

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

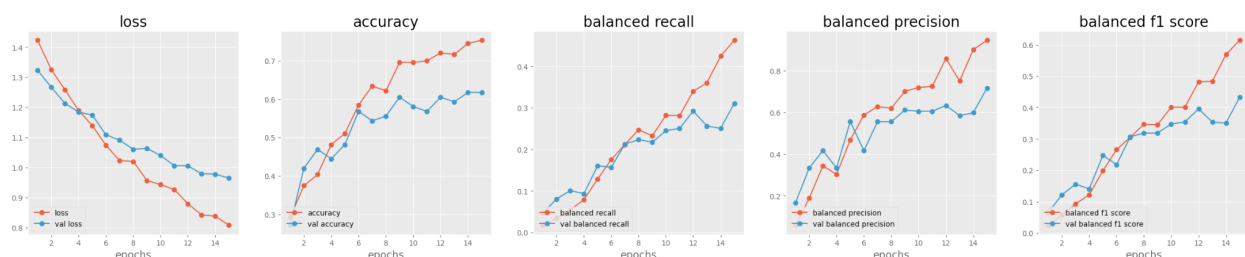
Epoch 24/40

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

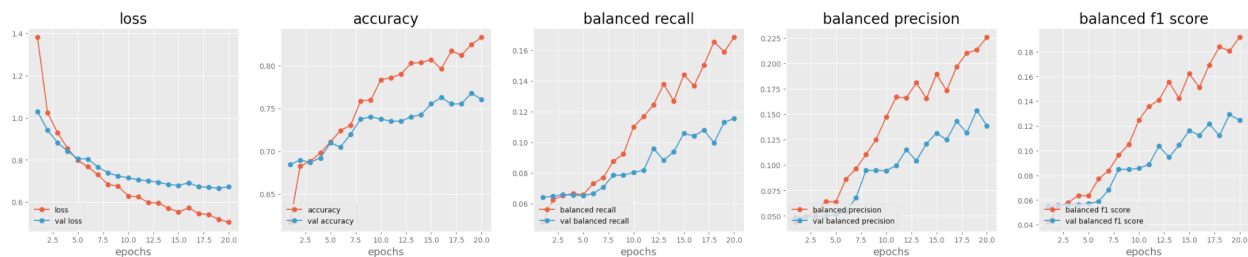
Epoch 19/20

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

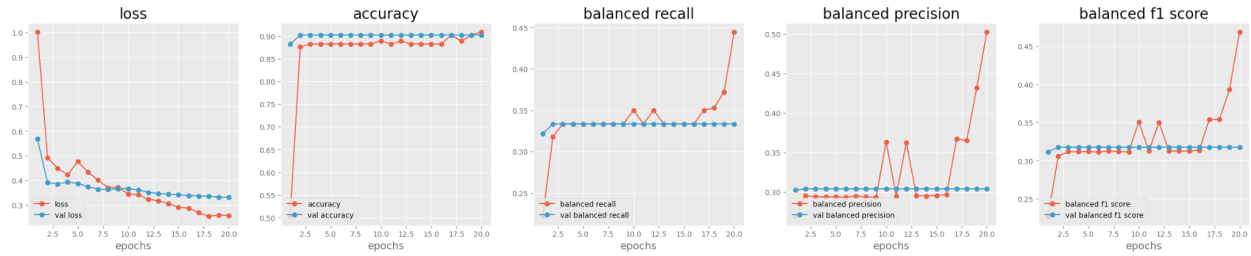
## **Sociocultural Forces**

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

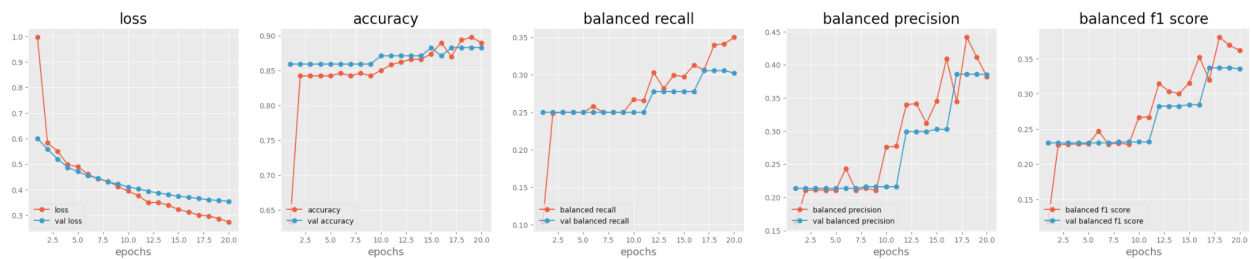


## EISabry Evidence-based categories:

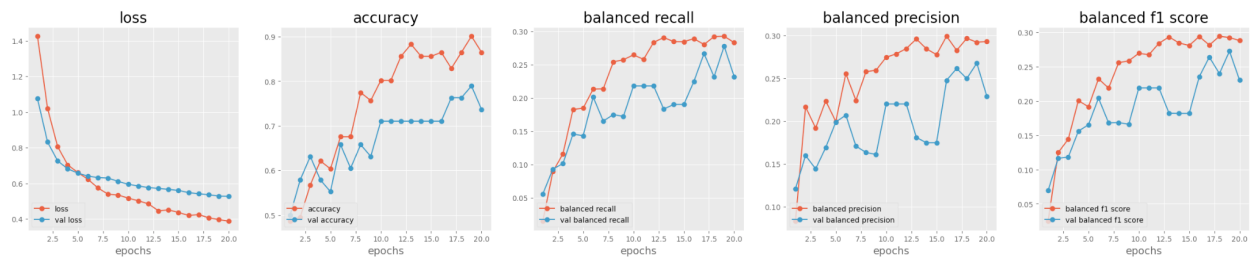
Epoch 19/20

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

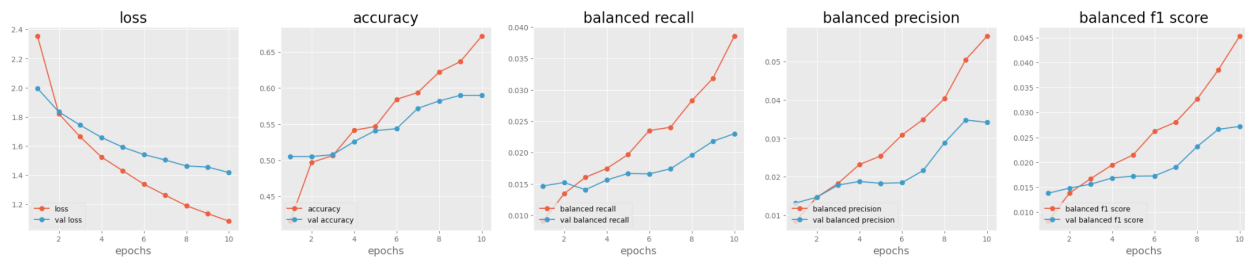


Epoch 19/20

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

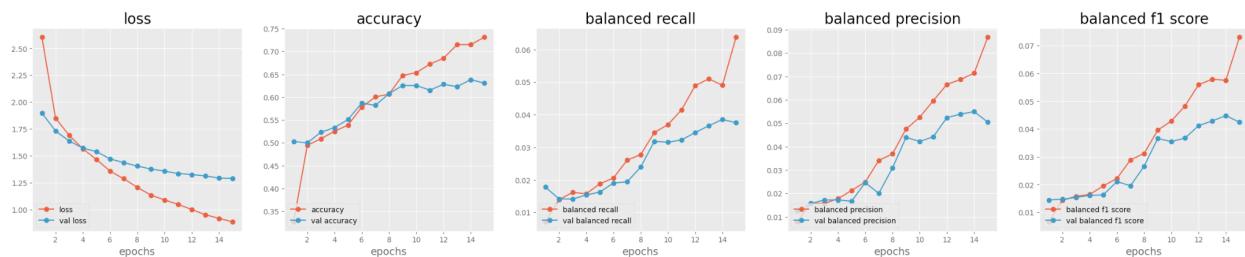
## HICKS Middle Category

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

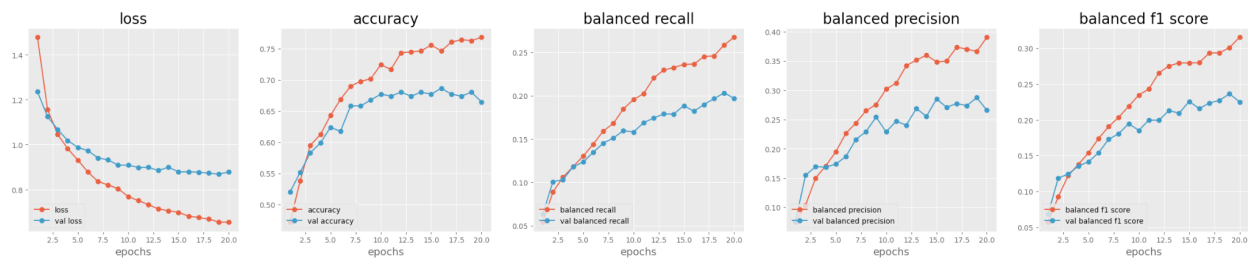
40/40 [=====] - 18s 460ms/step - loss: 0.7332 -  
accuracy: 0.7433 - balanced\_recall: 0.2202 - balanced\_precision: 0.3418 -  
balanced\_f1\_score: 0.2658 - val\_loss: 0.8990 - val\_accuracy: 0.6803 -

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

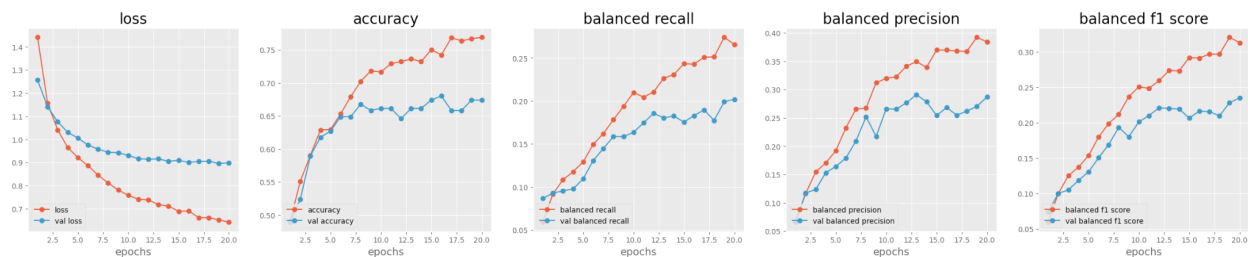
Epoch 16/20

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

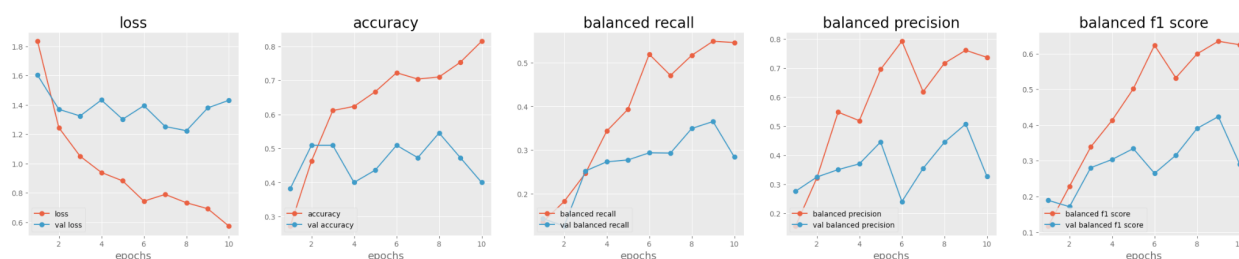
6/6 [=====] - 5s 879ms/step - loss: 0.7329 -  
accuracy: 0.7099 - balanced\_recall: 0.5165 - balanced\_precision: 0.7167 -  
balanced\_f1\_score: 0.5990 - val\_loss: 1.2244 - val\_accuracy: 0.5455 -  
val\_balanced\_recall: 0.3495 - val\_balanced\_precision: 0.4448 -  
val\_balanced\_f1\_score: 0.3905

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

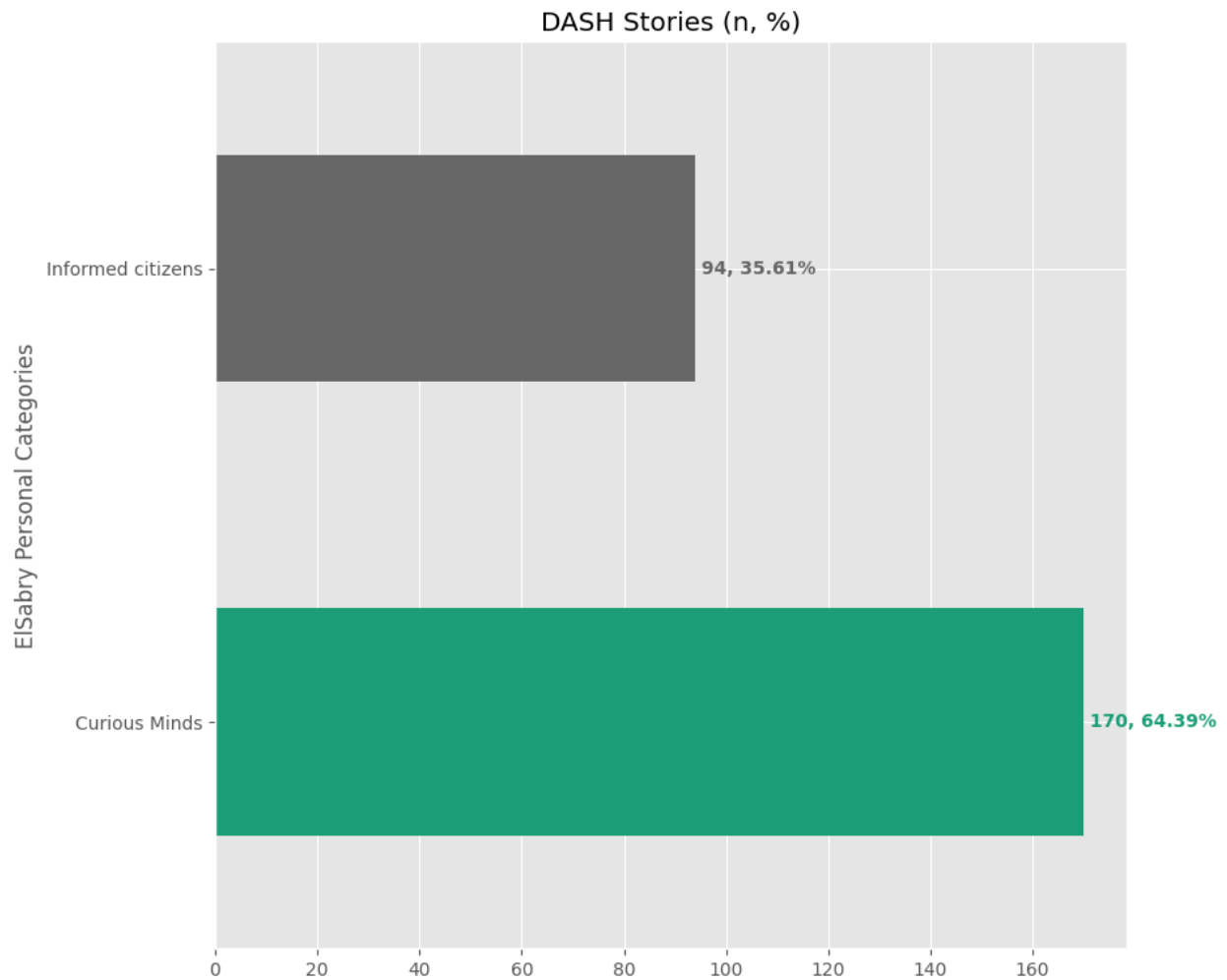
6/6 [=====] - 3s 437ms/step - loss: 0.2248 -  
accuracy: 0.9630 - balanced\_recall: 0.8296 - balanced\_precision: 0.8743 -  
balanced\_f1\_score: 0.8506 - val\_loss: 1.4246 - val\_accuracy: 0.5636 -  
val\_balanced\_recall: 0.4540 - val\_balanced\_precision: 0.5542 -  
val\_balanced\_f1\_score: 0.4972

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

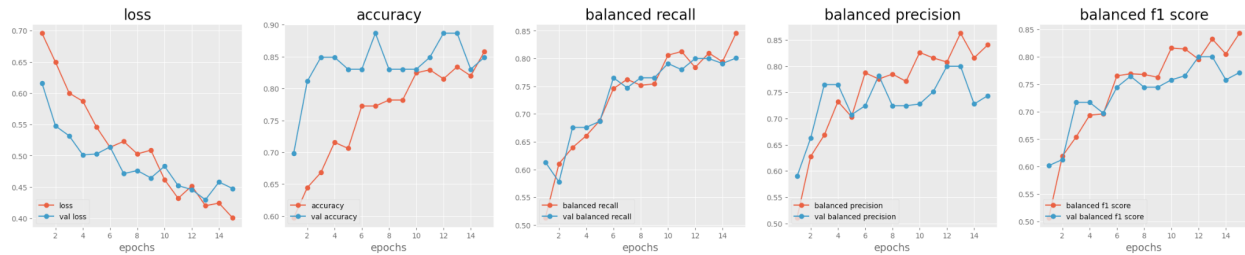
7/7 [=====] - 3s 479ms/step - loss: 0.4242 -  
accuracy: 0.8199 - balanced\_recall: 0.7941 - balanced\_precision: 0.8160 -  
balanced\_f1\_score: 0.8048 - val\_loss: 0.4579 - val\_accuracy: 0.8302 -  
val\_balanced\_recall: 0.7909 - val\_balanced\_precision: 0.7278 -  
val\_balanced\_f1\_score: 0.7578

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

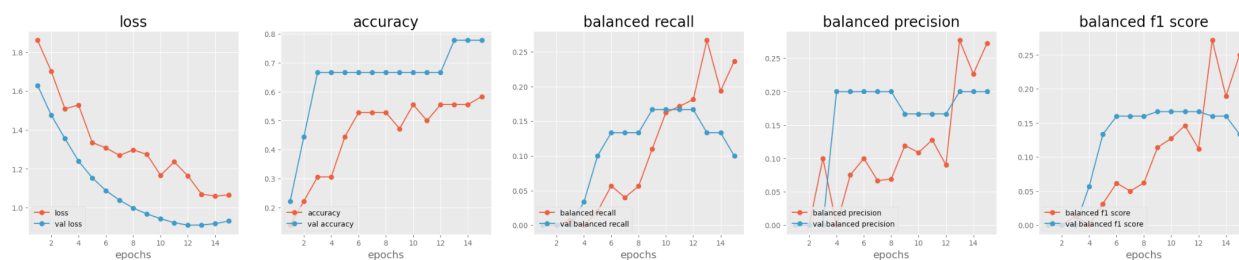
Epoch 11/15

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 -

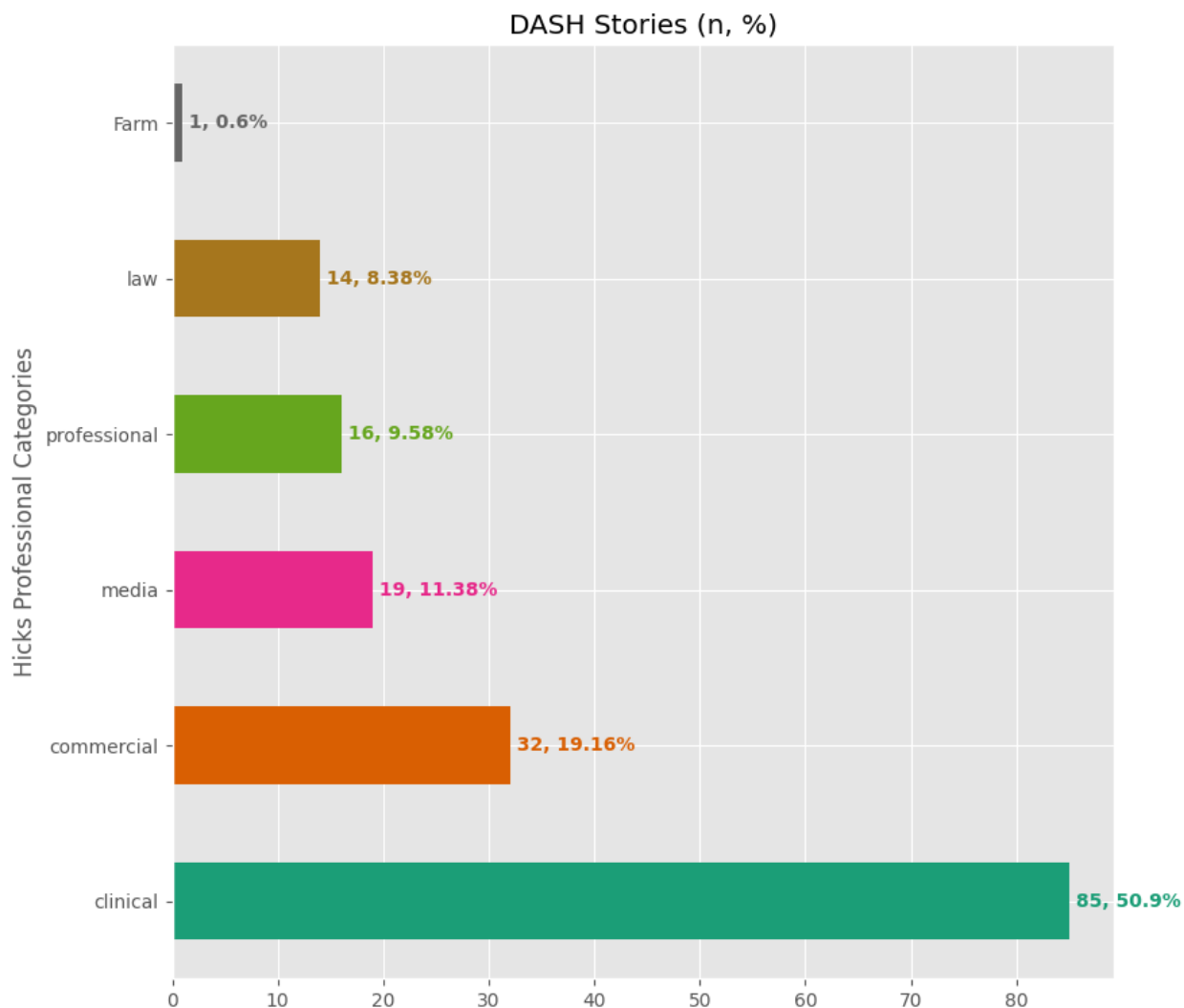
```

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

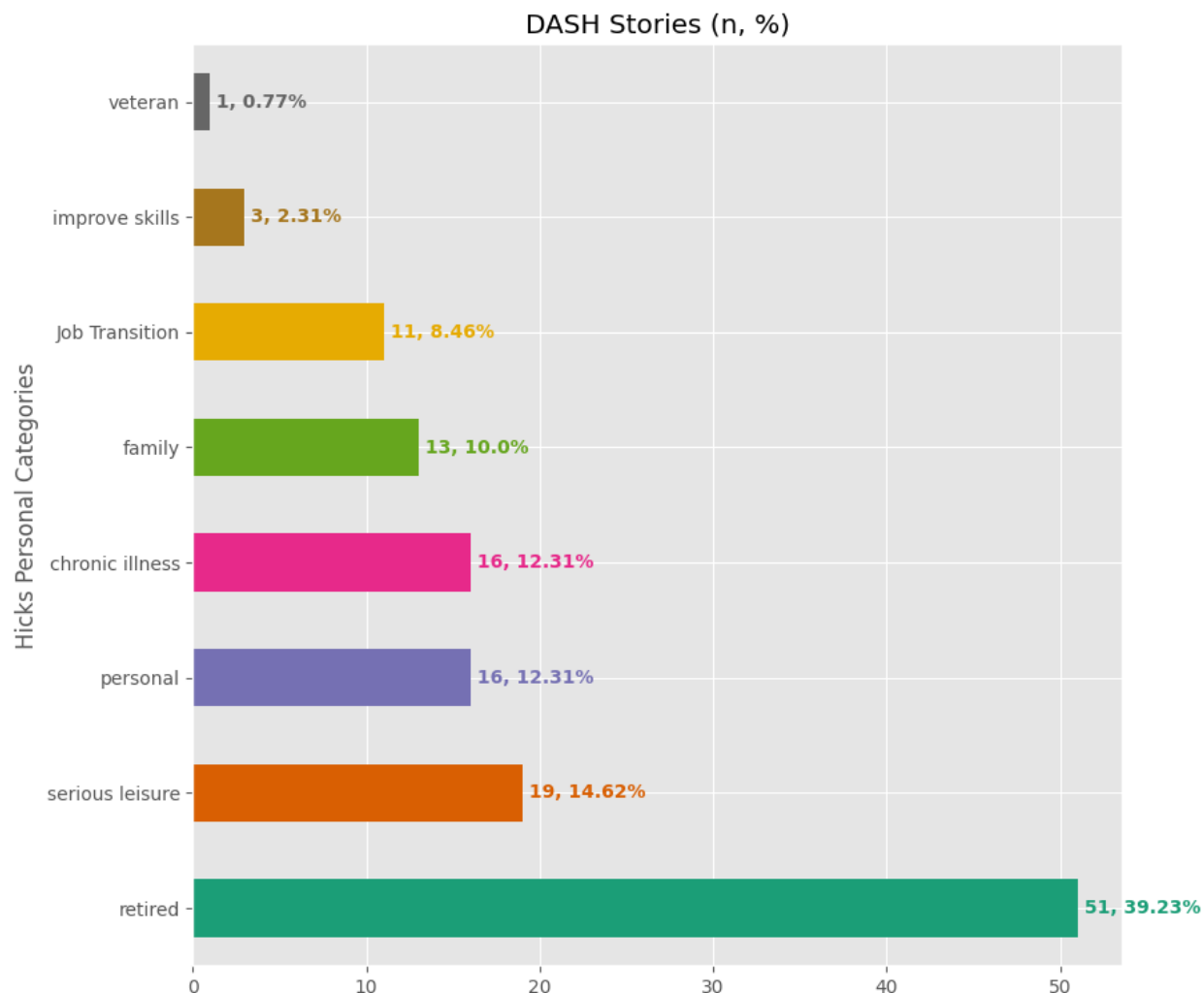
5/5 [=====] - 4s 935ms/step - loss: 0.6589 -  
accuracy: 0.7970 - balanced\_recall: 0.3439 - balanced\_precision: 0.4586 -  
balanced\_f1\_score: 0.3918 - val\_loss: 0.9772 - val\_accuracy: 0.6765 -  
val\_balanced\_recall: 0.2048 - val\_balanced\_precision: 0.2125 -  
val\_balanced\_f1\_score: 0.2085

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

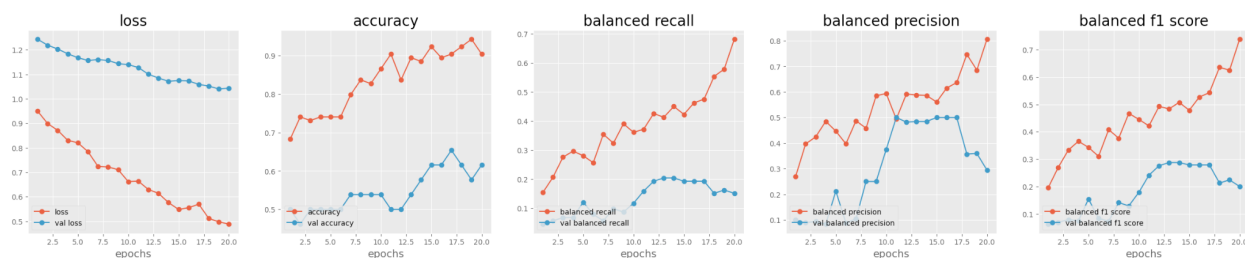
4/4 [=====] - 4s 1s/step - loss: 0.5112 -  
accuracy: 0.9231 - balanced\_recall: 0.5539 - balanced\_precision: 0.7465 -  
balanced\_f1\_score: 0.6352 - val\_loss: 1.0521 - val\_accuracy: 0.6154 -  
val\_balanced\_recall: 0.1515 - val\_balanced\_precision: 0.3571 -  
val\_balanced\_f1\_score: 0.2128

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

