Clickbait Classifier

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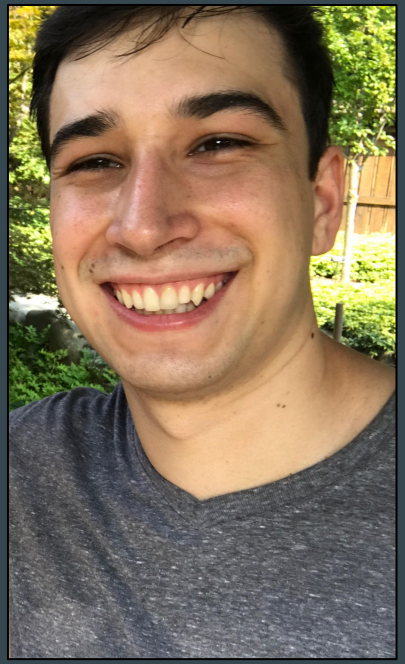


Clickbait Definition

Social media posts that are, at the expense of being informative and objective, designed to entice its readers into clicking an accompanying link

Our project classifies clickbait to combat social media's misleading exploitation of the user

Data Used

Data set of 19538 (4761 clickbait, 14777 not clickbait)

15,000 training 4,538 test Downloaded Data

Data Obtained

- Id
- Post Time Stamp
- Post Text
- Target Text
- Target Description
- Target Keywords
- Target Paragraphs
- Target Captions

Comparing approaches

X_{MC} Approach

- Define features
  - Number of words in title
  - Number of words in body text
  - If title is a question
  - Number of questions in title
  - Number of bait words
  - Bait word score of title
  - Number of context words in title
  - Context word score of title
  - Number of context words in body text
  - Context word score of body text
  - Pronoun score of title
  - Number of pronouns in title
  - Pronoun score of body text
  - Twitter handle in body text
  - If numbers are in title
  - Number of sentences in paragraph

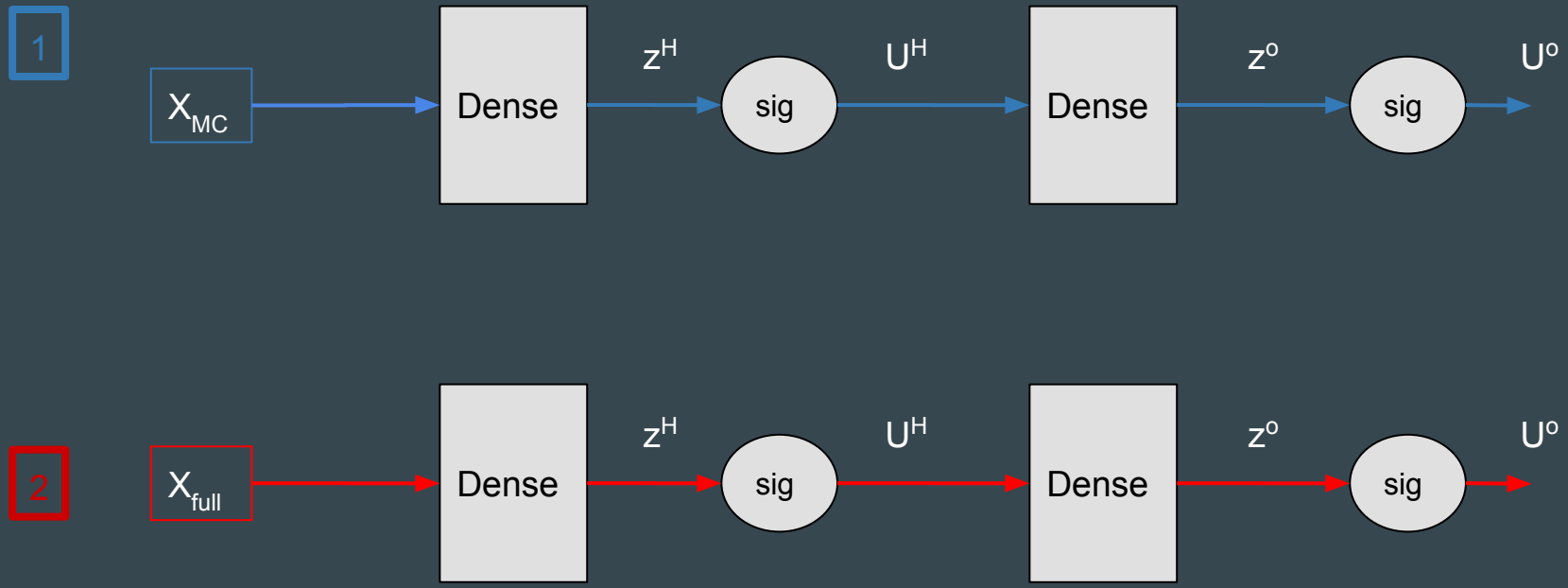
X_{Full} & X_{FULL} Text Processing Approach

- Assigns a numeric value to every character
- Run through a neural network
- Identify patterns
- Normalize all values in X_{FULL} between -1 to 1

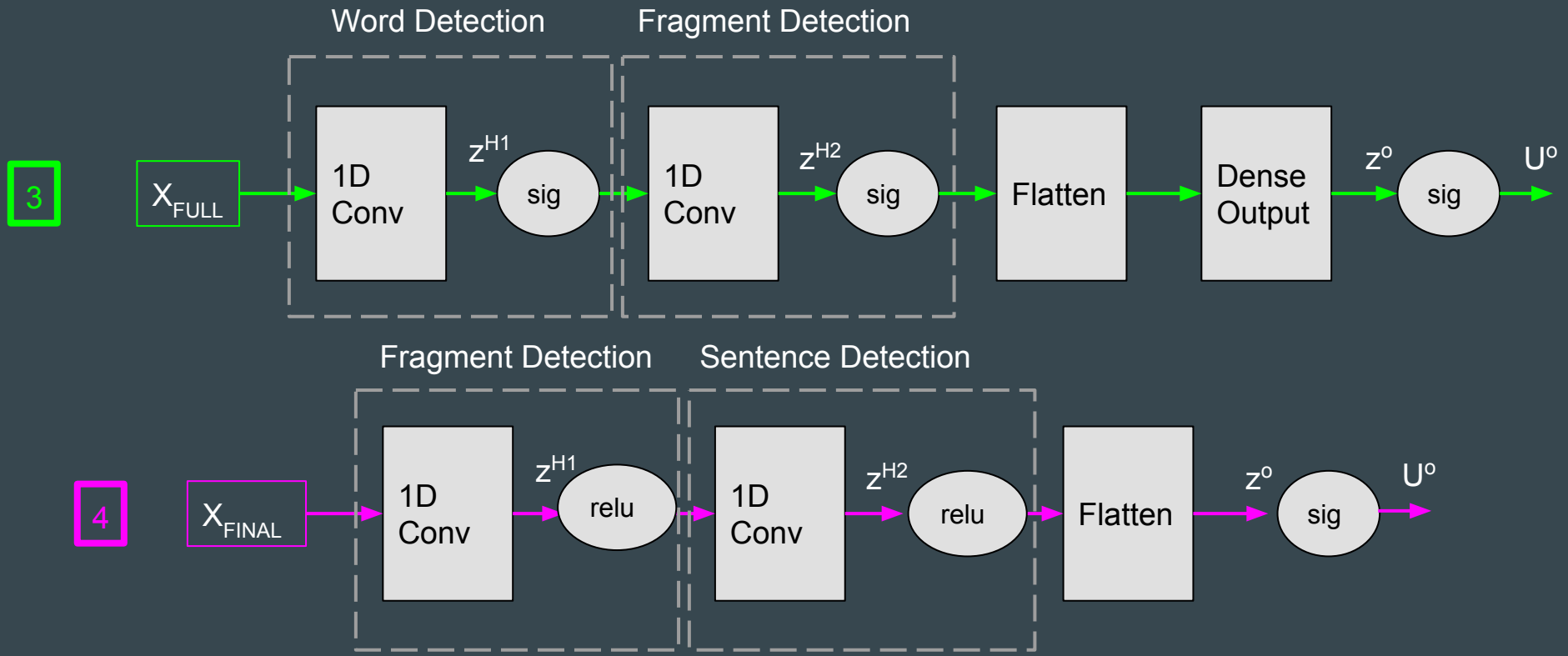
X_{FINAL} Text Processing Approach

- Numeric value is assigned to every unique word
- Cuts down number of features
- Convolutional neural network approach
- Normalize all values in X_{FINAL} between -1 to 1

Approach


1
X_{MC}
Dense
z^H
sig
U^H
Dense
z^o
sig
U^o
2
X_{full}
Dense
z^H
sig
U^H
Dense
z^o
sig
U^o

Final Approach



Shift Variant vs Invariant

Consider 2 sentence fragments:

You won't believe what happens next! **What happens next, you won't believe!**

Shift Variant System (Dense layer):

- Picks up "won't believe" in first sentence but not second
- Only able to filter entire sequence for word in one order

Shift Invariant System (Convolutional layer):

- Picks up "won't believe" in both sentences
- Treats sentence as a sequence, and is able to filter the entire sentence for a word or phrase

Results

1

- < 60% training and test accuracy
- Necessary for deeper set of features

2

- Training Accuracy: 97%
- Test Accuracy: 68%
- Overfitting
- Dense layer weights are not shift invariant
- Large local minimum at 76.34% training accuracy that optimizer must overcome

3

- Even with upsampling our minority class, issue with local minimum at ~50% training accuracy
- 1D Convolution is shift invariant
- New set of features is required to fully explore convolutional neural network

4

- Model fitting able to overcome local minimum, with upsampling, 250 epochs
- Simplified output layers
- Accuracy peaks:
  - Without dropout: Training 98.04%, Validation 76.53%
  - With dropout: Training 82.5%, Validation 72.3%
  - Validation kept up better with drop out, but would take more than 250 epochs to train

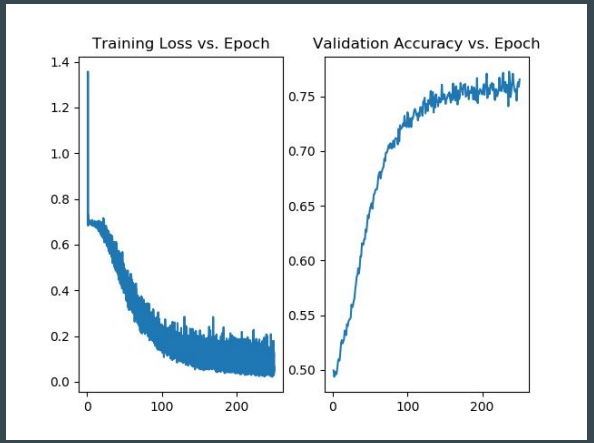
Results

4

Without Dropout:

Layer (type)	Output Shape	Param #
C1 (Conv1D)	(None, 219, 512)	8704
C2 (Conv1D)	(None, 204, 256)	2097408
flatten_1 (Flatten)	(None, 52224)	0
output (Dense)	(None, 1)	52225

Total params: 2,158,337
Trainable params: 2,158,337
Non-trainable params: 0



With Dropout:

Layer (type)	Output Shape	Param #
C1 (Conv1D)	(None, 219, 512)	8704
dropout_1 (Dropout)	(None, 219, 512)	0
C2 (Conv1D)	(None, 204, 256)	2097408
flatten_1 (Flatten)	(None, 52224)	0
dropout_2 (Dropout)	(None, 52224)	0
output (Dense)	(None, 1)	52225

Total params: 2,158,337
Trainable params: 2,158,337
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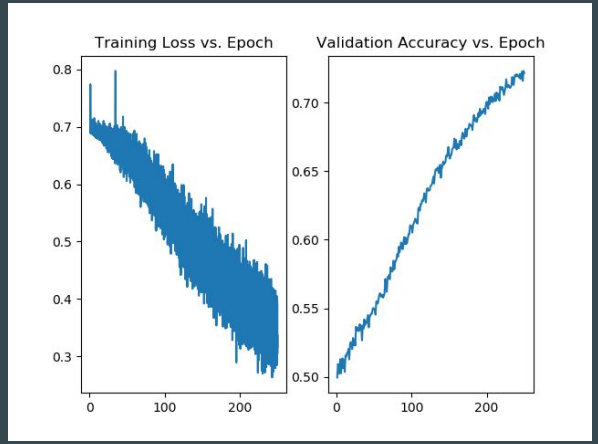

Resources

- Text Processing Techniques Used
- Keras Documentation
- Data and Challenge
- Our Code
- Sundeep Rangan