studying misinformation on Twitter with data viz + natural language processing

or, how I built this dashboard without writing a single line of JavaScript

20191022

@mathemakitten

hi hello i’m helen

- mostly machine learning
- interests in language models and misinformation
- Python 

whalefakes
@whalefakes

yeah do you realize that at least one whale is on drugs

10:21 PM · Jul 9, 2019 · Twitter Web Client

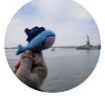
4 Retweets **28** Likes

whalefakes
@whalefakes

there are no laws that say a humpback whale cannot drive

7:18 PM · Aug 20, 2019 · TweetDeck

2 Retweets **6** Likes



whalefakes
@whalefakes

from a scientific standpoint, there is no such thing as the fuckin prince of whales

9:15 PM · Jul 14, 2019 · TweetDeck

2 Retweets **14** Likes

other things i am

- terrible at JavaScript
- honestly i’m amazed that the internet even works

what I wanted to do at RC

- study misinformation on Twitter
- with data from the Twitter Elections Integrity Hub
- study information operations directed at Hong Kong

a problem

- can we predict when an account transforms into a propaganda-related account?
  - **spoiler**: it’s really hard

the goals

- make this data accessible for everyone
- raise awareness about Twitter misinformation campaigns
- simplify my life while conducting exploratory data analysis for natural language tasks

Classic Dashboard

Creatively crafted Dashboard for your needs

$ 72548	72548	2548	1548
TOTAL PROFIT	ACTIVE USERS	NEW ORDERS	NEW COMMENTS
Monthly progress	Monthly progress	Monthly progress	Monthly progress

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Monthly progress	Monthly progress	Monthly progress	Monthly progress

Production February 2017

Export Print

Production February 2017

Export Print

helen
@mathemakitten

hello, i am a machine learning dev who just spent four hours struggling with (what seems to be??) the deep end of data viz/d3/JavaScript and i have a WHOLE NEW APPRECIATION for front-end complexity

i will now proceed to navigate the web with a newfound sense of awe✨

7:36 PM · Sep 28, 2019 · Twitter Web App

View Tweet activity

19 Likes

demo

some tools used

- wrapper on JavaScript + D3.js

- wrapper on React

- natural language processing library for entity detection and lots of other fun stuff

- machine learning library
  - including prebuilt language models

things i learned a non-comprehensive account

- it’s expensive to deploy a webapp which requires 7GB of startup memory with Heroku or Google App Engine
- **what I did instead**: host the dashboard myself on Google Cloud Platform with Flask (a web framework), gunicorn (a web server) & nginx (a reverse proxy)

more things i learned

- lots of NLP has been built on top of English corpuses
  - which is fine, until you need to do things in not-English
- NLP on spam is hard

stuff which didn't work

- encoding tweets from lots of languages with the Tensorflow Multilingual Universal Sentence Encoder and then clustering them for topic modeling
  - **spoiler**: it just learns to separate tweets by their original language

more stuff which didn't work

- entity detection on non-English tweets
- trying to translate 10M tweets from various languages with the Google Translate API

(languages are hard)

things I still don’t know

- how to write any JavaScript
- how the internet works

stuff still in progress

- predicting the timestep at which an account starts being propaganda-related
  - sub-problem: figuring out what to do with the large amount of non-English tweets in an account history

thank you

@mathemakitten

@whalefakes