Training on Fold 1

2024-04-20 22:25:19.525497: I tensorflow/core/platform/cpu\_feature\_guard.cc:182] This TensorFlow binary is optimized to use available CPU instructions in performance-critical operations.

To enable the following instructions: SSE SSE2 SSE3 SSE4.1 SSE4.2 AVX AVX2 FMA, in other operations, rebuild TensorFlow with the appropriate compiler flags.

Epoch 1/20

1282/1282 [==============================] - ETA: 0s - loss: 17.5788 - accuracy: 0.50822024-04-20 22:45:45.969880: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 21018624000 exceeds 10% of free system memory.

2024-04-20 22:47:05.284605: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 3701261760 exceeds 10% of free system memory.

2024-04-20 22:47:06.963243: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 2463498240 exceeds 10% of free system memory.

1282/1282 [==============================] - 1309s 1s/step - loss: 17.5788 - accuracy: 0.5082 - val\_loss: 12.0007 - val\_accuracy: 0.5121 - lr: 1.0000e-05

Epoch 2/20

1282/1282 [==============================] - ETA: 0s - loss: 8.4880 - accuracy: 0.58792024-04-20 23:07:26.693995: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 21018624000 exceeds 10% of free system memory.

2024-04-20 23:08:34.832819: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 3701261760 exceeds 10% of free system memory.

1282/1282 [==============================] - 1289s 1s/step - loss: 8.4880 - accuracy: 0.5879 - val\_loss: 5.6919 - val\_accuracy: 0.6440 - lr: 1.0000e-05

Epoch 3/20

1282/1282 [==============================] - 1232s 960ms/step - loss: 3.9113 - accuracy: 0.6866 - val\_loss: 2.5976 - val\_accuracy: 0.6659 - lr: 1.0000e-05

Epoch 4/20

1282/1282 [==============================] - 1178s 918ms/step - loss: 1.8242 - accuracy: 0.7623 - val\_loss: 1.3733 - val\_accuracy: 0.6598 - lr: 1.0000e-05

Epoch 5/20

1282/1282 [==============================] - 1141s 889ms/step - loss: 0.9529 - accuracy: 0.8071 - val\_loss: 0.9204 - val\_accuracy: 0.6531 - lr: 1.0000e-05

Epoch 6/20

1282/1282 [==============================] - 1188s 927ms/step - loss: 0.5910 - accuracy: 0.8338 - val\_loss: 0.7708 - val\_accuracy: 0.6483 - lr: 1.0000e-05

Epoch 7/20

1282/1282 [==============================] - 1259s 982ms/step - loss: 0.4359 - accuracy: 0.8502 - val\_loss: 0.7457 - val\_accuracy: 0.6462 - lr: 1.0000e-05

Epoch 8/20

1282/1282 [==============================] - 1157s 902ms/step - loss: 0.3647 - accuracy: 0.8620 - val\_loss: 0.7720 - val\_accuracy: 0.6424 - lr: 1.0000e-05

Epoch 9/20

1282/1282 [==============================] - 1222s 952ms/step - loss: 0.3268 - accuracy: 0.8725 - val\_loss: 0.8205 - val\_accuracy: 0.6402 - lr: 1.0000e-05

Epoch 10/20

1282/1282 [==============================] - 1179s 920ms/step - loss: 0.3026 - accuracy: 0.8820 - val\_loss: 0.8703 - val\_accuracy: 0.6364 - lr: 1.0000e-05

Epoch 11/20

1282/1282 [==============================] - 1191s 928ms/step - loss: 0.2835 - accuracy: 0.8904 - val\_loss: 0.9192 - val\_accuracy: 0.6312 - lr: 1.0000e-05

Epoch 12/20

1282/1282 [==============================] - ETA: 0s - loss: 0.2670 - accuracy: 0.8993

Epoch 12: ReduceLROnPlateau reducing learning rate to 5.999999848427251e-06.

1282/1282 [==============================] - 1221s 952ms/step - loss: 0.2670 - accuracy: 0.8993 - val\_loss: 0.9680 - val\_accuracy: 0.6252 - lr: 1.0000e-05

Training on Fold 2

Epoch 1/20

1282/1282 [==============================] - 1144s 890ms/step - loss: 17.5794 - accuracy: 0.5079 - val\_loss: 12.0003 - val\_accuracy: 0.5049 - lr: 1.0000e-05

Epoch 2/20

1282/1282 [==============================] - 1183s 923ms/step - loss: 8.4885 - accuracy: 0.5518 - val\_loss: 5.6983 - val\_accuracy: 0.6233 - lr: 1.0000e-05

Epoch 3/20

1282/1282 [==============================] - 1178s 918ms/step - loss: 3.9465 - accuracy: 0.6616 - val\_loss: 2.5792 - val\_accuracy: 0.6723 - lr: 1.0000e-05

Epoch 4/20

1282/1282 [==============================] - 1182s 921ms/step - loss: 1.8244 - accuracy: 0.7460 - val\_loss: 1.3516 - val\_accuracy: 0.6635 - lr: 1.0000e-05

Epoch 5/20

1282/1282 [==============================] - 1119s 872ms/step - loss: 0.9586 - accuracy: 0.7978 - val\_loss: 0.9034 - val\_accuracy: 0.6582 - lr: 1.0000e-05

Epoch 6/20

1282/1282 [==============================] - 1133s 883ms/step - loss: 0.5988 - accuracy: 0.8282 - val\_loss: 0.7552 - val\_accuracy: 0.6510 - lr: 1.0000e-05

Epoch 7/20

1282/1282 [==============================] - 1148s 895ms/step - loss: 0.4422 - accuracy: 0.8465 - val\_loss: 0.7293 - val\_accuracy: 0.6478 - lr: 1.0000e-05

Epoch 8/20

1282/1282 [==============================] - 1137s 886ms/step - loss: 0.3703 - accuracy: 0.8597 - val\_loss: 0.7587 - val\_accuracy: 0.6465 - lr: 1.0000e-05

Epoch 9/20

1282/1282 [==============================] - 1129s 880ms/step - loss: 0.3325 - accuracy: 0.8695 - val\_loss: 0.7979 - val\_accuracy: 0.6378 - lr: 1.0000e-05

Epoch 10/20

1282/1282 [==============================] - 1127s 879ms/step - loss: 0.3069 - accuracy: 0.8796 - val\_loss: 0.8421 - val\_accuracy: 0.6362 - lr: 1.0000e-05

Epoch 11/20

1282/1282 [==============================] - 1101s 858ms/step - loss: 0.2874 - accuracy: 0.8889 - val\_loss: 0.8982 - val\_accuracy: 0.6333 - lr: 1.0000e-05

Epoch 12/20

1282/1282 [==============================] - ETA: 0s - loss: 0.2705 - accuracy: 0.8977

Epoch 12: ReduceLROnPlateau reducing learning rate to 5.999999848427251e-06.

1282/1282 [==============================] - 1130s 880ms/step - loss: 0.2705 - accuracy: 0.8977 - val\_loss: 0.9528 - val\_accuracy: 0.6291 - lr: 1.0000e-05

Training on Fold 3

Epoch 1/20

1282/1282 [==============================] - 1101s 857ms/step - loss: 17.5604 - accuracy: 0.5056 - val\_loss: 11.9865 - val\_accuracy: 0.5485 - lr: 1.0000e-05

Epoch 2/20

1282/1282 [==============================] - 1097s 855ms/step - loss: 8.4782 - accuracy: 0.5645 - val\_loss: 5.6894 - val\_accuracy: 0.6326 - lr: 1.0000e-05

Epoch 3/20

1282/1282 [==============================] - 1101s 858ms/step - loss: 3.9244 - accuracy: 0.6715 - val\_loss: 2.5820 - val\_accuracy: 0.6676 - lr: 1.0000e-05

Epoch 4/20

1282/1282 [==============================] - 1086s 847ms/step - loss: 1.8204 - accuracy: 0.7531 - val\_loss: 1.3589 - val\_accuracy: 0.6624 - lr: 1.0000e-05

Epoch 5/20

1282/1282 [==============================] - 1085s 846ms/step - loss: 0.9549 - accuracy: 0.8011 - val\_loss: 0.9077 - val\_accuracy: 0.6559 - lr: 1.0000e-05

Epoch 6/20

1282/1282 [==============================] - 1068s 833ms/step - loss: 0.5953 - accuracy: 0.8297 - val\_loss: 0.7642 - val\_accuracy: 0.6477 - lr: 1.0000e-05

Epoch 7/20

1282/1282 [==============================] - 1096s 854ms/step - loss: 0.4400 - accuracy: 0.8476 - val\_loss: 0.7378 - val\_accuracy: 0.6435 - lr: 1.0000e-05

Epoch 8/20

1282/1282 [==============================] - 1091s 851ms/step - loss: 0.3688 - accuracy: 0.8598 - val\_loss: 0.7638 - val\_accuracy: 0.6407 - lr: 1.0000e-05

Epoch 9/20

1282/1282 [==============================] - 1088s 847ms/step - loss: 0.3306 - accuracy: 0.8711 - val\_loss: 0.8051 - val\_accuracy: 0.6341 - lr: 1.0000e-05

Epoch 10/20

1282/1282 [==============================] - 1086s 846ms/step - loss: 0.3059 - accuracy: 0.8801 - val\_loss: 0.8617 - val\_accuracy: 0.6316 - lr: 1.0000e-05

Epoch 11/20

1282/1282 [==============================] - 1098s 856ms/step - loss: 0.2866 - accuracy: 0.8887 - val\_loss: 0.9168 - val\_accuracy: 0.6310 - lr: 1.0000e-05

Epoch 12/20

1282/1282 [==============================] - ETA: 0s - loss: 0.2699 - accuracy: 0.8978

Epoch 12: ReduceLROnPlateau reducing learning rate to 5.999999848427251e-06.

1282/1282 [==============================] - 1106s 862ms/step - loss: 0.2699 - accuracy: 0.8978 - val\_loss: 0.9699 - val\_accuracy: 0.6237 - lr: 1.0000e-05

3844/3844 [==============================] - 50s 13ms/step

Test Metrics:

Precision: 0.6467

Recall: 0.6300

F1 Score: 0.6383

ROC AUC: 0.7500

PR AUC: 0.7898

MCC: 0.2860

y\_test\_pred = (test\_scores > 0.6).astype(int)

...: y\_test\_true = y\_test.astype(int)

...:

...: # Calculate and display evaluation metrics for the test set

...: precision\_test = precision\_score(y\_test\_true, y\_test\_pred)

...: recall\_test = recall\_score(y\_test\_true, y\_test\_pred)

...: f1\_test = f1\_score(y\_test\_true, y\_test\_pred)

...: roc\_auc\_test = roc\_auc\_score(y\_test\_true, test\_scores)

...: pr\_auc\_test = average\_precision\_score(y\_test\_true, test\_scores)

...: mcc\_test = matthews\_corrcoef(y\_test\_true, y\_test\_pred)

...:

...: print("\nTest Metrics:")

...: print(f'Precision: {precision\_test:.4f}')

...: print(f'Recall: {recall\_test:.4f}')

...: print(f'F1 Score: {f1\_test:.4f}')

...: print(f'ROC AUC: {roc\_auc\_test:.4f}')

...: print(f'PR AUC: {pr\_auc\_test:.4f}')

...: print(f'MCC: {mcc\_test:.4f}')

...:

Test Metrics:

Precision: 0.6737

Recall: 0.5764

F1 Score: 0.6213

ROC AUC: 0.7500

PR AUC: 0.7898

MCC: 0.3004

In [5]: y\_test\_pred = (test\_scores > 0.7).astype(int)

...: y\_test\_true = y\_test.astype(int)

...:

...: # Calculate and display evaluation metrics for the test set

...: precision\_test = precision\_score(y\_test\_true, y\_test\_pred)

...: recall\_test = recall\_score(y\_test\_true, y\_test\_pred)

...: f1\_test = f1\_score(y\_test\_true, y\_test\_pred)

...: roc\_auc\_test = roc\_auc\_score(y\_test\_true, test\_scores)

...: pr\_auc\_test = average\_precision\_score(y\_test\_true, test\_scores)

...: mcc\_test = matthews\_corrcoef(y\_test\_true, y\_test\_pred)

...:

...: print("\nTest Metrics:")

...: print(f'Precision: {precision\_test:.4f}')

...: print(f'Recall: {recall\_test:.4f}')

...: print(f'F1 Score: {f1\_test:.4f}')

...: print(f'ROC AUC: {roc\_auc\_test:.4f}')

...: print(f'PR AUC: {pr\_auc\_test:.4f}')

...: print(f'MCC: {mcc\_test:.4f}')

...:

Test Metrics:

Precision: 0.7125

Recall: 0.5241

F1 Score: 0.6039

ROC AUC: 0.7500

PR AUC: 0.7898

MCC: 0.3241

Εικόνα που περιέχει κείμενο, διάγραμμα, γραμμή, γράφημα

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, διάγραμμα, γραμμή

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