 0.6694 - balanced\_recall: 0.4462 - balanced\_precision: 0.6564 - balanced\_f1\_score: 0.5262 - val\_loss: 0.7695 - val\_accuracy: 0.6461 - val\_balanced\_recall: 0.4482 - val\_balanced\_precision: 0.6051 - val\_balanced\_f1\_score: 0.5112

Epoch 4/20

39/39 [=====] - 21s 536ms/step - loss: 0.7325 - accuracy: 0.7003 - balanced\_recall: 0.4972 - balanced\_precision: 0.7189 - balanced\_f1\_score: 0.5829 - val\_loss: 0.7372 - val\_accuracy: 0.6721 - val\_balanced\_recall: 0.5013 - val\_balanced\_precision: 0.6652 - val\_balanced\_f1\_score: 0.5658

Epoch 5/20

39/39 [=====] - 21s 530ms/step - loss: 0.7052 - accuracy: 0.7060 - balanced\_recall: 0.5408 - balanced\_precision: 0.7193 - balanced\_f1\_score: 0.6114 - val\_loss: 0.7091 - val\_accuracy: 0.6948 - val\_balanced\_recall: 0.5292 - val\_balanced\_precision: 0.7386 - val\_balanced\_f1\_score: 0.6133

Epoch 6/20

39/39 [=====] - 20s 519ms/step - loss: 0.6691 - accuracy: 0.7288 - balanced\_recall: 0.5545 - balanced\_precision: 0.7706 - balanced\_f1\_score: 0.6414 - val\_loss: 0.6933 - val\_accuracy: 0.7240 - val\_balanced\_recall: 0.5315 - val\_balanced\_precision: 0.7192 - val\_balanced\_f1\_score: 0.6076

Epoch 7/20

39/39 [=====] - 20s 507ms/step - loss: 0.6389 - accuracy: 0.7565 - balanced\_recall: 0.6018 - balanced\_precision: 0.8204 - balanced\_f1\_score: 0.6911 - val\_loss: 0.6788 - val\_accuracy: 0.7175 - val\_balanced\_recall: 0.5512 - val\_balanced\_precision: 0.7255 - val\_balanced\_f1\_score: 0.6232

Epoch 8/20

39/39 [=====] - 20s 519ms/step - loss: 0.6317 - accuracy: 0.7435 - balanced\_recall: 0.6101 - balanced\_precision: 0.7771 - balanced\_f1\_score: 0.6802 - val\_loss: 0.6673 - val\_accuracy: 0.7305 - val\_balanced\_recall: 0.5557 - val\_balanced\_precision: 0.7203 - val\_balanced\_f1\_score: 0.6238

Epoch 9/20

39/39 [=====] - 21s 529ms/step - loss: 0.6110 - accuracy: 0.7630 - balanced\_recall: 0.6254 - balanced\_precision: 0.7987 - balanced\_f1\_score: 0.6993 - val\_loss: 0.6639 - val\_accuracy: 0.7305 - val\_balanced\_recall: 0.5585 - val\_balanced\_precision: 0.7250 - val\_balanced\_f1\_score: 0.6299

Epoch 10/20

39/39 [=====] - 18s 466ms/step - loss: 0.6031 - accuracy: 0.7647 - balanced\_recall: 0.6239 - balanced\_precision: 0.8058 - balanced\_f1\_score: 0.7012 - val\_loss: 0.6577 - val\_accuracy: 0.7208 - val\_balanced\_recall: 0.5657 - val\_balanced\_precision: 0.6985 - val\_balanced\_f1\_score: 0.6220

Epoch 11/20

39/39 [=====] - 20s 505ms/step - loss: 0.5963 - accuracy: 0.7590 - balanced\_recall: 0.6516 - balanced\_precision: 0.7972 - balanced\_f1\_score: 0.7144 - val\_loss: 0.6507 - val\_accuracy: 0.7273 - val\_balanced\_recall: 0.5781 - val\_balanced\_precision: 0.7411 - val\_balanced\_f1\_score: 0.6471

Epoch 12/20

39/39 [=====] - 18s 460ms/step - loss: 0.5744 - accuracy: 0.7761 - balanced\_recall: 0.6679 - balanced\_precision: 0.8173 - balanced\_f1\_score: 0.7334 - val\_loss: 0.6429 - val\_accuracy: 0.7240 - val\_balanced\_recall: 0.5827 - val\_balanced\_precision: 0.7523 - val\_balanced\_f1\_score: 0.6541

Epoch 13/20

39/39 [=====] - 18s 468ms/step - loss: 0.5864 - accuracy: 0.7622 - balanced\_recall: 0.6551 - balanced\_precision: 0.8046 - balanced\_f1\_score: 0.7193 - val\_loss: 0.6521 - val\_accuracy: 0.7468 - val\_balanced\_recall: 0.6375 - val\_balanced\_precision: 0.7820 - val\_balanced\_f1\_score: 0.7010

Epoch 14/20

39/39 [=====] - 20s 517ms/step - loss: 0.5594 - accuracy: 0.7891 - balanced\_recall: 0.6654 - balanced\_precision: 0.8077 - balanced\_f1\_score: 0.7278 - val\_loss: 0.6383 - val\_accuracy: 0.7468 - val\_balanced\_recall: 0.6122 - val\_balanced\_precision: 0.7645 - val\_balanced\_f1\_score: 0.6767

Epoch 15/20

39/39 [=====] - 20s 527ms/step - loss: 0.5531 - accuracy: 0.7785 - balanced\_recall: 0.6660 - balanced\_precision: 0.8133 - balanced\_f1\_score: 0.7309 - val\_loss: 0.6336 - val\_accuracy: 0.7240 - val\_balanced\_recall: 0.5880 - val\_balanced\_precision: 0.7458 - val\_balanced\_f1\_score: 0.6557

Epoch 16/20

39/39 [=====] - 20s 509ms/step - loss: 0.5538 - accuracy: 0.7875 - balanced\_recall: 0.6778 - balanced\_precision: 0.8202 - balanced\_f1\_score: 0.7406 - val\_loss: 0.6321 - val\_accuracy: 0.7435 - val\_balanced\_recall: 0.6107 - val\_balanced\_precision: 0.7580 - val\_balanced\_f1\_score: 0.6743

Epoch 17/20

39/39 [=====] - 18s 465ms/step - loss: 0.5440 - accuracy: 0.7989 - balanced\_recall: 0.6998 - balanced\_precision: 0.8354 - balanced\_f1\_score: 0.7598 - val\_loss: 0.6309 - val\_accuracy: 0.7435 - val\_balanced\_recall: 0.6074 - val\_balanced\_precision: 0.7602 - val\_balanced\_f1\_score: 0.6725

Epoch 18/20

39/39 [=====] - 18s 469ms/step - loss: 0.5349 - accuracy: 0.8021 - balanced\_recall: 0.6944 - balanced\_precision: 0.8268 - balanced\_f1\_score: 0.7537 - val\_loss: 0.6374 - val\_accuracy: 0.7305 - val\_balanced\_recall: 0.5927 - val\_balanced\_precision: 0.7358 - val\_balanced\_f1\_score: 0.6542

Epoch 19/20

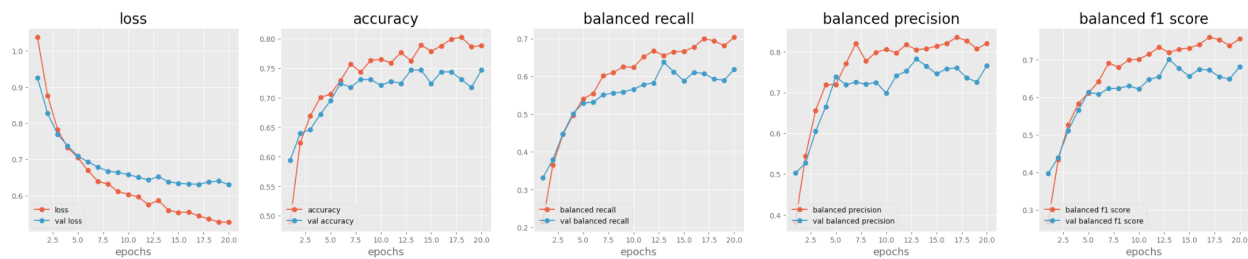
39/39 [=====] - 16s 416ms/step - loss: 0.5262 - accuracy: 0.7858 - balanced\_recall: 0.6811 - balanced\_precision: 0.8071 - balanced\_f1\_score: 0.7373 - val\_loss: 0.6399 - val\_accuracy: 0.7175 - val\_balanced\_recall: 0.5897 - val\_balanced\_precision: 0.7260 - val\_balanced\_f1\_score: 0.6483

Epoch 20/20

39/39 [=====] - 20s 522ms/step - loss: 0.5264 - accuracy: 0.7883 - balanced\_recall: 0.7036 - balanced\_precision: 0.8206 - balanced\_f1\_score: 0.7556 -



val\_loss: 0.6300 - val\_accuracy: 0.7468 - val\_balanced\_recall: 0.6185 - val\_balanced\_precision: 0.7659 - val\_balanced\_f1\_score: 0.6808



HICKS LARGE CAT - 7/16/2023

## RUN #1

Epoch 1/20

13/13 [=====] - 36s 1s/step - loss: 1.6582 - accuracy: 0.2654 - balanced\_recall: 0.0122 - balanced\_precision: 0.0486 - balanced\_f1\_score: 0.0179 - val\_loss: 1.4936 - val\_accuracy: 0.3431 - val\_balanced\_recall: 0.0144 - val\_balanced\_precision: 0.1250 - val\_balanced\_f1\_score: 0.0258

Epoch 2/20

13/13 [=====] - 9s 699ms/step - loss: 1.4453 - accuracy: 0.3784 - balanced\_recall: 0.0547 - balanced\_precision: 0.1133 - balanced\_f1\_score: 0.0662 - val\_loss: 1.4239 - val\_accuracy: 0.3824 - val\_balanced\_recall: 0.0106 - val\_balanced\_precision: 0.0750 - val\_balanced\_f1\_score: 0.0185

Epoch 3/20

13/13 [=====] - 9s 740ms/step - loss: 1.3662 - accuracy: 0.4054 - balanced\_recall: 0.0564 - balanced\_precision: 0.1928 - balanced\_f1\_score: 0.0853 - val\_loss: 1.3552 - val\_accuracy: 0.4020 - val\_balanced\_recall: 0.0328 - val\_balanced\_precision: 0.1317 - val\_balanced\_f1\_score: 0.0504

Epoch 4/20

13/13 [=====] - 11s 857ms/step - loss: 1.2828 - accuracy: 0.4963 - balanced\_recall: 0.0707 - balanced\_precision: 0.2754 - balanced\_f1\_score: 0.1104 - val\_loss: 1.2853 - val\_accuracy: 0.4804 - val\_balanced\_recall: 0.0368 - val\_balanced\_precision: 0.2208 - val\_balanced\_f1\_score: 0.0625

Epoch 5/20

13/13 [=====] - 11s 893ms/step - loss: 1.1925 - accuracy: 0.5111 - balanced\_recall: 0.1048 - balanced\_precision: 0.3506 - balanced\_f1\_score: 0.1598 -

val\_loss: 1.2395 - val\_accuracy: 0.4510 - val\_balanced\_recall: 0.0660 - val\_balanced\_precision: 0.2208 - val\_balanced\_f1\_score: 0.1013

Epoch 6/20

13/13 [=====] - 12s 946ms/step - loss: 1.1482 - accuracy: 0.5897 - balanced\_recall: 0.1251 - balanced\_precision: 0.3882 - balanced\_f1\_score: 0.1882 - val\_loss: 1.2042 - val\_accuracy: 0.5294 - val\_balanced\_recall: 0.0907 - val\_balanced\_precision: 0.3233 - val\_balanced\_f1\_score: 0.1413

Epoch 7/20

13/13 [=====] - 10s 802ms/step - loss: 1.0849 - accuracy: 0.5995 - balanced\_recall: 0.1655 - balanced\_precision: 0.4218 - balanced\_f1\_score: 0.2333 - val\_loss: 1.1713 - val\_accuracy: 0.4902 - val\_balanced\_recall: 0.1184 - val\_balanced\_precision: 0.2942 - val\_balanced\_f1\_score: 0.1675

Epoch 8/20

13/13 [=====] - 10s 821ms/step - loss: 1.0609 - accuracy: 0.6192 - balanced\_recall: 0.1835 - balanced\_precision: 0.4591 - balanced\_f1\_score: 0.2575 - val\_loss: 1.1430 - val\_accuracy: 0.6078 - val\_balanced\_recall: 0.1090 - val\_balanced\_precision: 0.3133 - val\_balanced\_f1\_score: 0.1615

Epoch 9/20

13/13 [=====] - 10s 797ms/step - loss: 0.9949 - accuracy: 0.6536 - balanced\_recall: 0.2323 - balanced\_precision: 0.5721 - balanced\_f1\_score: 0.3243 - val\_loss: 1.1207 - val\_accuracy: 0.5686 - val\_balanced\_recall: 0.1129 - val\_balanced\_precision: 0.2900 - val\_balanced\_f1\_score: 0.1609

Epoch 10/20

13/13 [=====] - 13s 1s/step - loss: 0.9886 - accuracy: 0.6953 - balanced\_recall: 0.2254 - balanced\_precision: 0.4951 - balanced\_f1\_score: 0.3076 - val\_loss: 1.0946 - val\_accuracy: 0.5980 - val\_balanced\_recall: 0.1040 - val\_balanced\_precision: 0.2842 - val\_balanced\_f1\_score: 0.1516

Epoch 11/20

13/13 [=====] - 10s 765ms/step - loss: 0.9564 - accuracy: 0.6732 - balanced\_recall: 0.2671 - balanced\_precision: 0.4468 - balanced\_f1\_score: 0.3318 - val\_loss: 1.0729 - val\_accuracy: 0.5686 - val\_balanced\_recall: 0.1658 - val\_balanced\_precision: 0.3152 - val\_balanced\_f1\_score: 0.2158

Epoch 12/20

13/13 [=====] - 13s 1s/step - loss: 0.9263 - accuracy: 0.6609 - balanced\_recall: 0.2827 - balanced\_precision: 0.5492 - balanced\_f1\_score: 0.3714 - val\_loss: 1.0559 - val\_accuracy: 0.6078 - val\_balanced\_recall: 0.1697 - val\_balanced\_precision: 0.3624 - val\_balanced\_f1\_score: 0.2290

Epoch 13/20

13/13 [=====] - 13s 1s/step - loss: 0.8979 - accuracy: 0.7125 - balanced\_recall: 0.3396 - balanced\_precision: 0.6523 - balanced\_f1\_score: 0.4423 - val\_loss: 1.0446 - val\_accuracy: 0.5882 - val\_balanced\_recall: 0.1985 - val\_balanced\_precision: 0.4312 - val\_balanced\_f1\_score: 0.2709

Epoch 14/20

13/13 [=====] - 14s 1s/step - loss: 0.8614 - accuracy: 0.7248 - balanced\_recall: 0.3646 - balanced\_precision: 0.7240 - balanced\_f1\_score: 0.4839 - val\_loss: 1.0291 - val\_accuracy: 0.5882 - val\_balanced\_recall: 0.2169 - val\_balanced\_precision: 0.4132 - val\_balanced\_f1\_score: 0.2831

Epoch 15/20

13/13 [=====] - 13s 1s/step - loss: 0.8577 - accuracy: 0.7150 - balanced\_recall: 0.3464 - balanced\_precision: 0.6206 - balanced\_f1\_score: 0.4422 - val\_loss: 1.0193 - val\_accuracy: 0.5980 - val\_balanced\_recall: 0.2899 - val\_balanced\_precision: 0.4731 - val\_balanced\_f1\_score: 0.3593

Epoch 16/20

13/13 [=====] - 11s 916ms/step - loss: 0.8424 - accuracy: 0.7592 - balanced\_recall: 0.3844 - balanced\_precision: 0.6658 - balanced\_f1\_score: 0.4848 - val\_loss: 1.0118 - val\_accuracy: 0.5784 - val\_balanced\_recall: 0.3023 - val\_balanced\_precision: 0.5483 - val\_balanced\_f1\_score: 0.3886

Epoch 17/20

13/13 [=====] - 13s 1s/step - loss: 0.8114 - accuracy: 0.7396 - balanced\_recall: 0.4797 - balanced\_precision: 0.7630 - balanced\_f1\_score: 0.5847 - val\_loss: 0.9997 - val\_accuracy: 0.5980 - val\_balanced\_recall: 0.3100 - val\_balanced\_precision: 0.5486 - val\_balanced\_f1\_score: 0.3948

Epoch 18/20

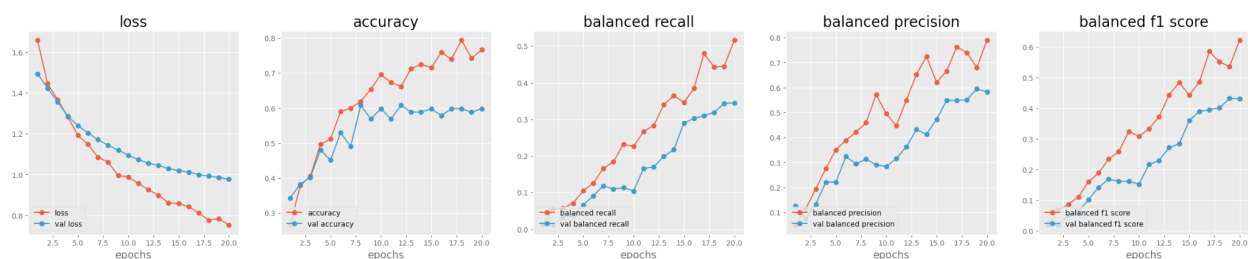
13/13 [=====] - 12s 936ms/step - loss: 0.7767 - accuracy: 0.7936 - balanced\_recall: 0.4427 - balanced\_precision: 0.7399 - balanced\_f1\_score: 0.5503 - val\_loss: 0.9928 - val\_accuracy: 0.5980 - val\_balanced\_recall: 0.3190 - val\_balanced\_precision: 0.5507 - val\_balanced\_f1\_score: 0.4007

Epoch 19/20

13/13 [=====] - 13s 1s/step - loss: 0.7840 - accuracy: 0.7420 - balanced\_recall: 0.4447 - balanced\_precision: 0.6796 - balanced\_f1\_score: 0.5360 - val\_loss: 0.9857 - val\_accuracy: 0.5882 - val\_balanced\_recall: 0.3434 - val\_balanced\_precision: 0.5945 - val\_balanced\_f1\_score: 0.4313

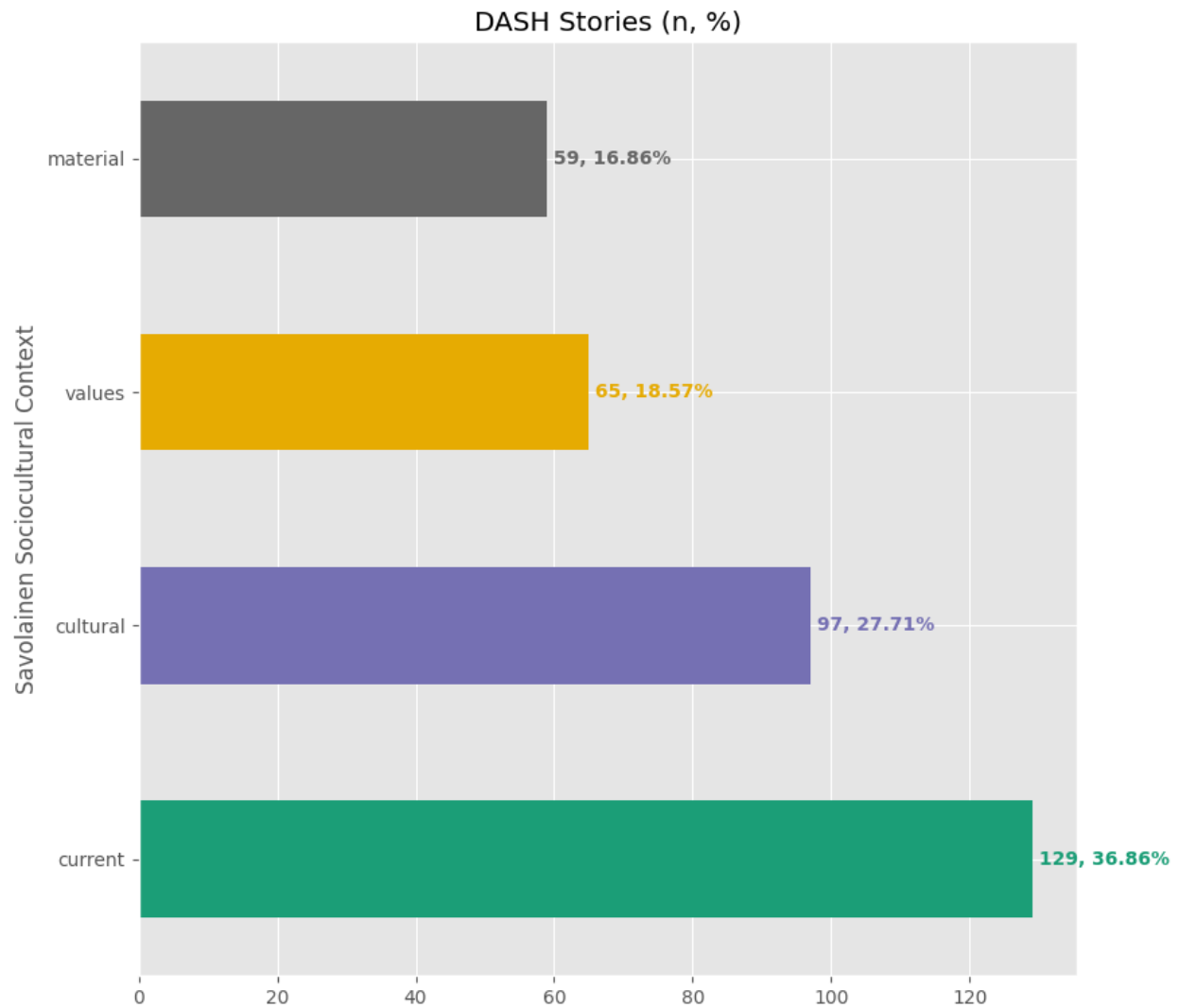
Epoch 20/20

13/13 [=====] - 13s 1s/step - loss: 0.7520 - accuracy: 0.7666 - balanced\_recall: 0.5160 - balanced\_precision: 0.7893 - balanced\_f1\_score: 0.6213 - val\_loss: 0.9766 - val\_accuracy: 0.5980 - val\_balanced\_recall: 0.3451 - val\_balanced\_precision: 0.5822 - val\_balanced\_f1\_score: 0.4304



## SAVOLAINEN SOCIOCULTURAL CONTEXT 7/16/2023

TRAINING DATA:



## RUN #1

Epoch 1/20

9/9 [=====] - 51s 2s/step - loss: 1.4225 - accuracy: 0.2893 -  
balanced\_recall: 0.0402 - balanced\_precision: 0.0533 - balanced\_f1\_score: 0.0445 - val\_loss:  
1.3425 - val\_accuracy: 0.4143 - val\_balanced\_recall: 0.0203 - val\_balanced\_precision: 0.0556 -  
val\_balanced\_f1\_score: 0.0289

Epoch 2/20

9/9 [=====] - 8s 890ms/step - loss: 1.3218 - accuracy: 0.3893 -  
balanced\_recall: 0.0584 - balanced\_precision: 0.2118 - balanced\_f1\_score: 0.0875 - val\_loss:  
1.3033 - val\_accuracy: 0.4000 - val\_balanced\_recall: 0.0069 - val\_balanced\_precision: 0.0278 -  
val\_balanced\_f1\_score: 0.0111

Epoch 3/20

9/9 [=====] - 19s 2s/step - loss: 1.2119 - accuracy: 0.4500 -  
balanced\_recall: 0.1375 - balanced\_precision: 0.3721 - balanced\_f1\_score: 0.1907 - val\_loss:  
1.2665 - val\_accuracy: 0.4143 - val\_balanced\_recall: 0.0470 - val\_balanced\_precision: 0.0976 -  
val\_balanced\_f1\_score: 0.0629

Epoch 4/20

9/9 [=====] - 9s 1s/step - loss: 1.1553 - accuracy: 0.4964 -  
balanced\_recall: 0.1372 - balanced\_precision: 0.4562 - balanced\_f1\_score: 0.2076 - val\_loss:  
1.2359 - val\_accuracy: 0.4857 - val\_balanced\_recall: 0.0406 - val\_balanced\_precision: 0.1083 -  
val\_balanced\_f1\_score: 0.0588

Epoch 5/20

9/9 [=====] - 22s 3s/step - loss: 1.1121 - accuracy: 0.5143 -  
balanced\_recall: 0.2152 - balanced\_precision: 0.5575 - balanced\_f1\_score: 0.3051 - val\_loss:  
1.2039 - val\_accuracy: 0.4857 - val\_balanced\_recall: 0.0470 - val\_balanced\_precision: 0.0972 -  
val\_balanced\_f1\_score: 0.0634

Epoch 6/20

9/9 [=====] - 4s 463ms/step - loss: 1.0613 - accuracy: 0.5821 -  
balanced\_recall: 0.2311 - balanced\_precision: 0.5147 - balanced\_f1\_score: 0.3106 - val\_loss:  
1.2111 - val\_accuracy: 0.4571 - val\_balanced\_recall: 0.0540 - val\_balanced\_precision: 0.0938 -  
val\_balanced\_f1\_score: 0.0680

Epoch 7/20

9/9 [=====] - 13s 2s/step - loss: 1.0072 - accuracy: 0.5929 -  
balanced\_recall: 0.2578 - balanced\_precision: 0.6472 - balanced\_f1\_score: 0.3636 - val\_loss:  
1.1674 - val\_accuracy: 0.5000 - val\_balanced\_recall: 0.0470 - val\_balanced\_precision: 0.1083 -  
val\_balanced\_f1\_score: 0.0655

Epoch 8/20

9/9 [=====] - 16s 2s/step - loss: 0.9716 - accuracy: 0.6179 -  
balanced\_recall: 0.2710 - balanced\_precision: 0.6698 - balanced\_f1\_score: 0.3825 - val\_loss:  
1.1427 - val\_accuracy: 0.4857 - val\_balanced\_recall: 0.0956 - val\_balanced\_precision: 0.2778 -  
val\_balanced\_f1\_score: 0.1411

Epoch 9/20

9/9 [=====] - 11s 1s/step - loss: 0.9639 - accuracy: 0.6250 -  
balanced\_recall: 0.2694 - balanced\_precision: 0.6275 - balanced\_f1\_score: 0.3726 - val\_loss:  
1.1287 - val\_accuracy: 0.5000 - val\_balanced\_recall: 0.0876 - val\_balanced\_precision: 0.2068 -  
val\_balanced\_f1\_score: 0.1212

Epoch 10/20

9/9 [=====] - 4s 402ms/step - loss: 0.9363 - accuracy: 0.6214 -  
balanced\_recall: 0.3025 - balanced\_precision: 0.6365 - balanced\_f1\_score: 0.4026 - val\_loss:  
1.1322 - val\_accuracy: 0.5000 - val\_balanced\_recall: 0.1779 - val\_balanced\_precision: 0.3252 -  
val\_balanced\_f1\_score: 0.2283

Epoch 11/20

9/9 [=====] - 24s 3s/step - loss: 0.8979 - accuracy: 0.6607 -  
balanced\_recall: 0.3504 - balanced\_precision: 0.7043 - balanced\_f1\_score: 0.4565 - val\_loss:  
1.1164 - val\_accuracy: 0.5286 - val\_balanced\_recall: 0.2116 - val\_balanced\_precision: 0.4502 -  
val\_balanced\_f1\_score: 0.2876

Epoch 12/20

9/9 [=====] - 14s 2s/step - loss: 0.8860 - accuracy: 0.6607 -  
balanced\_recall: 0.3826 - balanced\_precision: 0.7788 - balanced\_f1\_score: 0.5093 - val\_loss:  
1.1099 - val\_accuracy: 0.5000 - val\_balanced\_recall: 0.1487 - val\_balanced\_precision: 0.3782 -  
val\_balanced\_f1\_score: 0.2120

Epoch 13/20

9/9 [=====] - 21s 3s/step - loss: 0.8373 - accuracy: 0.7250 -  
balanced\_recall: 0.4333 - balanced\_precision: 0.8212 - balanced\_f1\_score: 0.5648 - val\_loss:  
1.0904 - val\_accuracy: 0.5429 - val\_balanced\_recall: 0.2176 - val\_balanced\_precision: 0.4519 -  
val\_balanced\_f1\_score: 0.2935

Epoch 14/20

9/9 [=====] - 13s 2s/step - loss: 0.8372 - accuracy: 0.6857 -  
balanced\_recall: 0.4094 - balanced\_precision: 0.7870 - balanced\_f1\_score: 0.5354 - val\_loss:  
1.0829 - val\_accuracy: 0.5429 - val\_balanced\_recall: 0.2315 - val\_balanced\_precision: 0.4583 -  
val\_balanced\_f1\_score: 0.3062

Epoch 15/20

9/9 [=====] - 4s 460ms/step - loss: 0.8308 - accuracy: 0.7107 -  
balanced\_recall: 0.4609 - balanced\_precision: 0.8474 - balanced\_f1\_score: 0.5951 - val\_loss:  
1.0863 - val\_accuracy: 0.5571 - val\_balanced\_recall: 0.2379 - val\_balanced\_precision: 0.4510 -  
val\_balanced\_f1\_score: 0.3097

Epoch 16/20

9/9 [=====] - 23s 3s/step - loss: 0.8027 - accuracy: 0.7036 -  
balanced\_recall: 0.4451 - balanced\_precision: 0.8321 - balanced\_f1\_score: 0.5761 - val\_loss:  
1.0680 - val\_accuracy: 0.5000 - val\_balanced\_recall: 0.2526 - val\_balanced\_precision: 0.5208 -  
val\_balanced\_f1\_score: 0.3399

Epoch 17/20

9/9 [=====] - 4s 480ms/step - loss: 0.7911 - accuracy: 0.7250 -  
balanced\_recall: 0.4794 - balanced\_precision: 0.8157 - balanced\_f1\_score: 0.5988 - val\_loss:  
1.0712 - val\_accuracy: 0.5571 - val\_balanced\_recall: 0.2454 - val\_balanced\_precision: 0.4927 -  
val\_balanced\_f1\_score: 0.3271

Epoch 18/20

9/9 [=====] - 15s 2s/step - loss: 0.7756 - accuracy: 0.7107 -  
balanced\_recall: 0.4825 - balanced\_precision: 0.8730 - balanced\_f1\_score: 0.6184 - val\_loss:  
1.0653 - val\_accuracy: 0.5571 - val\_balanced\_recall: 0.2454 - val\_balanced\_precision: 0.4927 -  
val\_balanced\_f1\_score: 0.3271

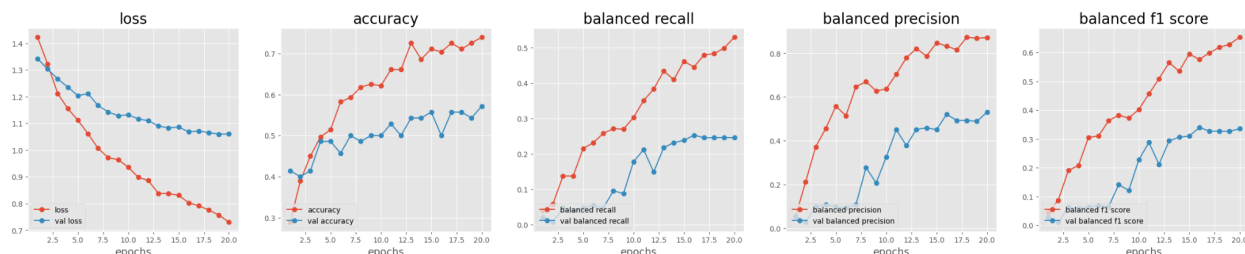
Epoch 19/20

9/9 [=====] - 25s 3s/step - loss: 0.7567 - accuracy: 0.7250 -  
balanced\_recall: 0.4987 - balanced\_precision: 0.8682 - balanced\_f1\_score: 0.6285 - val\_loss:

1.0598 - val\_accuracy: 0.5429 - val\_balanced\_recall: 0.2461 - val\_balanced\_precision: 0.4884 - val\_balanced\_f1\_score: 0.3265

Epoch 20/20

9/9 [=====] - 4s 405ms/step - loss: 0.7300 - accuracy: 0.7393 - balanced\_recall: 0.5291 - balanced\_precision: 0.8718 - balanced\_f1\_score: 0.6531 - val\_loss: 1.0603 - val\_accuracy: 0.5714 - val\_balanced\_recall: 0.2454 - val\_balanced\_precision: 0.5306 - val\_balanced\_f1\_score: 0.3355



## RUN #2

Epoch 1/20

9/9 [=====] - 43s 2s/step - loss: 1.3769 - accuracy: 0.2929 - balanced\_recall: 0.0608 - balanced\_precision: 0.1407 - balanced\_f1\_score: 0.0831 - val\_loss: 1.4190 - val\_accuracy: 0.3286 - val\_balanced\_recall: 0.0139 - val\_balanced\_precision: 0.0833 - val\_balanced\_f1\_score: 0.0238

Epoch 2/20

9/9 [=====] - 7s 858ms/step - loss: 1.2524 - accuracy: 0.3964 - balanced\_recall: 0.0739 - balanced\_precision: 0.2154 - balanced\_f1\_score: 0.1001 - val\_loss: 1.3173 - val\_accuracy: 0.3143 - val\_balanced\_recall: 0.0347 - val\_balanced\_precision: 0.0833 - val\_balanced\_f1\_score: 0.0490

Epoch 3/20

9/9 [=====] - 8s 921ms/step - loss: 1.2227 - accuracy: 0.4143 - balanced\_recall: 0.0676 - balanced\_precision: 0.2525 - balanced\_f1\_score: 0.1042 - val\_loss: 1.2814 - val\_accuracy: 0.4429 - val\_balanced\_recall: 0.0347 - val\_balanced\_precision: 0.0833 - val\_balanced\_f1\_score: 0.0490

Epoch 4/20

9/9 [=====] - 7s 845ms/step - loss: 1.1579 - accuracy: 0.4786 - balanced\_recall: 0.1196 - balanced\_precision: 0.3059 - balanced\_f1\_score: 0.1648 - val\_loss: 1.2636 - val\_accuracy: 0.4286 - val\_balanced\_recall: 0.1759 - val\_balanced\_precision: 0.2749 - val\_balanced\_f1\_score: 0.2133

Epoch 5/20

9/9 [=====] - 10s 1s/step - loss: 1.1155 - accuracy: 0.5143 - balanced\_recall: 0.1449 - balanced\_precision: 0.3767 - balanced\_f1\_score: 0.2051 - val\_loss:

1.1806 - val\_accuracy: 0.4857 - val\_balanced\_recall: 0.1505 - val\_balanced\_precision: 0.3056 - val\_balanced\_f1\_score: 0.2005

Epoch 6/20

9/9 [=====] - 9s 1s/step - loss: 1.0409 - accuracy: 0.5750 - balanced\_recall: 0.1444 - balanced\_precision: 0.4610 - balanced\_f1\_score: 0.2162 - val\_loss: 1.1709 - val\_accuracy: 0.5143 - val\_balanced\_recall: 0.2106 - val\_balanced\_precision: 0.3833 - val\_balanced\_f1\_score: 0.2715

Epoch 7/20

9/9 [=====] - 4s 492ms/step - loss: 1.0063 - accuracy: 0.5750 - balanced\_recall: 0.2330 - balanced\_precision: 0.5267 - balanced\_f1\_score: 0.3202 - val\_loss: 1.1715 - val\_accuracy: 0.4714 - val\_balanced\_recall: 0.2523 - val\_balanced\_precision: 0.2597 - val\_balanced\_f1\_score: 0.2474

Epoch 8/20

9/9 [=====] - 6s 737ms/step - loss: 0.9755 - accuracy: 0.5893 - balanced\_recall: 0.2381 - balanced\_precision: 0.5002 - balanced\_f1\_score: 0.3214 - val\_loss: 1.1278 - val\_accuracy: 0.5000 - val\_balanced\_recall: 0.2523 - val\_balanced\_precision: 0.2597 - val\_balanced\_f1\_score: 0.2474

Epoch 9/20

9/9 [=====] - 13s 2s/step - loss: 0.9539 - accuracy: 0.6643 - balanced\_recall: 0.2640 - balanced\_precision: 0.5508 - balanced\_f1\_score: 0.3548 - val\_loss: 1.1270 - val\_accuracy: 0.5714 - val\_balanced\_recall: 0.3056 - val\_balanced\_precision: 0.3963 - val\_balanced\_f1\_score: 0.3366

Epoch 10/20

9/9 [=====] - 7s 796ms/step - loss: 0.9061 - accuracy: 0.6571 - balanced\_recall: 0.2998 - balanced\_precision: 0.6932 - balanced\_f1\_score: 0.4167 - val\_loss: 1.1051 - val\_accuracy: 0.5286 - val\_balanced\_recall: 0.2801 - val\_balanced\_precision: 0.3361 - val\_balanced\_f1\_score: 0.3009

Epoch 11/20

9/9 [=====] - 7s 820ms/step - loss: 0.8890 - accuracy: 0.6536 - balanced\_recall: 0.3420 - balanced\_precision: 0.7740 - balanced\_f1\_score: 0.4717 - val\_loss: 1.0910 - val\_accuracy: 0.5143 - val\_balanced\_recall: 0.3125 - val\_balanced\_precision: 0.3052 - val\_balanced\_f1\_score: 0.3082

Epoch 12/20

9/9 [=====] - 6s 651ms/step - loss: 0.8629 - accuracy: 0.6643 - balanced\_recall: 0.3384 - balanced\_precision: 0.7640 - balanced\_f1\_score: 0.4664 - val\_loss: 1.0802 - val\_accuracy: 0.6000 - val\_balanced\_recall: 0.3148 - val\_balanced\_precision: 0.4236 - val\_balanced\_f1\_score: 0.3546

Epoch 13/20

9/9 [=====] - 4s 513ms/step - loss: 0.8623 - accuracy: 0.6571 - balanced\_recall: 0.3552 - balanced\_precision: 0.6564 - balanced\_f1\_score: 0.4584 - val\_loss: 1.0887 - val\_accuracy: 0.5571 - val\_balanced\_recall: 0.3634 - val\_balanced\_precision: 0.4251 - val\_balanced\_f1\_score: 0.3909

Epoch 14/20



9/9 [=====] - 7s 793ms/step - loss: 0.8136 - accuracy: 0.7071 -  
balanced\_recall: 0.4093 - balanced\_precision: 0.8333 - balanced\_f1\_score: 0.5452 - val\_loss:  
1.0603 - val\_accuracy: 0.5857 - val\_balanced\_recall: 0.3634 - val\_balanced\_precision: 0.4153 -  
val\_balanced\_f1\_score: 0.3862

Epoch 15/20

9/9 [=====] - 4s 485ms/step - loss: 0.8017 - accuracy: 0.7071 -  
balanced\_recall: 0.4989 - balanced\_precision: 0.8658 - balanced\_f1\_score: 0.6264 - val\_loss:  
1.0617 - val\_accuracy: 0.5857 - val\_balanced\_recall: 0.3634 - val\_balanced\_precision: 0.4904 -  
val\_balanced\_f1\_score: 0.4061

Epoch 16/20

9/9 [=====] - 4s 442ms/step - loss: 0.7990 - accuracy: 0.6929 -  
balanced\_recall: 0.4655 - balanced\_precision: 0.8287 - balanced\_f1\_score: 0.5935 - val\_loss:  
1.0649 - val\_accuracy: 0.5857 - val\_balanced\_recall: 0.4144 - val\_balanced\_precision: 0.4819 -  
val\_balanced\_f1\_score: 0.4394

Epoch 17/20

9/9 [=====] - 9s 1s/step - loss: 0.7790 - accuracy: 0.7107 -  
balanced\_recall: 0.4541 - balanced\_precision: 0.7819 - balanced\_f1\_score: 0.5729 - val\_loss:  
1.0636 - val\_accuracy: 0.5857 - val\_balanced\_recall: 0.4560 - val\_balanced\_precision: 0.4819 -  
val\_balanced\_f1\_score: 0.4667

RUN #3

Epoch 1/20

9/9 [=====] - 53s 2s/step - loss: 1.4161 - accuracy: 0.3036 -  
balanced\_recall: 0.0536 - balanced\_precision: 0.1769 - balanced\_f1\_score: 0.0739 - val\_loss:  
1.4423 - val\_accuracy: 0.2857 - val\_balanced\_recall: 0.0514 - val\_balanced\_precision: 0.0532 -  
val\_balanced\_f1\_score: 0.0523

Epoch 2/20

9/9 [=====] - 10s 1s/step - loss: 1.3627 - accuracy: 0.3321 -  
balanced\_recall: 0.1051 - balanced\_precision: 0.1101 - balanced\_f1\_score: 0.1051 - val\_loss:  
1.3869 - val\_accuracy: 0.3571 - val\_balanced\_recall: 0.0514 - val\_balanced\_precision: 0.0694 -  
val\_balanced\_f1\_score: 0.0587

Epoch 3/20

9/9 [=====] - 7s 865ms/step - loss: 1.2676 - accuracy: 0.3893 -  
balanced\_recall: 0.0695 - balanced\_precision: 0.2370 - balanced\_f1\_score: 0.1027 - val\_loss:  
1.2795 - val\_accuracy: 0.3857 - val\_balanced\_recall: 0.1194 - val\_balanced\_precision: 0.1708 -  
val\_balanced\_f1\_score: 0.1345

Epoch 4/20

9/9 [=====] - 7s 862ms/step - loss: 1.2132 - accuracy: 0.4429 -  
balanced\_recall: 0.1010 - balanced\_precision: 0.2163 - balanced\_f1\_score: 0.1289 - val\_loss:  
1.2407 - val\_accuracy: 0.3857 - val\_balanced\_recall: 0.0597 - val\_balanced\_precision: 0.0938 -  
val\_balanced\_f1\_score: 0.0729

Epoch 5/20

9/9 [=====] - 6s 731ms/step - loss: 1.2033 - accuracy: 0.4107 -  
balanced\_recall: 0.1174 - balanced\_precision: 0.2807 - balanced\_f1\_score: 0.1590 - val\_loss:  
1.1902 - val\_accuracy: 0.4000 - val\_balanced\_recall: 0.1500 - val\_balanced\_precision: 0.1958 -  
val\_balanced\_f1\_score: 0.1667

Epoch 6/20

9/9 [=====] - 7s 774ms/step - loss: 1.1100 - accuracy: 0.5393 -  
balanced\_recall: 0.1588 - balanced\_precision: 0.3805 - balanced\_f1\_score: 0.2197 - val\_loss:  
1.1614 - val\_accuracy: 0.4143 - val\_balanced\_recall: 0.1653 - val\_balanced\_precision: 0.1893 -  
val\_balanced\_f1\_score: 0.1756

Epoch 7/20

9/9 [=====] - 7s 811ms/step - loss: 1.0716 - accuracy: 0.5179 -  
balanced\_recall: 0.1666 - balanced\_precision: 0.4235 - balanced\_f1\_score: 0.2297 - val\_loss:  
1.1333 - val\_accuracy: 0.4429 - val\_balanced\_recall: 0.1806 - val\_balanced\_precision: 0.1806 -  
val\_balanced\_f1\_score: 0.1806

Epoch 8/20

9/9 [=====] - 8s 917ms/step - loss: 1.0374 - accuracy: 0.5714 -  
balanced\_recall: 0.2037 - balanced\_precision: 0.4867 - balanced\_f1\_score: 0.2840 - val\_loss:  
1.0982 - val\_accuracy: 0.4571 - val\_balanced\_recall: 0.1806 - val\_balanced\_precision: 0.1984 -  
val\_balanced\_f1\_score: 0.1879

Epoch 9/20

9/9 [=====] - 7s 803ms/step - loss: 0.9832 - accuracy: 0.6143 -  
balanced\_recall: 0.2384 - balanced\_precision: 0.5967 - balanced\_f1\_score: 0.3336 - val\_loss:  
1.0811 - val\_accuracy: 0.4429 - val\_balanced\_recall: 0.1889 - val\_balanced\_precision: 0.1944 -  
val\_balanced\_f1\_score: 0.1915

Epoch 10/20

9/9 [=====] - 6s 649ms/step - loss: 0.9678 - accuracy: 0.6250 -  
balanced\_recall: 0.2507 - balanced\_precision: 0.6256 - balanced\_f1\_score: 0.3533 - val\_loss:  
1.0560 - val\_accuracy: 0.5000 - val\_balanced\_recall: 0.1889 - val\_balanced\_precision: 0.1843 -  
val\_balanced\_f1\_score: 0.1865

Epoch 11/20

9/9 [=====] - 7s 765ms/step - loss: 0.9313 - accuracy: 0.6500 -  
balanced\_recall: 0.2750 - balanced\_precision: 0.6356 - balanced\_f1\_score: 0.3776 - val\_loss:  
1.0313 - val\_accuracy: 0.5286 - val\_balanced\_recall: 0.2167 - val\_balanced\_precision: 0.2847 -  
val\_balanced\_f1\_score: 0.2444

Epoch 12/20

9/9 [=====] - 6s 698ms/step - loss: 0.9344 - accuracy: 0.6143 -  
balanced\_recall: 0.3008 - balanced\_precision: 0.6662 - balanced\_f1\_score: 0.4081 - val\_loss:  
1.0152 - val\_accuracy: 0.5429 - val\_balanced\_recall: 0.2329 - val\_balanced\_precision: 0.3285 -  
val\_balanced\_f1\_score: 0.2689

Epoch 13/20

9/9 [=====] - 6s 657ms/step - loss: 0.9117 - accuracy: 0.6429 -  
balanced\_recall: 0.3263 - balanced\_precision: 0.7152 - balanced\_f1\_score: 0.4461 - val\_loss:  
1.0088 - val\_accuracy: 0.5286 - val\_balanced\_recall: 0.2459 - val\_balanced\_precision: 0.3591 -  
val\_balanced\_f1\_score: 0.2914

Epoch 14/20

9/9 [=====] - 7s 804ms/step - loss: 0.8627 - accuracy: 0.6857 -  
balanced\_recall: 0.3939 - balanced\_precision: 0.7861 - balanced\_f1\_score: 0.5204 - val\_loss:  
0.9869 - val\_accuracy: 0.5857 - val\_balanced\_recall: 0.2459 - val\_balanced\_precision: 0.3661 -  
val\_balanced\_f1\_score: 0.2934

Epoch 15/20

9/9 [=====] - 6s 745ms/step - loss: 0.8747 - accuracy: 0.6500 -  
balanced\_recall: 0.3632 - balanced\_precision: 0.7272 - balanced\_f1\_score: 0.4814 - val\_loss:  
0.9709 - val\_accuracy: 0.5571 - val\_balanced\_recall: 0.2552 - val\_balanced\_precision: 0.4119 -  
val\_balanced\_f1\_score: 0.3127

Epoch 16/20

9/9 [=====] - 4s 492ms/step - loss: 0.8479 - accuracy: 0.6607 -  
balanced\_recall: 0.3979 - balanced\_precision: 0.7848 - balanced\_f1\_score: 0.5244 - val\_loss:  
0.9713 - val\_accuracy: 0.5714 - val\_balanced\_recall: 0.2459 - val\_balanced\_precision: 0.3536 -  
val\_balanced\_f1\_score: 0.2897

Epoch 17/20

9/9 [=====] - 7s 819ms/step - loss: 0.8396 - accuracy: 0.6893 -  
balanced\_recall: 0.4201 - balanced\_precision: 0.7919 - balanced\_f1\_score: 0.5441 - val\_loss:  
0.9520 - val\_accuracy: 0.5429 - val\_balanced\_recall: 0.2563 - val\_balanced\_precision: 0.3841 -  
val\_balanced\_f1\_score: 0.3070

Epoch 18/20

9/9 [=====] - 6s 655ms/step - loss: 0.8167 - accuracy: 0.7071 -  
balanced\_recall: 0.4218 - balanced\_precision: 0.8239 - balanced\_f1\_score: 0.5548 - val\_loss:  
0.9478 - val\_accuracy: 0.5571 - val\_balanced\_recall: 0.2459 - val\_balanced\_precision: 0.3702 -  
val\_balanced\_f1\_score: 0.2949

Epoch 19/20

9/9 [=====] - 6s 671ms/step - loss: 0.7983 - accuracy: 0.6929 -  
balanced\_recall: 0.4676 - balanced\_precision: 0.8686 - balanced\_f1\_score: 0.6025 - val\_loss:  
0.9387 - val\_accuracy: 0.5714 - val\_balanced\_recall: 0.2459 - val\_balanced\_precision: 0.3702 -  
val\_balanced\_f1\_score: 0.2949

Epoch 20/20

9/9 [=====] - 7s 787ms/step - loss: 0.7930 - accuracy: 0.6821 -  
balanced\_recall: 0.4448 - balanced\_precision: 0.8019 - balanced\_f1\_score: 0.5694 - val\_loss:  
0.9342 - val\_accuracy: 0.5714 - val\_balanced\_recall: 0.2821 - val\_balanced\_precision: 0.4716 -  
val\_balanced\_f1\_score: 0.3505

RUN #4

Epoch 1/20

9/9 [=====] - 36s 2s/step - loss: 1.3397 - accuracy: 0.3214 -  
balanced\_recall: 0.0796 - balanced\_precision: 0.2272 - balanced\_f1\_score: 0.1136 - val\_loss:  
1.3303 - val\_accuracy: 0.3714 - val\_balanced\_recall: 0.0406 - val\_balanced\_precision: 0.1875 -  
val\_balanced\_f1\_score: 0.0634

Epoch 2/20

9/9 [=====] - 8s 911ms/step - loss: 1.2899 - accuracy: 0.3714 -  
balanced\_recall: 0.0650 - balanced\_precision: 0.2250 - balanced\_f1\_score: 0.0961 - val\_loss:  
1.2748 - val\_accuracy: 0.4143 - val\_balanced\_recall: 0.0470 - val\_balanced\_precision: 0.1833 -  
val\_balanced\_f1\_score: 0.0731

Epoch 3/20

9/9 [=====] - 7s 796ms/step - loss: 1.1812 - accuracy: 0.4679 -  
balanced\_recall: 0.1120 - balanced\_precision: 0.2618 - balanced\_f1\_score: 0.1528 - val\_loss:  
1.2439 - val\_accuracy: 0.4429 - val\_balanced\_recall: 0.0598 - val\_balanced\_precision: 0.2083 -  
val\_balanced\_f1\_score: 0.0902

Epoch 4/20

9/9 [=====] - 6s 719ms/step - loss: 1.1423 - accuracy: 0.5179 -  
balanced\_recall: 0.1498 - balanced\_precision: 0.4030 - balanced\_f1\_score: 0.2115 - val\_loss:  
1.1955 - val\_accuracy: 0.4714 - val\_balanced\_recall: 0.0598 - val\_balanced\_precision: 0.2083 -  
val\_balanced\_f1\_score: 0.0902

Epoch 5/20

9/9 [=====] - 7s 826ms/step - loss: 1.0770 - accuracy: 0.5536 -  
balanced\_recall: 0.1637 - balanced\_precision: 0.5048 - balanced\_f1\_score: 0.2433 - val\_loss:  
1.1835 - val\_accuracy: 0.4714 - val\_balanced\_recall: 0.1197 - val\_balanced\_precision: 0.2222 -  
val\_balanced\_f1\_score: 0.1513

Epoch 6/20

9/9 [=====] - 4s 413ms/step - loss: 1.0565 - accuracy: 0.5607 -  
balanced\_recall: 0.1938 - balanced\_precision: 0.4924 - balanced\_f1\_score: 0.2762 - val\_loss:  
1.1908 - val\_accuracy: 0.4714 - val\_balanced\_recall: 0.1261 - val\_balanced\_precision: 0.2222 -  
val\_balanced\_f1\_score: 0.1584

Epoch 7/20

9/9 [=====] - 6s 749ms/step - loss: 1.0203 - accuracy: 0.5821 -  
balanced\_recall: 0.2241 - balanced\_precision: 0.5192 - balanced\_f1\_score: 0.3098 - val\_loss:  
1.1510 - val\_accuracy: 0.5143 - val\_balanced\_recall: 0.1207 - val\_balanced\_precision: 0.2976 -  
val\_balanced\_f1\_score: 0.1639

Epoch 8/20

9/9 [=====] - 8s 919ms/step - loss: 0.9947 - accuracy: 0.6107 -  
balanced\_recall: 0.2300 - balanced\_precision: 0.5461 - balanced\_f1\_score: 0.3163 - val\_loss:  
1.1355 - val\_accuracy: 0.5429 - val\_balanced\_recall: 0.1335 - val\_balanced\_precision: 0.2778 -  
val\_balanced\_f1\_score: 0.1737

Epoch 9/20

9/9 [=====] - 6s 746ms/step - loss: 0.9364 - accuracy: 0.6250 -  
balanced\_recall: 0.3347 - balanced\_precision: 0.7163 - balanced\_f1\_score: 0.4528 - val\_loss:  
1.1234 - val\_accuracy: 0.5143 - val\_balanced\_recall: 0.1528 - val\_balanced\_precision: 0.2405 -  
val\_balanced\_f1\_score: 0.1850

Epoch 10/20

9/9 [=====] - 4s 487ms/step - loss: 0.9085 - accuracy: 0.6500 -  
balanced\_recall: 0.3526 - balanced\_precision: 0.8061 - balanced\_f1\_score: 0.4871 - val\_loss:  
1.1303 - val\_accuracy: 0.4857 - val\_balanced\_recall: 0.1835 - val\_balanced\_precision: 0.3611 -  
val\_balanced\_f1\_score: 0.2416

Epoch 11/20

9/9 [=====] - 4s 473ms/step - loss: 0.8805 - accuracy: 0.6536 -  
balanced\_recall: 0.3577 - balanced\_precision: 0.6447 - balanced\_f1\_score: 0.4555 - val\_loss:  
1.1240 - val\_accuracy: 0.4857 - val\_balanced\_recall: 0.2028 - val\_balanced\_precision: 0.3655 -  
val\_balanced\_f1\_score: 0.2601

Epoch 12/20

9/9 [=====] - 6s 714ms/step - loss: 0.8648 - accuracy: 0.6929 -  
balanced\_recall: 0.3610 - balanced\_precision: 0.7554 - balanced\_f1\_score: 0.4837 - val\_loss:  
1.1006 - val\_accuracy: 0.5286 - val\_balanced\_recall: 0.1803 - val\_balanced\_precision: 0.3306 -  
val\_balanced\_f1\_score: 0.2315

Epoch 13/20

9/9 [=====] - 4s 477ms/step - loss: 0.8540 - accuracy: 0.7107 -  
balanced\_recall: 0.3833 - balanced\_precision: 0.7167 - balanced\_f1\_score: 0.4945 - val\_loss:  
1.1237 - val\_accuracy: 0.4857 - val\_balanced\_recall: 0.1940 - val\_balanced\_precision: 0.3889 -  
val\_balanced\_f1\_score: 0.2557

Epoch 14/20

9/9 [=====] - 5s 533ms/step - loss: 0.8059 - accuracy: 0.7143 -  
balanced\_recall: 0.4479 - balanced\_precision: 0.8110 - balanced\_f1\_score: 0.5755 - val\_loss:  
1.1116 - val\_accuracy: 0.5000 - val\_balanced\_recall: 0.1675 - val\_balanced\_precision: 0.3250 -  
val\_balanced\_f1\_score: 0.2180

Epoch 15/20

9/9 [=====] - 8s 897ms/step - loss: 0.8084 - accuracy: 0.7107 -  
balanced\_recall: 0.4656 - balanced\_precision: 0.8485 - balanced\_f1\_score: 0.5955 - val\_loss:  
1.1093 - val\_accuracy: 0.5143 - val\_balanced\_recall: 0.2653 - val\_balanced\_precision: 0.4403 -  
val\_balanced\_f1\_score: 0.3230

RUN #5

Epoch 1/20

9/9 [=====] - 37s 2s/step - loss: 1.4179 - accuracy: 0.3321 -  
balanced\_recall: 0.0554 - balanced\_precision: 0.1063 - balanced\_f1\_score: 0.0666 - val\_loss:  
1.3338 - val\_accuracy: 0.3571 - val\_balanced\_recall: 0.0179 - val\_balanced\_precision: 0.0833 -  
val\_balanced\_f1\_score: 0.0294

Epoch 2/20

9/9 [=====] - 7s 792ms/step - loss: 1.3446 - accuracy: 0.3607 -  
balanced\_recall: 0.0456 - balanced\_precision: 0.2060 - balanced\_f1\_score: 0.0735 - val\_loss:  
1.2617 - val\_accuracy: 0.3571 - val\_balanced\_recall: 0.0238 - val\_balanced\_precision: 0.0667 -  
val\_balanced\_f1\_score: 0.0351

Epoch 3/20

9/9 [=====] - 7s 770ms/step - loss: 1.1994 - accuracy: 0.4679 -  
balanced\_recall: 0.1087 - balanced\_precision: 0.2654 - balanced\_f1\_score: 0.1503 - val\_loss:  
1.2491 - val\_accuracy: 0.4286 - val\_balanced\_recall: 0.0571 - val\_balanced\_precision: 0.1528 -  
val\_balanced\_f1\_score: 0.0830

Epoch 4/20

9/9 [=====] - 7s 793ms/step - loss: 1.1812 - accuracy: 0.4893 -  
balanced\_recall: 0.1067 - balanced\_precision: 0.2564 - balanced\_f1\_score: 0.1446 - val\_loss:  
1.2022 - val\_accuracy: 0.4714 - val\_balanced\_recall: 0.0595 - val\_balanced\_precision: 0.1472 -  
val\_balanced\_f1\_score: 0.0846

Epoch 5/20

9/9 [=====] - 6s 742ms/step - loss: 1.1173 - accuracy: 0.5357 -  
balanced\_recall: 0.1381 - balanced\_precision: 0.3906 - balanced\_f1\_score: 0.2000 - val\_loss:  
1.1677 - val\_accuracy: 0.4857 - val\_balanced\_recall: 0.0902 - val\_balanced\_precision: 0.2123 -  
val\_balanced\_f1\_score: 0.1263

Epoch 6/20

9/9 [=====] - 7s 812ms/step - loss: 1.0488 - accuracy: 0.5750 -  
balanced\_recall: 0.1792 - balanced\_precision: 0.4602 - balanced\_f1\_score: 0.2522 - val\_loss:  
1.1452 - val\_accuracy: 0.5000 - val\_balanced\_recall: 0.1385 - val\_balanced\_precision: 0.2315 -  
val\_balanced\_f1\_score: 0.1685

Epoch 7/20

9/9 [=====] - 6s 681ms/step - loss: 1.0273 - accuracy: 0.6143 -  
balanced\_recall: 0.2369 - balanced\_precision: 0.5569 - balanced\_f1\_score: 0.3213 - val\_loss:  
1.1249 - val\_accuracy: 0.5143 - val\_balanced\_recall: 0.1582 - val\_balanced\_precision: 0.3708 -  
val\_balanced\_f1\_score: 0.2217

Epoch 8/20

9/9 [=====] - 6s 671ms/step - loss: 0.9822 - accuracy: 0.6179 -  
balanced\_recall: 0.2922 - balanced\_precision: 0.6921 - balanced\_f1\_score: 0.4063 - val\_loss:  
1.1186 - val\_accuracy: 0.5286 - val\_balanced\_recall: 0.1582 - val\_balanced\_precision: 0.3417 -  
val\_balanced\_f1\_score: 0.2162

Epoch 9/20

9/9 [=====] - 7s 817ms/step - loss: 0.9602 - accuracy: 0.6179 -  
balanced\_recall: 0.2811 - balanced\_precision: 0.6198 - balanced\_f1\_score: 0.3834 - val\_loss:  
1.1028 - val\_accuracy: 0.5429 - val\_balanced\_recall: 0.1725 - val\_balanced\_precision: 0.3504 -  
val\_balanced\_f1\_score: 0.2311

Epoch 10/20

9/9 [=====] - 6s 688ms/step - loss: 0.9181 - accuracy: 0.6607 -  
balanced\_recall: 0.3376 - balanced\_precision: 0.7378 - balanced\_f1\_score: 0.4572 - val\_loss:  
1.0788 - val\_accuracy: 0.5571 - val\_balanced\_recall: 0.2249 - val\_balanced\_precision: 0.3988 -  
val\_balanced\_f1\_score: 0.2853

Epoch 11/20

9/9 [=====] - 4s 483ms/step - loss: 0.9083 - accuracy: 0.7036 -  
balanced\_recall: 0.3232 - balanced\_precision: 0.7305 - balanced\_f1\_score: 0.4453 - val\_loss:  
1.0870 - val\_accuracy: 0.5429 - val\_balanced\_recall: 0.1972 - val\_balanced\_precision: 0.3710 -  
val\_balanced\_f1\_score: 0.2575

Epoch 12/20

9/9 [=====] - 5s 523ms/step - loss: 0.8845 - accuracy: 0.6643 -  
balanced\_recall: 0.3556 - balanced\_precision: 0.6601 - balanced\_f1\_score: 0.4574 - val\_loss:  
1.0829 - val\_accuracy: 0.5429 - val\_balanced\_recall: 0.2371 - val\_balanced\_precision: 0.3833 -  
val\_balanced\_f1\_score: 0.2912

Epoch 13/20

9/9 [=====] - 6s 719ms/step - loss: 0.8450 - accuracy: 0.7107 -  
balanced\_recall: 0.4090 - balanced\_precision: 0.8483 - balanced\_f1\_score: 0.5493 - val\_loss:  
1.0707 - val\_accuracy: 0.5857 - val\_balanced\_recall: 0.2398 - val\_balanced\_precision: 0.4465 -  
val\_balanced\_f1\_score: 0.3090

Epoch 14/20

9/9 [=====] - 4s 408ms/step - loss: 0.8409 - accuracy: 0.6857 -  
balanced\_recall: 0.4051 - balanced\_precision: 0.7528 - balanced\_f1\_score: 0.5242 - val\_loss:  
1.0732 - val\_accuracy: 0.5571 - val\_balanced\_recall: 0.2823 - val\_balanced\_precision: 0.4433 -  
val\_balanced\_f1\_score: 0.3434

Epoch 15/20

9/9 [=====] - 6s 762ms/step - loss: 0.8332 - accuracy: 0.6857 -  
balanced\_recall: 0.4031 - balanced\_precision: 0.7796 - balanced\_f1\_score: 0.5285 - val\_loss:  
1.0572 - val\_accuracy: 0.5429 - val\_balanced\_recall: 0.2476 - val\_balanced\_precision: 0.3972 -  
val\_balanced\_f1\_score: 0.3032

Epoch 16/20

9/9 [=====] - 4s 416ms/step - loss: 0.8105 - accuracy: 0.7107 -  
balanced\_recall: 0.4577 - balanced\_precision: 0.8474 - balanced\_f1\_score: 0.5867 - val\_loss:  
1.0636 - val\_accuracy: 0.5714 - val\_balanced\_recall: 0.2753 - val\_balanced\_precision: 0.4016 -  
val\_balanced\_f1\_score: 0.3249

Epoch 17/20

9/9 [=====] - 7s 774ms/step - loss: 0.7991 - accuracy: 0.7286 -  
balanced\_recall: 0.4593 - balanced\_precision: 0.8387 - balanced\_f1\_score: 0.5899 - val\_loss:  
1.0516 - val\_accuracy: 0.5857 - val\_balanced\_recall: 0.2992 - val\_balanced\_precision: 0.4578 -  
val\_balanced\_f1\_score: 0.3605

Epoch 18/20

9/9 [=====] - 6s 759ms/step - loss: 0.7682 - accuracy: 0.7286 -  
balanced\_recall: 0.4870 - balanced\_precision: 0.8695 - balanced\_f1\_score: 0.6189 - val\_loss:  
1.0480 - val\_accuracy: 0.5571 - val\_balanced\_recall: 0.2996 - val\_balanced\_precision: 0.4480 -  
val\_balanced\_f1\_score: 0.3578

Epoch 19/20

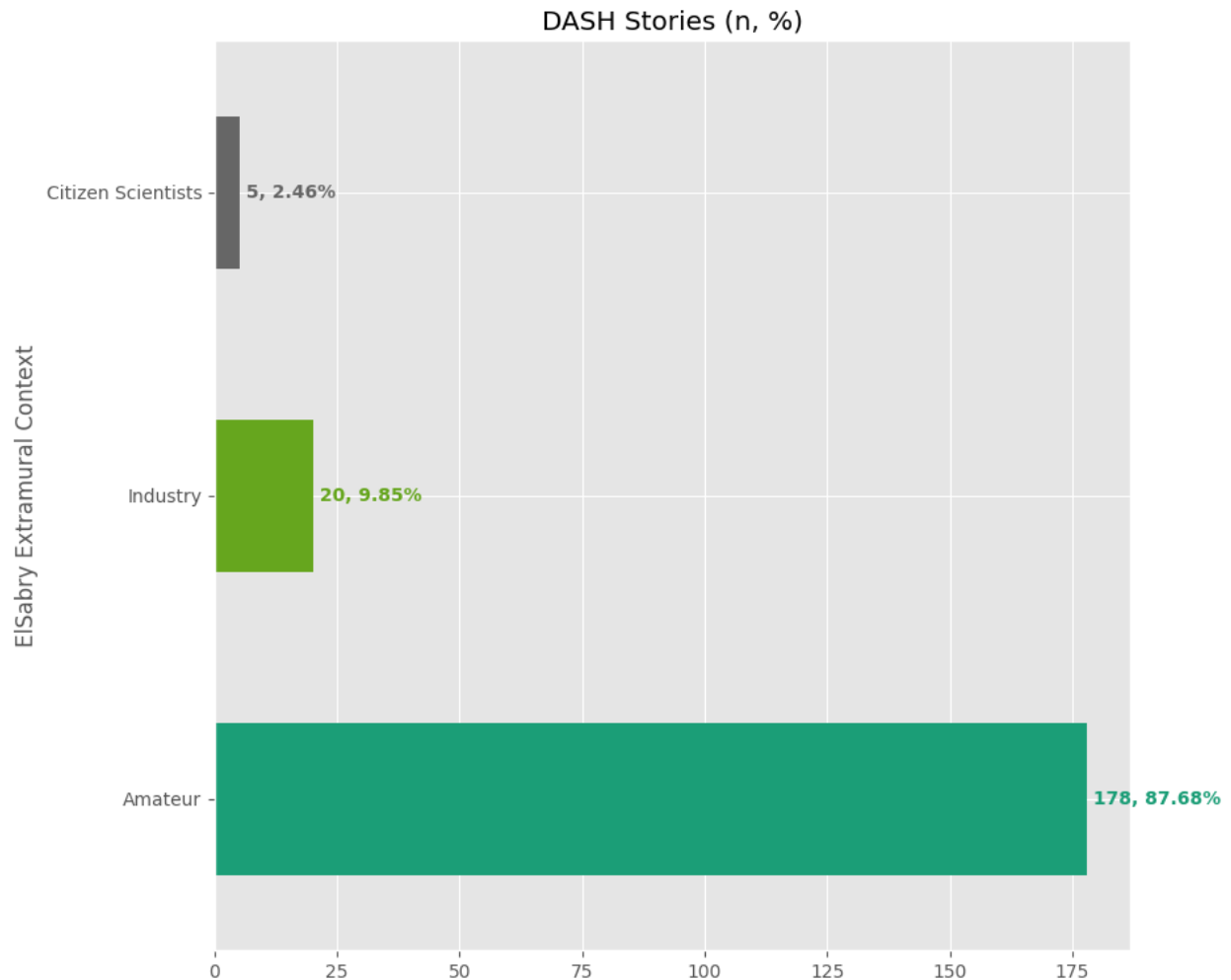
9/9 [=====] - 4s 490ms/step - loss: 0.7471 - accuracy: 0.7250 -  
balanced\_recall: 0.4961 - balanced\_precision: 0.8556 - balanced\_f1\_score: 0.6241 - val\_loss:  
1.0486 - val\_accuracy: 0.5571 - val\_balanced\_recall: 0.2996 - val\_balanced\_precision: 0.4480 -  
val\_balanced\_f1\_score: 0.3578

Epoch 20/20

9/9 [=====] - 4s 481ms/step - loss: 0.7373 - accuracy: 0.7393 -  
balanced\_recall: 0.5243 - balanced\_precision: 0.8680 - balanced\_f1\_score: 0.6496 - val\_loss:  
1.0490 - val\_accuracy: 0.5714 - val\_balanced\_recall: 0.3274 - val\_balanced\_precision: 0.4989 -  
val\_balanced\_f1\_score: 0.3940

## EISabry Extramural Categories 7/16/2023

### 5 Fold Cross-Validation



### RUN #1

poch 1/20

6/6 [=====] - 35s 2s/step - loss: 0.8410 - accuracy: 0.6296 -  
balanced\_recall: 0.1870 - balanced\_precision: 0.3061 - balanced\_f1\_score: 0.2173 - val\_loss:  
0.6803 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2517 -  
val\_balanced\_f1\_score: 0.2859

Epoch 2/20

6/6 [=====] - 2s 349ms/step - loss: 0.4764 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.2778 - balanced\_f1\_score: 0.3002 - val\_loss:  
0.6864 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2517 -  
val\_balanced\_f1\_score: 0.2859



Epoch 3/20

6/6 [=====] - 2s 394ms/step - loss: 0.4162 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3038 - balanced\_f1\_score: 0.3176 - val\_loss:  
0.6973 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2517 -  
val\_balanced\_f1\_score: 0.2859

Epoch 4/20

6/6 [=====] - 10s 2s/step - loss: 0.3585 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.2778 - balanced\_f1\_score: 0.2999 - val\_loss:  
0.6863 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2517 -  
val\_balanced\_f1\_score: 0.2859

RUN #2

Epoch 1/20

6/6 [=====] - 37s 2s/step - loss: 0.4857 - accuracy: 0.8889 -  
balanced\_recall: 0.3259 - balanced\_precision: 0.2773 - balanced\_f1\_score: 0.2960 - val\_loss:  
0.6956 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 2/20

6/6 [=====] - 6s 1s/step - loss: 0.3940 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3038 - balanced\_f1\_score: 0.3175 - val\_loss:  
0.6611 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 3/20

6/6 [=====] - 7s 1s/step - loss: 0.3871 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3038 - balanced\_f1\_score: 0.3176 - val\_loss:  
0.6268 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 4/20

6/6 [=====] - 6s 1s/step - loss: 0.3695 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3038 - balanced\_f1\_score: 0.3176 - val\_loss:  
0.5976 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 5/20

6/6 [=====] - 11s 2s/step - loss: 0.3493 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3038 - balanced\_f1\_score: 0.3175 - val\_loss:  
0.5871 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 6/20

6/6 [=====] - 6s 1s/step - loss: 0.3377 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3038 - balanced\_f1\_score: 0.3177 - val\_loss:  
0.5805 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 7/20

6/6 [=====] - 6s 1s/step - loss: 0.3081 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3038 - balanced\_f1\_score: 0.3174 - val\_loss:  
0.5680 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 8/20

6/6 [=====] - 3s 423ms/step - loss: 0.3268 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3038 - balanced\_f1\_score: 0.3176 - val\_loss:  
0.5706 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 9/20

6/6 [=====] - 3s 459ms/step - loss: 0.3122 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3038 - balanced\_f1\_score: 0.3176 - val\_loss:  
0.5707 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 10/20

6/6 [=====] - 5s 917ms/step - loss: 0.2925 - accuracy: 0.9012 -  
balanced\_recall: 0.3611 - balanced\_precision: 0.3611 - balanced\_f1\_score: 0.3584 - val\_loss:  
0.5633 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 11/20

6/6 [=====] - 8s 2s/step - loss: 0.2905 - accuracy: 0.8951 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3038 - balanced\_f1\_score: 0.3177 - val\_loss:  
0.5602 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 12/20

6/6 [=====] - 5s 950ms/step - loss: 0.2522 - accuracy: 0.9012 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.2794 - balanced\_f1\_score: 0.3010 - val\_loss:  
0.5469 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 13/20

6/6 [=====] - 7s 1s/step - loss: 0.2559 - accuracy: 0.9074 -  
balanced\_recall: 0.3750 - balanced\_precision: 0.4180 - balanced\_f1\_score: 0.3919 - val\_loss:  
0.5041 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 14/20

6/6 [=====] - 5s 862ms/step - loss: 0.2623 - accuracy: 0.9136 -  
balanced\_recall: 0.3750 - balanced\_precision: 0.4196 - balanced\_f1\_score: 0.3924 - val\_loss:  
0.4982 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 15/20

6/6 [=====] - 3s 446ms/step - loss: 0.2410 - accuracy: 0.9074 -  
balanced\_recall: 0.3704 - balanced\_precision: 0.4196 - balanced\_f1\_score: 0.3894 - val\_loss:  
0.5195 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 16/20

6/6 [=====] - 3s 430ms/step - loss: 0.2430 - accuracy: 0.9012 -  
balanced\_recall: 0.3611 - balanced\_precision: 0.3382 - balanced\_f1\_score: 0.3430 - val\_loss:  
0.5133 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 17/20

6/6 [=====] - 6s 1s/step - loss: 0.2175 - accuracy: 0.9074 -  
balanced\_recall: 0.3499 - balanced\_precision: 0.3397 - balanced\_f1\_score: 0.3364 - val\_loss:  
0.4519 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 18/20

6/6 [=====] - 5s 868ms/step - loss: 0.2175 - accuracy: 0.9198 -  
balanced\_recall: 0.4072 - balanced\_precision: 0.4817 - balanced\_f1\_score: 0.4373 - val\_loss:  
0.4173 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 19/20

6/6 [=====] - 2s 412ms/step - loss: 0.2236 - accuracy: 0.9383 -  
balanced\_recall: 0.4769 - balanced\_precision: 0.5391 - balanced\_f1\_score: 0.5032 - val\_loss:  
0.4321 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

Epoch 20/20

6/6 [=====] - 3s 430ms/step - loss: 0.2082 - accuracy: 0.9198 -  
balanced\_recall: 0.4074 - balanced\_precision: 0.4769 - balanced\_f1\_score: 0.4356 - val\_loss:  
0.4679 - val\_accuracy: 0.8049 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2784 -  
val\_balanced\_f1\_score: 0.3031

RUN #3

Epoch 1/20

6/6 [=====] - 30s 2s/step - loss: 0.6110 - accuracy: 0.8642 -  
balanced\_recall: 0.3008 - balanced\_precision: 0.2816 - balanced\_f1\_score: 0.2837 - val\_loss:  
0.5718 - val\_accuracy: 0.8293 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2969 -  
val\_balanced\_f1\_score: 0.3129

Epoch 2/20

6/6 [=====] - 2s 409ms/step - loss: 0.4398 - accuracy: 0.8889 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3021 - balanced\_f1\_score: 0.3167 - val\_loss:  
0.5948 - val\_accuracy: 0.8293 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2969 -  
val\_balanced\_f1\_score: 0.3129

Epoch 3/20

6/6 [=====] - 2s 395ms/step - loss: 0.4232 - accuracy: 0.8889 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3021 - balanced\_f1\_score: 0.3160 - val\_loss:  
0.6142 - val\_accuracy: 0.8293 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2969 -  
val\_balanced\_f1\_score: 0.3129

Epoch 4/20

6/6 [=====] - 6s 1s/step - loss: 0.4238 - accuracy: 0.8889 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.2760 - balanced\_f1\_score: 0.2991 - val\_loss:  
0.5877 - val\_accuracy: 0.8293 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2969 -  
val\_balanced\_f1\_score: 0.3129

#### RUN #4

Epoch 1/20

6/6 [=====] - 48s 2s/step - loss: 1.1350 - accuracy: 0.4012 -  
balanced\_recall: 0.1247 - balanced\_precision: 0.2376 - balanced\_f1\_score: 0.1491 - val\_loss:  
0.5468 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3148 - val\_balanced\_precision: 0.3118 -  
val\_balanced\_f1\_score: 0.3120

Epoch 2/20

6/6 [=====] - 5s 927ms/step - loss: 0.4870 - accuracy: 0.8765 -  
balanced\_recall: 0.3271 - balanced\_precision: 0.2992 - balanced\_f1\_score: 0.3124 - val\_loss:  
0.4345 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.3073 -  
val\_balanced\_f1\_score: 0.3192

Epoch 3/20

6/6 [=====] - 3s 456ms/step - loss: 0.4466 - accuracy: 0.8765 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.2986 - balanced\_f1\_score: 0.3147 - val\_loss:  
0.4655 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.3073 -  
val\_balanced\_f1\_score: 0.3192

Epoch 4/20

6/6 [=====] - 2s 400ms/step - loss: 0.4672 - accuracy: 0.8765 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.2986 - balanced\_f1\_score: 0.3146 - val\_loss:  
0.4784 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.3073 -  
val\_balanced\_f1\_score: 0.3192

Epoch 5/20

6/6 [=====] - 6s 1s/step - loss: 0.4663 - accuracy: 0.8765 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.2986 - balanced\_f1\_score: 0.3143 - val\_loss:  
0.4693 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.3073 -  
val\_balanced\_f1\_score: 0.3192

#### RUN #5

Epoch 1/20

6/6 [=====] - 45s 2s/step - loss: 0.8498 - accuracy: 0.6420 -  
balanced\_recall: 0.2043 - balanced\_precision: 0.2664 - balanced\_f1\_score: 0.2041 - val\_loss:  
0.4752 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124

Epoch 2/20

6/6 [=====] - 5s 922ms/step - loss: 0.5089 - accuracy: 0.8765 -  
balanced\_recall: 0.3314 - balanced\_precision: 0.2984 - balanced\_f1\_score: 0.3136 - val\_loss:

0.3884 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 - val\_balanced\_f1\_score: 0.3124

Epoch 3/20

6/6 [=====] - 6s 1s/step - loss: 0.4288 - accuracy: 0.8765 - balanced\_recall: 0.3333 - balanced\_precision: 0.2986 - balanced\_f1\_score: 0.3148 - val\_loss: 0.3813 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 - val\_balanced\_f1\_score: 0.3124

Epoch 4/20

6/6 [=====] - 3s 430ms/step - loss: 0.4456 - accuracy: 0.8765 - balanced\_recall: 0.3333 - balanced\_precision: 0.2986 - balanced\_f1\_score: 0.3147 - val\_loss: 0.3830 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 - val\_balanced\_f1\_score: 0.3124

Epoch 5/20

6/6 [=====] - 5s 913ms/step - loss: 0.4349 - accuracy: 0.8765 - balanced\_recall: 0.3333 - balanced\_precision: 0.2986 - balanced\_f1\_score: 0.3144 - val\_loss: 0.3809 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 - val\_balanced\_f1\_score: 0.3124

Epoch 6/20

6/6 [=====] - 5s 865ms/step - loss: 0.4166 - accuracy: 0.8765 - balanced\_recall: 0.3333 - balanced\_precision: 0.2986 - balanced\_f1\_score: 0.3147 - val\_loss: 0.3746 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 - val\_balanced\_f1\_score: 0.3124

Epoch 7/20

6/6 [=====] - 5s 890ms/step - loss: 0.3753 - accuracy: 0.8765 - balanced\_recall: 0.3333 - balanced\_precision: 0.2986 - balanced\_f1\_score: 0.3147 - val\_loss: 0.3711 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 - val\_balanced\_f1\_score: 0.3124

Epoch 8/20

6/6 [=====] - 5s 879ms/step - loss: 0.3895 - accuracy: 0.8765 - balanced\_recall: 0.3333 - balanced\_precision: 0.2986 - balanced\_f1\_score: 0.3146 - val\_loss: 0.3710 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 - val\_balanced\_f1\_score: 0.3124

Epoch 9/20

6/6 [=====] - 4s 789ms/step - loss: 0.3601 - accuracy: 0.8827 - balanced\_recall: 0.3444 - balanced\_precision: 0.3556 - balanced\_f1\_score: 0.3455 - val\_loss: 0.3708 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 - val\_balanced\_f1\_score: 0.3124

Epoch 10/20

6/6 [=====] - 5s 895ms/step - loss: 0.3522 - accuracy: 0.8827 - balanced\_recall: 0.3426 - balanced\_precision: 0.3571 - balanced\_f1\_score: 0.3450 - val\_loss: 0.3708 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 - val\_balanced\_f1\_score: 0.3124

Epoch 11/20

6/6 [=====] - 5s 909ms/step - loss: 0.3508 - accuracy: 0.8827 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.3000 - balanced\_f1\_score: 0.3154 - val\_loss:  
0.3702 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124

Epoch 12/20

6/6 [=====] - 5s 808ms/step - loss: 0.3319 - accuracy: 0.8765 -  
balanced\_recall: 0.3333 - balanced\_precision: 0.2986 - balanced\_f1\_score: 0.3147 - val\_loss:  
0.3687 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124

Epoch 13/20

6/6 [=====] - 5s 855ms/step - loss: 0.3196 - accuracy: 0.8889 -  
balanced\_recall: 0.3519 - balanced\_precision: 0.3574 - balanced\_f1\_score: 0.3505 - val\_loss:  
0.3686 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124

Epoch 14/20

6/6 [=====] - 4s 815ms/step - loss: 0.3035 - accuracy: 0.8889 -  
balanced\_recall: 0.3657 - balanced\_precision: 0.4128 - balanced\_f1\_score: 0.3824 - val\_loss:  
0.3664 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124

Epoch 15/20

6/6 [=====] - 5s 874ms/step - loss: 0.2969 - accuracy: 0.8951 -  
balanced\_recall: 0.4008 - balanced\_precision: 0.4455 - balanced\_f1\_score: 0.4108 - val\_loss:  
0.3629 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124

Epoch 16/20

6/6 [=====] - 5s 758ms/step - loss: 0.2895 - accuracy: 0.9012 -  
balanced\_recall: 0.4120 - balanced\_precision: 0.5272 - balanced\_f1\_score: 0.4580 - val\_loss:  
0.3584 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124

Epoch 17/20

6/6 [=====] - 5s 839ms/step - loss: 0.2639 - accuracy: 0.9136 -  
balanced\_recall: 0.4259 - balanced\_precision: 0.5044 - balanced\_f1\_score: 0.4512 - val\_loss:  
0.3547 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124

Epoch 18/20

6/6 [=====] - 3s 427ms/step - loss: 0.2735 - accuracy: 0.9074 -  
balanced\_recall: 0.3889 - balanced\_precision: 0.4748 - balanced\_f1\_score: 0.4229 - val\_loss:  
0.3625 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124

Epoch 19/20

6/6 [=====] - 3s 520ms/step - loss: 0.2725 - accuracy: 0.9074 -  
balanced\_recall: 0.4213 - balanced\_precision: 0.5318 - balanced\_f1\_score: 0.4672 - val\_loss:  
0.3662 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124

Epoch 20/20

6/6 [=====] - 5s 897ms/step - loss: 0.2490 - accuracy: 0.9074 -  
balanced\_recall: 0.3923 - balanced\_precision: 0.4205 - balanced\_f1\_score: 0.4043 - val\_loss:  
0.3644 - val\_accuracy: 0.8780 - val\_balanced\_recall: 0.3333 - val\_balanced\_precision: 0.2940 -  
val\_balanced\_f1\_score: 0.3124