Tweets Sentiment Analysis Using LSTM Recurrent Neural Networks

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CS638

Why Sentiment Analysis?

- Help consumers gauge products.
- Help marketers find public opinion of of their company and products.

What defines a sentiment?

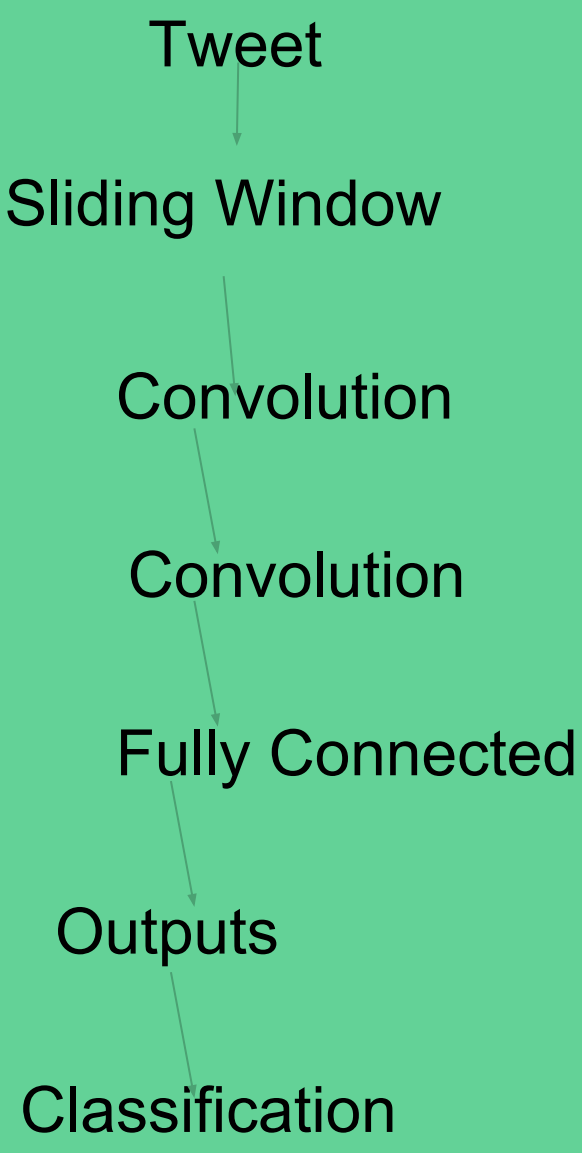
- “If the tweet could ever appear as a frontpage newspaper headline or as a sentence in Wikipedia, then it belongs in the neutral class.”

Our Data

Sentiment140

- 1,600,000 tweets.
- Each tweet is limited to 140 characters.
- Noisy Labels as emoticons.
- More frequent misspellings and slang.
- Lots of different domains.
- Neutral tweets taken out.

Our First Approach

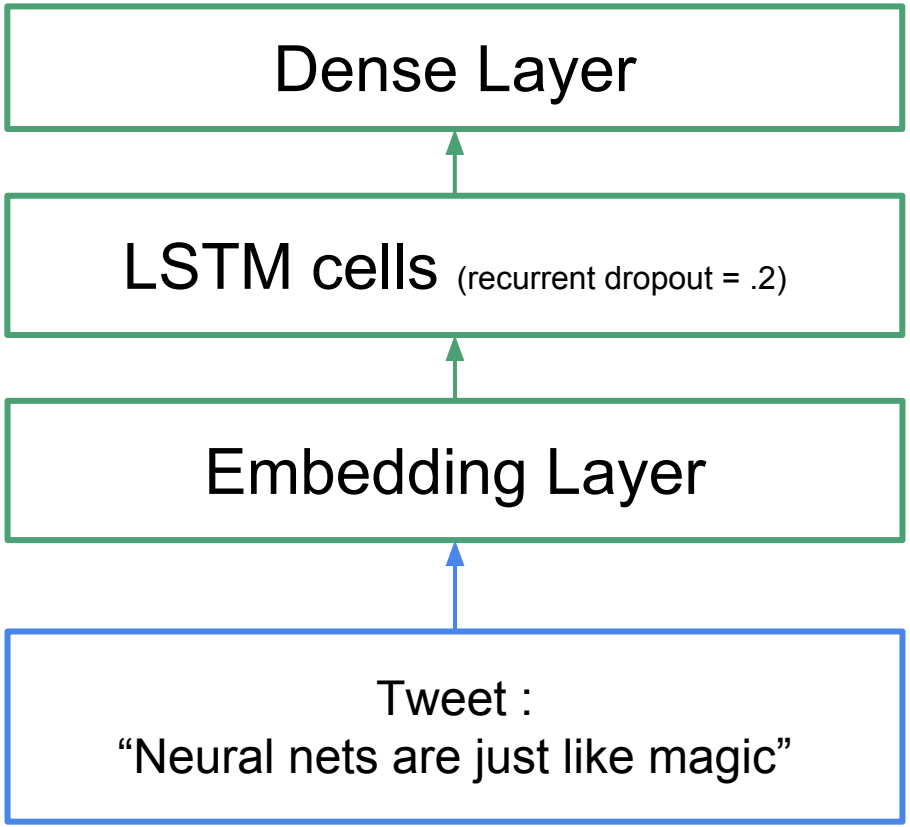


Our Current Approach

- Build a dictionary from the data set using word2vector as well as gensim.
- Concatenate those word vectors to construct a tweet.
- Feed into our Long Short-Term Memory (LSTM) network.

-- vary # of output units

-- vary # of memory cells



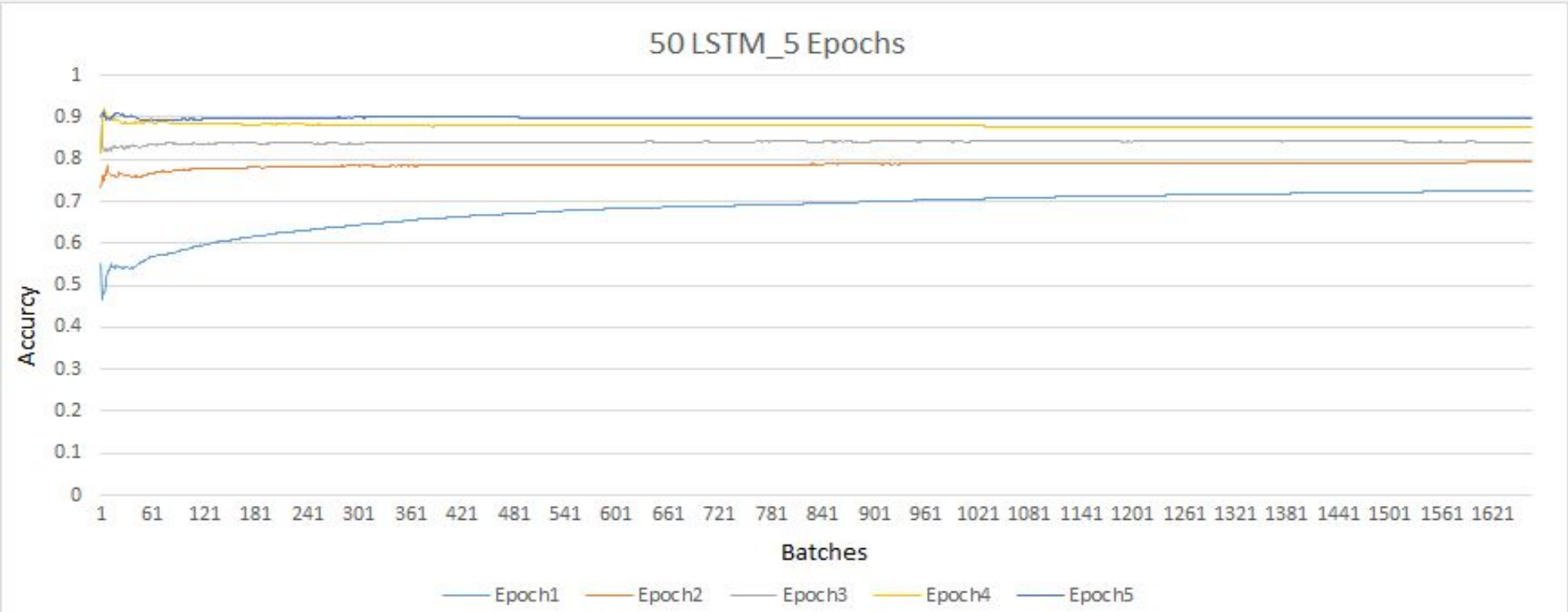
Results Thus Far

Best Model (with sampled data)

50 LSTM Memory Cells, 1 Dense Output Unit

Training (100000 examples): acc: 0.8967

Testing (2000 examples): acc: 0.7758



Moving Forward

- The cloud
- Feature reduction
- Time Steps window
- Different architecture

Feature Reduction

Elongated Words: ‘hunnnnngry’ > ‘hunngry’

Usernames: ‘@MarkWaid’ > ‘USERNAME’

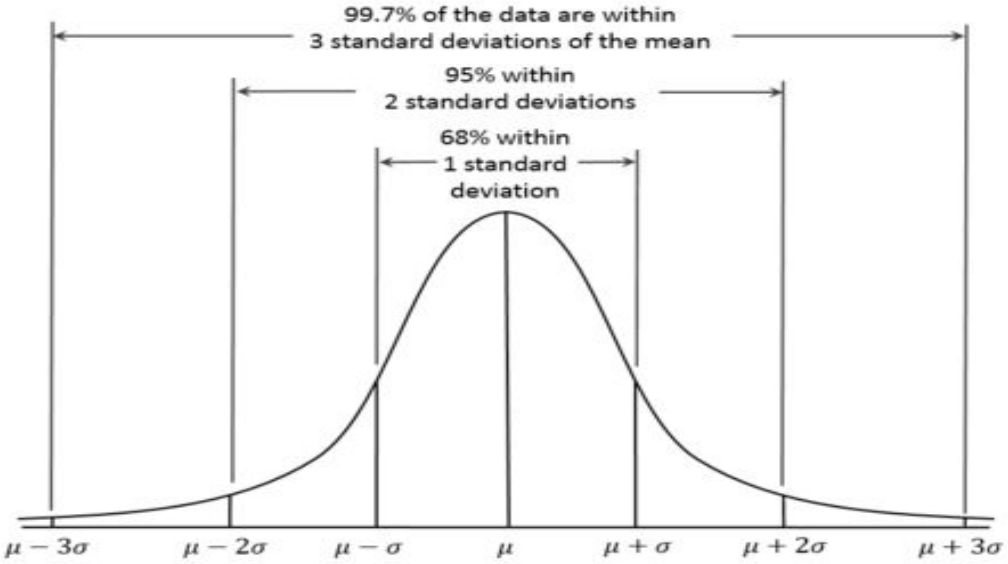
URLs: ‘http://blip.fm/~6iocx’ > ‘URL’

http://cs.stanford.edu/people/alecmgo/papers/TwitterDistantSupervision09.pdf

Time Steps Window

[<PADDING><PADDING><Neural><nets><are><just><like><magic><PADDING><PADDING>]

[<This><tweet><is><way><way><way><too><long><for><our>] <constant><time><step><value>



Questions / Suggestions ?

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