IDENTIFYING ADVERSE DRUG REACTIONS AND PERSONAL HEALTH EXPERIE

An Important Problem

Our Reseach goal is to show the effectiveness of Transfer Learning approaches like BERT and ULMFiT, and how they generalize for the classification tasks like identification of adverse drug reaction mentions and reporting of personal health problems in tweets. We work on three sub-problems:

- Automatic classifications of adverse effects mentions in tweets
- Extraction of Adverse Effect mentions
- Generalizable identification of personal health experience mentions

Automatic classifications and Extraction of adverse effects mentions in tweets

Problem Definition Sub-task 1: Given a labeled dataset D of tweets, the objective of the task is to learn a classification/prediction function that can predict a label l for a given tweet t, where $l \in I$ {reporting adverse effects of drugs (ADR) - 1, no adverse effects of drugs (non-ADR) - 0.

Dataset Sub-task 1: A total of 25.672 tweets are made available for training, out of which 2,374 contain adverse drug reaction (ADR) mention and the rest (23,298) do not. F1 score for ADR class was used as metric [1]



Problem Definition Sub-task 2: The motive of this sub-task is to first discern ADR tweets from the non-ADR ones and then identify the span of a tweet where an adverse drug effect is reported. An example of a span from a tweet that represents the mention of adverse drug reactions:

• anybody taken cipro? (antibiotic) complications?? big side effect *is tendon rupture*, where *tendon rupture* is the adverse drug reaction that needs to be identified and extracted from the tweet, which is most likely caused by the intake of the drug named *cipro*.

S Anand[†], D Mahata[‡], H Zhang[‡], S Shaid^{δ}, L Mehnaz^{δ}, Y Kumar^{η}, R Shah

† NSIT, Delhi University,
‡ Bloomberg USA $^{\delta}$ DTU-Delhi , $^{\eta}$ Adobe India ,
 $^{\lambda}$ IIIT Delhi



Results for Task-2: Extracting spans of text expressing adverse drug reactions in Tweets

Model	Relaxed F1	Relaxed Precision	Relaxed Recall	Strict F1	Strict Precision	Strict Recall
BLSTM + CRF Tagger with stacked BERT and Glove Embedding	0.638	0.532	0.796	0.315	0.262	0.395
BLSTM + CRF Tagger BERT and Flair Embeddings	0.641	0.537	0.793	0.328	0.274	0.409







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References

[1] Davy Weissenbacher et al. "Overview of the Fourth Social Media Mining for Health (SMM4H) Shared Task at ACL 2019". In: Proceedings of the 2019 ACL Workshop SMM4H: The 4th Social Media Mining for Health Applications Workshop Shared Task. 2019.