2024-05-16 22:15:38.985134: 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 1/5

2024-05-16 22:15:40.623276: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 2080374784 exceeds 10% of free system memory.

2024-05-16 22:15:41.955173: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 2080374784 exceeds 10% of free system memory.

2024-05-16 22:15:42.123594: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 2080374784 exceeds 10% of free system memory.

2024-05-16 22:15:43.253123: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 2080374784 exceeds 10% of free system memory.

2024-05-16 22:15:43.390153: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 2080374784 exceeds 10% of free system memory.

1682/1682 [==============================] - 22114s 13s/step - loss: 3.6444 - accuracy: 0.8294 - val\_loss: 1.3225 - val\_accuracy: 0.9145 - lr: 5.0000e-05

Epoch 2/5

1682/1682 [==============================] - 19987s 12s/step - loss: 0.6506 - accuracy: 0.9690 - val\_loss: 0.2842 - val\_accuracy: 0.9911 - lr: 5.0000e-05

Epoch 3/5

1682/1682 [==============================] - 20838s 12s/step - loss: 0.2058 - accuracy: 0.9894 - val\_loss: 0.1535 - val\_accuracy: 0.9910 - lr: 5.0000e-05

Epoch 4/5

1682/1682 [==============================] - 20395s 12s/step - loss: 0.1277 - accuracy: 0.9923 - val\_loss: 0.1322 - val\_accuracy: 0.9846 - lr: 5.0000e-05

Epoch 5/5

1682/1682 [==============================] - 20309s 12s/step - loss: 0.0943 - accuracy: 0.9945 - val\_loss: 0.1089 - val\_accuracy: 0.9867 - lr: 5.0000e-05

2883/2883 [==============================] - 1361s 472ms/step

Evaluation Metrics:

Precision: 0.9929

Recall: 0.9794

F1 Score: 0.9861

ROC AUC: 0.9991

PR AUC: 0.9991

MCC: 0.9725

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

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

...:

...: # Calculate evaluation metrics

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

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

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

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

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

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

...:

...: # Display evaluation metrics

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

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

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

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

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

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

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

...:

Evaluation Metrics:

Precision: 0.9936

Recall: 0.9730

F1 Score: 0.9832

ROC AUC: 0.9991

PR AUC: 0.9991

MCC: 0.9669

In [11]: y\_pred = (test\_scores > 0.7).astype(int)

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

...:

...: # Calculate evaluation metrics

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

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

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

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

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

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

...:

...: # Display evaluation metrics

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

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

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

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

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

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

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

...:

Evaluation Metrics:

Precision: 0.9943

Recall: 0.9643

F1 Score: 0.9790

ROC AUC: 0.9991

PR AUC: 0.9991

MCC: 0.9591

Εικόνα που περιέχει κείμενο, διάγραμμα, γραμμή, γράφημα

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, διάγραμμα, γράφημα

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, διάγραμμα, ορθογώνιο παραλληλόγραμμο

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, γραμμή, γράφημα, διάγραμμα

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, διάγραμμα, πολυχρωμία

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, διάγραμμα, πολυχρωμία

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, διάγραμμα, οθόνη

Περιγραφή που δημιουργήθηκε αυτόματα

Triplet 1 (Original):

Subject: https://ec.europa.eu/eurostat/NLP4StatRef/knowledge/hlth\_ehis\_aw1u, Predicate: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/term, Object: hlth\_ehis\_aw1u

157/157 [==============================] - 63s 400ms/step

Intercept 0.530730639079105

Prediction\_local [0.42786971]

Right: 0.44948846

Feature Importances (Coefficients):

Subject: -0.1499722441169136

Predicate: 0.04585027677079377

Object: 0.001261036874442027

Triplet 2 (Original):

Subject: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/ei\_qna, Predicate: http://www.w3.org/1999/02/22-rdf-syntax-ns#type, Object: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/StatisticalData

157/157 [==============================] - 62s 393ms/step

Intercept 0.6381247514344854

Prediction\_local [0.18377046]

Right: 0.02005542

Feature Importances (Coefficients):

Predicate: -0.21939522098138708

Subject: -0.15423610108404398

Object: -0.08072296605471124

Triplet 3 (Original):

Subject: https://ec.europa.eu/eurostat/NLP4StatRef/knowledge/paragraph9574\_3455, Predicate: http://www.w3.org/1999/02/22-rdf-syntax-ns#type, Object: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/Paragraph

157/157 [==============================] - 62s 393ms/step

Intercept 0.6095445477181541

Prediction\_local [0.16130093]

Right: 0.026353713

Feature Importances (Coefficients):

Subject: -0.2188148808937203

Predicate: -0.21485911611540753

Object: -0.014569620814457519

Triplet 4 (Original):

Subject: https://ec.europa.eu/eurostat/NLP4StatRef/knowledge/glossaryArticle118, Predicate: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/hasReference, Object: https://ec.europa.eu/eurostat/NLP4StatRef/knowledge/referenceSource59

157/157 [==============================] - 62s 392ms/step

Intercept 0.504168651086281

Prediction\_local [0.34538485]

Right: 0.01866787

Feature Importances (Coefficients):

Object: -0.36353769945244807

Predicate: 0.16397087414389738

Subject: 0.040783019837677244

Triplet 5 (Original):

Subject: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/fats\_08, Predicate: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/level, Object: 4

157/157 [==============================] - 63s 399ms/step

Intercept 0.3050144171513215

Prediction\_local [1.1614796]

Right: 0.9915123

Feature Importances (Coefficients):

Object: 0.37987553402106916

Subject: 0.37967925648482675

Predicate: 0.09691039331183939