Stylistic Language Generator: Trump Bot

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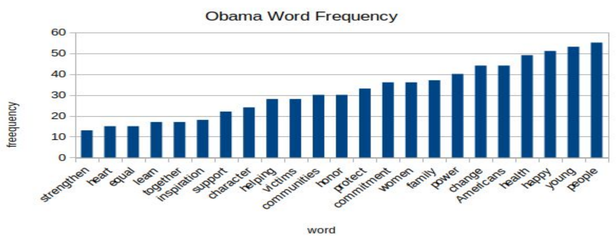
Motivation

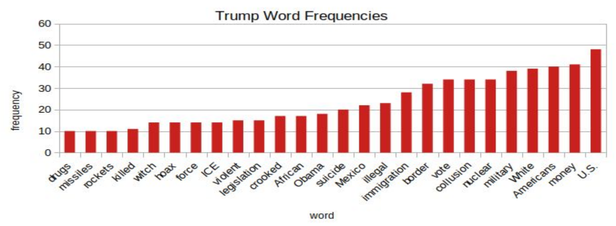
- We wanted to create a twitter bot that could effectively emulate the talking/posting style of the current president for satirical purposes in hopes that it might in some way relieve political tension/hostility as has been the case in the past with other satirical outlets.

Goals

- Train RNN and LTSM to tweet in a similar style to that of Donald Trump with hopes of easing political tension and easing political discourse via humorous take on the president's communication skills.

Data





Methodology (RNN vs LSTM)

- **RNN -** Extension of feedforward neural networks capable of handling variable length vectors by employing a hidden memory unit, *h,* that is updated with the weighted values over the current value of the input vector as well as the previous *h*.
  - h provided by

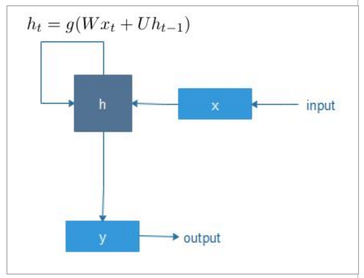
$$h_t = g(Wx_t + Uh_{t-1})$$

- **LSTM -** an extension of RNN in which the hidden memory unit is updated by partially forgetting some information and partially intaking new information in what is known as a cell state.
  - Memory cell state *c* is update by

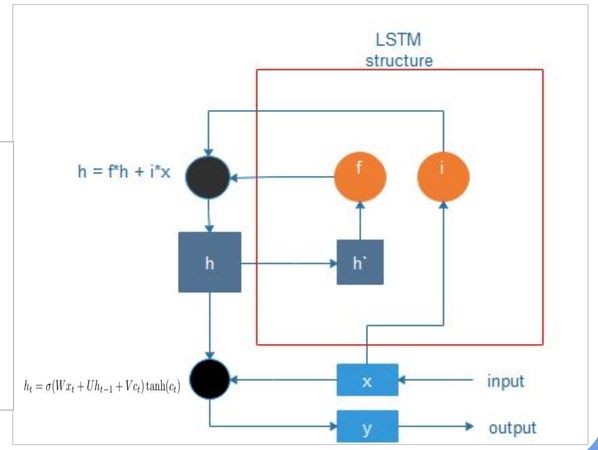
$$c_t = f_t c_{t-1} + i_t \tanh(W_c x_t + U h_{t-1})$$

- Both output probability distribution over sequence of variables
- The key difference being that in traditional RNN's, all previous memory is replaced by the new information, whereas LSTM "holds" onto memory over time.
- We had opted for using LSTM as holding memory for longer allows for more complex/longer patterns to be caught in the model.

RNN



LSTM RNN



Results and Evaluation

- Calculate accuracy of generated tweets using BLEU, or Bilingual Evaluation Understudy, score.
  - Corpus test would consist of file containing all tweets in original order.
- Cumulative N_gram score would be counted up to the length of the new sentence (i.e. N = 1, 2, …, length of sentence).

$$\text{BLEU} = \text{BP} \cdot \exp\left(\sum_{n=1}^{N} w_n \log p_n\right)$$

The cast and producers of Hamilton were not able to do the job of stopping people from leaving their country and coming illegally to Trump. Dems must approve Border Security & Wall NOW! Fools!

Collusion is not a crime, but that doesn't matter because there was No Collusion (except by Crooked Hillary and the Democrats)!

Just announced that Congress talks about my hair but I'm not allowed to talk about its ugly face or body. It is trying hard to disguise its massive Muslim problem. Slimeball!

Discussion:

- Using a LSTM model for natural language generation, we emulated President Trump and Obama, in an attempt to capture tone/style on Twitter
- Important aspect with regards to emulating writing style involves tuning *f* and *i* to adjust how much is remembered and learned at every step
- We would have liked to expand our model to encompass the ability to respond to other people using RNN for

Reference

- https://github.com/bpb27/trump-tweet-archive/tree/master/data/realdonaldtrump
- https://factba.se/transcripts