Epoch 1/15

3363/3363 [==============================] - 7373s 2s/step - loss: 2.6414 - accuracy: 0.8911 - val\_loss: 0.1922 - val\_accuracy: 0.9733 - lr: 5.0000e-05

Epoch 2/15

3363/3363 [==============================] - 7373s 2s/step - loss: 0.0778 - accuracy: 0.9899 - val\_loss: 0.0710 - val\_accuracy: 0.9851 - lr: 5.0000e-05

Epoch 3/15

3363/3363 [==============================] - 7898s 2s/step - loss: 0.0262 - accuracy: 0.9967 - val\_loss: 0.0600 - val\_accuracy: 0.9876 - lr: 5.0000e-05

Epoch 4/15

3363/3363 [==============================] - 7693s 2s/step - loss: 0.0153 - accuracy: 0.9985 - val\_loss: 0.0542 - val\_accuracy: 0.9887 - lr: 5.0000e-05

Epoch 5/15

3363/3363 [==============================] - 7646s 2s/step - loss: 0.0118 - accuracy: 0.9989 - val\_loss: 0.0541 - val\_accuracy: 0.9889 - lr: 5.0000e-05

Epoch 6/15

3363/3363 [==============================] - 7325s 2s/step - loss: 0.0094 - accuracy: 0.9992 - val\_loss: 0.0518 - val\_accuracy: 0.9899 - lr: 5.0000e-05

Epoch 7/15

3363/3363 [==============================] - 7378s 2s/step - loss: 0.0072 - accuracy: 0.9995 - val\_loss: 0.0427 - val\_accuracy: 0.9907 - lr: 5.0000e-05

Epoch 8/15

3363/3363 [==============================] - 7192s 2s/step - loss: 0.0056 - accuracy: 0.9997 - val\_loss: 0.0431 - val\_accuracy: 0.9907 - lr: 5.0000e-05

Epoch 9/15

3363/3363 [==============================] - 7060s 2s/step - loss: 0.0044 - accuracy: 0.9998 - val\_loss: 0.0438 - val\_accuracy: 0.9912 - lr: 5.0000e-05

Epoch 10/15

3363/3363 [==============================] - 7069s 2s/step - loss: 0.0029 - accuracy: 0.9999 - val\_loss: 0.0369 - val\_accuracy: 0.9921 - lr: 2.5000e-05

Epoch 11/15

3363/3363 [==============================] - 7199s 2s/step - loss: 0.0022 - accuracy: 1.0000 - val\_loss: 0.0400 - val\_accuracy: 0.9917 - lr: 2.5000e-05

Epoch 12/15

3363/3363 [==============================] - 7099s 2s/step - loss: 0.0020 - accuracy: 1.0000 - val\_loss: 0.0391 - val\_accuracy: 0.9913 - lr: 2.5000e-05

Epoch 13/15

3363/3363 [==============================] - 7551s 2s/step - loss: 0.0016 - accuracy: 1.0000 - val\_loss: 0.0373 - val\_accuracy: 0.9912 - lr: 1.2500e-05

5765/5765 [==============================] - 243s 42ms/step

Evaluation Metrics:

Precision: 0.9863

Recall: 0.9820

F1 Score: 0.9841

ROC AUC: 0.9979

PR AUC: 0.9968

MCC: 0.9786

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

...: y\_true = y\_test\_augmented.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: 0.9873

Recall: 0.9806

F1 Score: 0.9839

ROC AUC: 0.9979

PR AUC: 0.9968

MCC: 0.9784

y\_pred = (test\_scores > 0.7).astype(int)

...: y\_true = y\_test\_augmented.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: 0.9880

Recall: 0.9788

F1 Score: 0.9834

ROC AUC: 0.9979

PR AUC: 0.9968

MCC: 0.9776

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

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, γραμμή, γράφημα

Περιγραφή που δημιουργήθηκε αυτόματα

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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 [==============================] - 6s 41ms/step

Intercept 0.3816118565854546

Prediction\_local [1.13801462]

Right: 0.99999666

Feature Importances (Coefficients):

Object: 0.3953598709739664

Subject: 0.2565533976416081

Predicate: 0.10448949385003237

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 [==============================] - 7s 42ms/step

Intercept 0.5794718101042327

Prediction\_local [0.65894088]

Right: 0.0982812

Feature Importances (Coefficients):

Object: 0.22276803461227876

Subject: -0.21904172784484668

Predicate: 0.07574276420759161

Triplet 3 (Original):

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

157/157 [==============================] - 6s 40ms/step

Intercept 0.9202533941343647

Prediction\_local [0.14278665]

Right: 0.00016950576

Feature Importances (Coefficients):

Object: -0.6714694925692143

Predicate: -0.055181894088162625

Subject: -0.050815355815849485

Triplet 4 (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 [==============================] - 6s 40ms/step

Intercept 0.40430202331998516

Prediction\_local [1.10502433]

Right: 0.98402816

Feature Importances (Coefficients):

Object: 0.33106524986318786

Subject: 0.27742611876998546

Predicate: 0.09223093628957418

Triplet 5 (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 [==============================] - 6s 40ms/step

Intercept 0.9606692585817834

Prediction\_local [-0.02738318]

Right: 0.00032635237

Feature Importances (Coefficients):

Object: -0.6626293574509472

Subject: -0.19027780999030697

Predicate: -0.13514527091608453