

How Can Natural Language Processing Support Emergency Management?

NLP FOR CLASSIFICATION OF TWEETS DURING CRISIS-EVENTS

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Problem Statement



Dataset



Name
@Username

Major risk of flooding in Calgary. Follow directions here:
<http://t.co/7dLx8aZptf> and stay tuned. Please RT
widely. #YYC

9:36 AM · Aug 10, 2012



Informative



Name
@Username

It is doing some raining #on-the-farm!!! LORD send off
this to put out the fires in Colorado. #Thru-the-flames
safety!!! #Beloved-of-GOD

12:04 PM · Jun 4, 2013

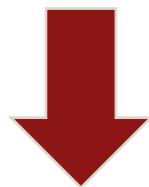


Not Informative

Problem Statement

Scenario 1

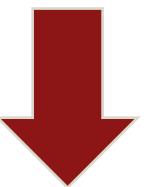
Training



Testing

Scenario 2

Training



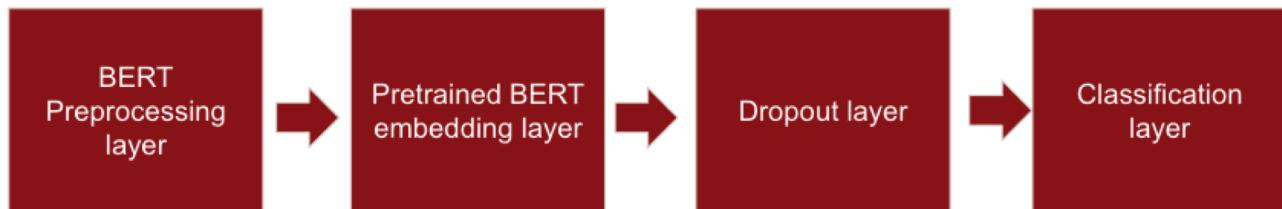
Testing

Methods

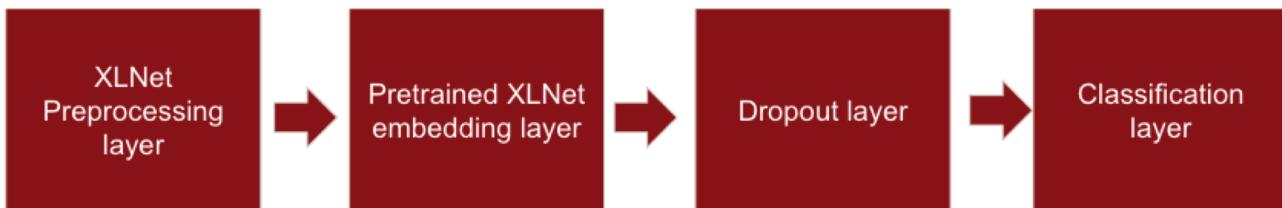
- Baseline model
- LSTM with Word2Vec



- BERT



- XLNet



Results and Conclusions

Scenario 1: Trained
on one type of crisis

Crisis type	AUC
Earthquakes	0.82
Floods	0.93
Derailments	0.90

Scenario 2: Trained on
multiple types of crisis

Crisis type	AUC
Earthquakes	0.86
Floods	0.92
Derailments	0.94

1. A fine-tuned implementation of XLNet achieved ~90% accuracy in classifying disaster-related tweets, outperforming other models, and potentially serving as a useful tool for relief efforts.
2. Training the models on additional tagged tweets could further improve classification accuracy.