AI-Generated Text Detection Using Ensemble and Combined Model Training

NLP M&S team

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CLIN33 Shared task

The CLIN33 shared task addresses the crucial need to differentiate between human-written content and text generated by AI language models.

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Data Acquisition and Integration

- Read the primary development dataset.
- Integrate external data sources:
  - `'AuTexTification_train'`
  - `'AuTexTification_test'`

AUTEXTIFICATION 🤖👩🏻

AuTexTification: Automated Text Identification shared task

Data Pre-processing

- Convert text to lowercase.
- Remove URLs, special characters, and punctuation.
- Tokenize sentences.
- Lemmatization using `WordNetLemmatizer`.

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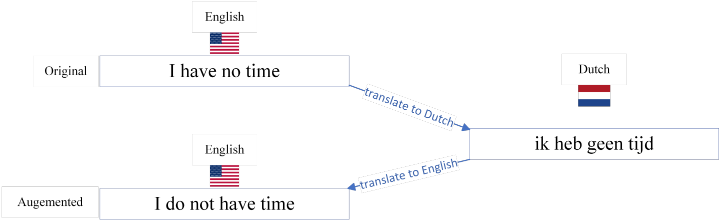
Data Augmentation Techniques

- Synonym augmentation: `aug_synonym.augment`
- Word swapping, insertion, substitution, deletion
- Introducing spelling variations
- Back translation techniques: English ¡-¿ Dutch
- ~~Paraphrasing by free generative AI models (such as GPT-2)~~



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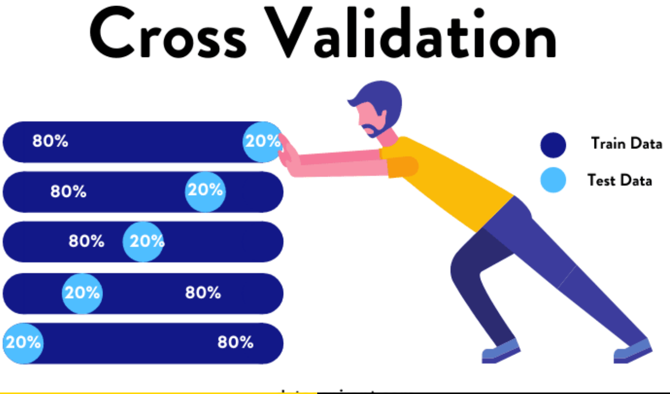
Cross-Validation Data Preparation

- Utilize `StratifiedKFold`
- Address class imbalance:
  - `RandomOverSampler`
  - `SMOTE`
- Compute class weights for balanced training.



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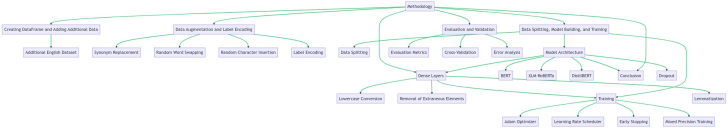
CustomBERT Model Architecture

- Build and fine-tune sequence classification BERT model using:
  - bert-base-multilingual-cased
  - xlm-roberta-base
  - distilbert-base-multilingual-cased.
- Classification layer with `Dense` and `softmax`.
- Configuration: `Adam`, loss function, accuracy metric.



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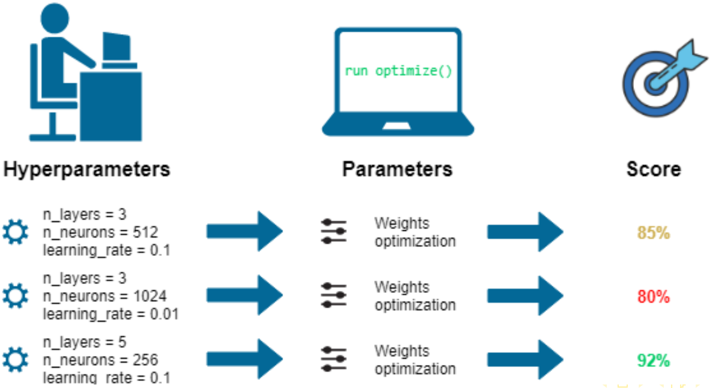
Hyperparameter Optimization

- Early stopping criteria.
- Learning rate scheduler setup.
- Fine-tuning and hyperparameter search space.
- Optimal hyperparameter identification.



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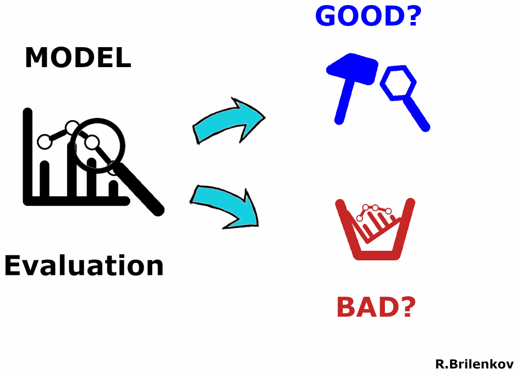
Evaluation on 'AuTexTification_test'

- Segment test data based on language and resource.
- Essential metrics: Accuracy, F1 Score, Recall, Precision.
- Average metrics across fold divisions.



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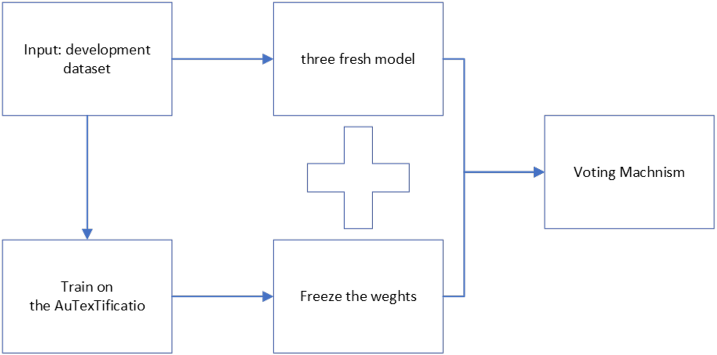
Combined Model

- Freeze weights of models trained on 'AuTexTification_train'.
- Integrate models: BERT, XLM-Roberta, DistilBERT.
- Employ a voting mechanism for the integrated models.



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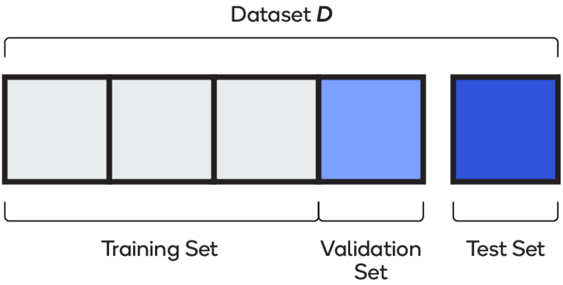
Evaluation on Test Data

- Use untouched 10% of original dataset.
- Report performance metrics.
- Highlight: Achieved F1 score of 74%.



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Thank You!

Thank you for your attention!

For further questions or details, please contact:

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