FAKE NEWS – CHALLENGES

Presented by :- Archita Pathak
Answers

- Why only classification algorithm not good?
- Why only network analysis not good?
- How Fake News community works?
- My approach?
What is fake news?

- According to Trump
What is fake news?

- According to Democrats

![Cartoon image](image-url)
What is fake news?

- According to General Public
What is fake news?

- Pew Survey 2017 – 64% US adults said great deal of confusion about the facts in current events.

Fig - 1: Google Trend for worldwide usage of “fake news” term from 2004 to present time
First Challenge - Definition

- Wardle and Derakshan (2017)

Fig - 2: Conceptual framework for examining information disorder taken from Information Disorder: Toward an interdisciplinary framework For research and policy making (Sept, 2017)
Definition – European Commission

“Verifiably false or misleading information that is created, presented and disseminated for economic gain or to intentionally deceive the public, and in any event to cause public harm”

- Verify information – doable (Google search)
- Check if written for economic gain – doable (ads)
- Intentionally deceiving – doable (history of account)
- Confirm that it will incite violence – doable to some extent
  - Separate research area
Second Challenge – Freedom of expression

- Can you stop someone from writing or publishing the articles?
- Can you stop someone from expressing their opinions?
- Can you stop someone from reading or sharing any article?
- Not in a democratic country

“Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.”

-First Amendment, December 1791
Second Challenge – Freedom of expression

- EU Survey (13 November 2017 to 23 February 2018)
  - Regardless of the type of action proposed, all respondents unanimously agreed on the **need to respect and guarantee overarching fundamental rights** such as freedom of expression and to **ensure that any approach used to tackle fake news should not promote any kind of direct or indirect censorship.**
Confirmation Bias:
- Social media algorithms are designed in a way such that they feed us with stuffs that are related to what we surf online.
- People who don’t know how this recommendation system works, get influenced by the suggestions on their feeds believing their opinions to be popular and true.
- Thus, people share those articles which conform to their bias.
Third Challenge – Fast Dissemination

- The **number of clicks** and links these websites get are really fast which help them to skyrocket on top of search results.

- Clicks bot based or human based?

- MIT study of 2018 stated that “falsehoods were 70% more likely to get retweeted than accurate news”
  - *Humans involved in sharing*

- Stanford’s list of popular fake news articles during 2016 US elections.

- All of them shared same articles with same headlines

- 90% of the domains are now shut down
  - *Used trial version of domain providers*

- All of them had 100s of thousands of FB followers each

- Running fake news websites have **verified** YouTube and Twitter accounts
Third Challenge – Fast Dissemination

- To rank higher on the search results, propagandist sites make use of “keyword stuffing” and “algorithm friendly headlines”
- Algorithms exist to suppress the dissemination
  - [https://www.youtube.com/watch?v=4PAduZeqLTY](https://www.youtube.com/watch?v=4PAduZeqLTY)
- They are monitoring us, hence only doing network analysis will not help
- USA election next year, this trend may repeat again.
Fourth Challenge – What should we do?

- You can NOT stop the creation of accounts
- You can NOT censor anyone
- You can NOT incriminate anyone for sharing false news
- You can NOT stop anyone from sharing false news

- However, you CAN plant a seed of doubt in the reader’s mind
- Look at the content
- Learn writing style – possible?
Examples of popular fake news headlines

- WikiLeaks CONFIRMS Hillary Sold Weapons to ISIS... Then Drops Another BOMBSHELL! Breaking News
- Hillary Clinton Wore Secret Earpiece During First Presidential Debate?
- President Obama Confirms He Will Refuse to Leave Office If Trump Is Elected
- FBI director received millions from Clinton Foundation, his brother’s law firm does Clinton’s taxes
Learning Orthographic and Morphological Features
## Learning Orthographic and Morphological Features

<table>
<thead>
<tr>
<th>Models</th>
<th>Accuracy</th>
<th>Precision</th>
<th>Recall</th>
<th>F1 score</th>
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<tbody>
<tr>
<td>BiGRU using Char Embedding on Content</td>
<td>0.9888</td>
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<td>Using NLP and SVM (Rosas et al., 2017)</td>
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<td>Using Topic Based Feature Set (Bag of words approach) (Potthast et al., 2017)</td>
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<td>Stylometric Approach (Potthast et al., 2017)</td>
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</tbody>
</table>
BiGRU Vs BiLSTM

- Both have gating mechanisms and have ability to learn past and present data.
- Bi-Directional gives it ability to learn future data as well at the same time.
- Only difference between GRU and LSTM is number of gates.
- Gates make sure how much amount of data should be forwarded to next recurrent unit
- This makes LSTM to have ability to learn longer sentences.
- In this implementation, LSTM and GRU have 128 units in each of the layers.
Word Embedding Vs Character Embedding

Char Emb (CE) Vs Word Emb (WE) on Content

Char Emb (CE) Vs Word Emb (WE) on Headline
Is it enough?

Threatened with black magic, doctor ‘duped’ of Rs 72,000

Police Find Satanic Ritual Dungeon in Chuck E. Cheese Basement

Woman leaves dogs in car; dogs crash it into Walmart
Fourth Challenge – What should we do?

- You can NOT stop the creation of accounts
- You can NOT censor anyone
- You can NOT incriminate anyone for sharing false news
- You can NOT stop anyone from sharing false news

- However, you CAN plant a seed of doubt in the reader’s mind
- Look at the content
- Learn writing style – possible?
- Verify claims – possible?
- Learn intuition – possible?
Examples of popular fake news headlines

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Final Challenge - Dataset

- Lack of clean and structured dataset
- Anomalies such as blog posts tagged as fake
- All articles should belong to same time period
- All articles should not contain any gibberish
- Fake articles should be derived from trusted sources like Snopes, PolitiFacts etc.