Interactive Dashboard for Text Label Exploration

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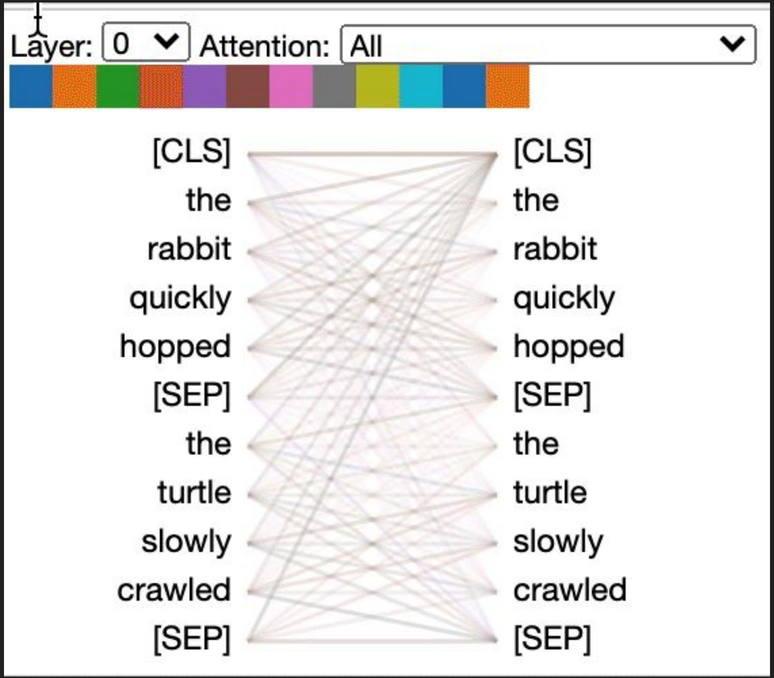
Motivation

- Labeling is necessary for many supervised tasks. It is typically a **manual** yet **erroneous** labour.
- Automated labeling is limited by the black box nature of models. They are models specific, have static visualization, or not scalabile for complex tasks.



Layer: 0 Attention: All

https://github.com/jessevig/bertviz

Dataset

- Confusing or overlapping labels are hard to label, even for humans
- Labels in our dataset are:
  - Conspiracy
  - Controversy
  - Misconception
  - Fact
  - Fiction
  - Stereotype

Examples

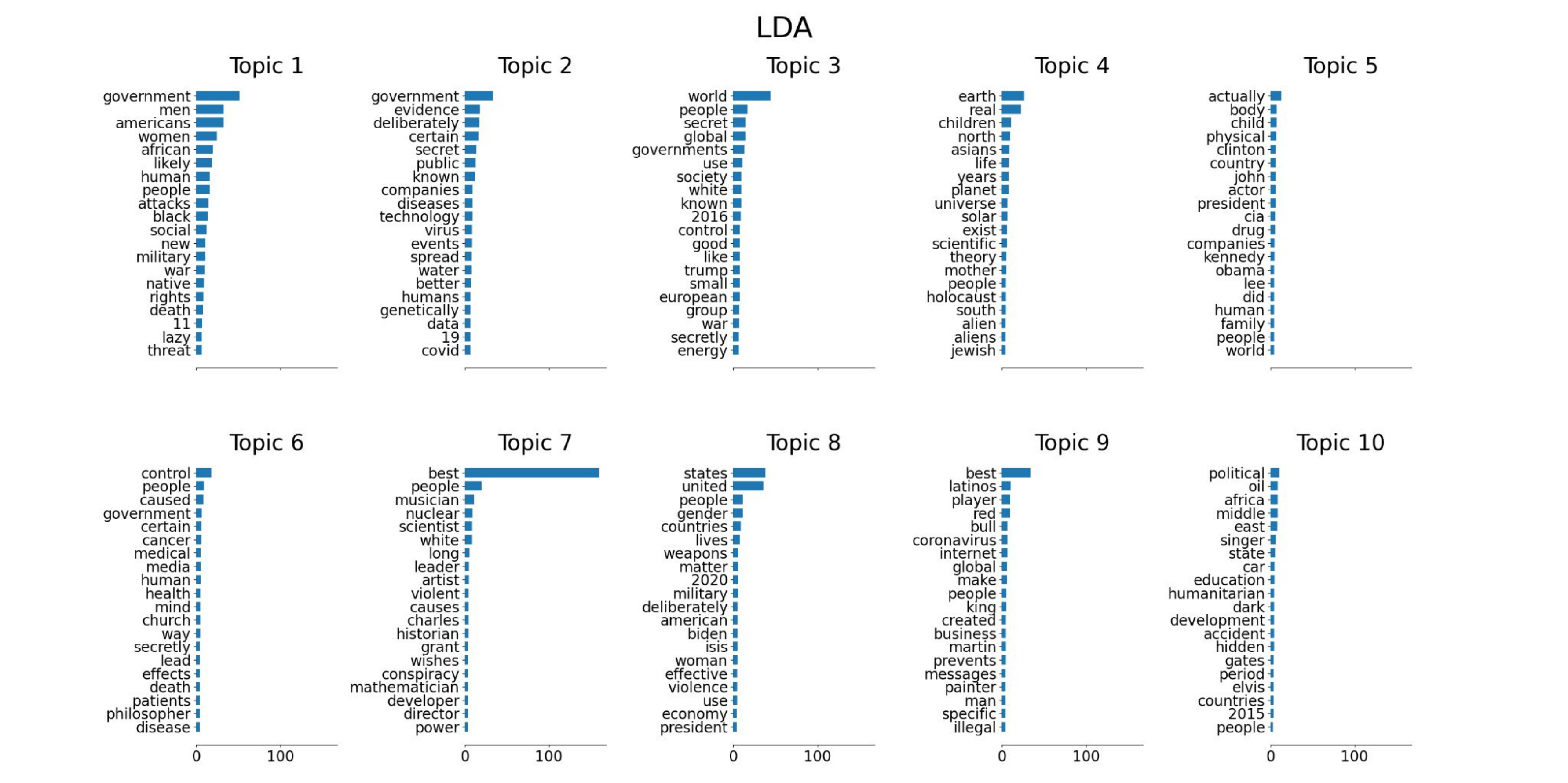
- Eskimos do have a disproportionate number of words representing snow in their languages.
  - Misconception of Controversy?
  - Requires deeper knowledge of topic to correctly identify if it is a debatable topic (controversy) or is widely believed but wrong (misconception)
- Water condensation trails ("contrails") from aircraft consist of chemical or biological agents under secret government policies
  - Conspiracy? Spread deliberately by <u>one group</u> against another?
  - Controversy? Just a belief held by <u>significant number</u> of people?

Solution

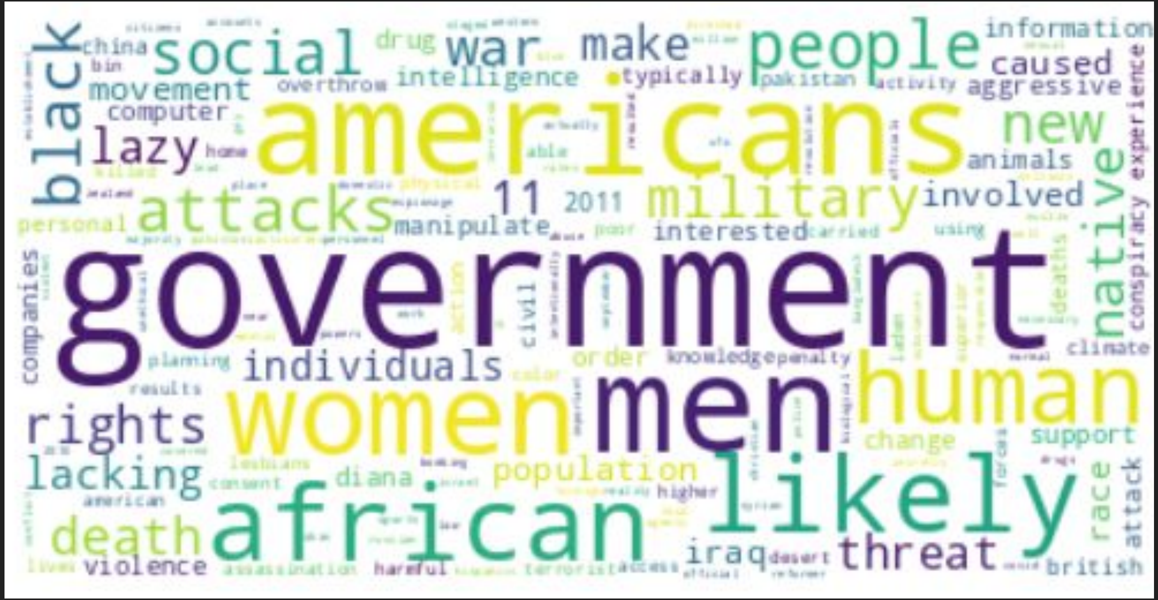
- Visualize natural clusters in text labels
- Find topics in samples and see how they correlate with the existing labels
- Find semantically similar samples

Methodology (Demo)

- Find embedding of each sample.
  - Doc2Vec, Universal Sentence Encoding, BERT encoding, …..
- Visualize natural clusters in data. Find suitable labels, or errors in existing labels.
  - PCA, T-SNE, ….
- Visualize data by topic by performing topic modeling.
  - NMF, LDA
  - Show topic words and topic word cloud for each sample
- Show top-n nearest samples for each data point
  - To help find outliers or perform semantic de-duplication


LDA
Topic 1
government
men
americans
women
african
likely
human
people
attacks
black
social
new
military
war
native
rights
death
11
lazy
threat
Topic 2
government
evidence
deliberately
certain
secret
public
known
companies
diseases
technology
virus
events
spread
water
better
humans
genetically
data
19
covid
Topic 3
world
people
secret
global
governments
use
society
white
known
2016
control
good
like
trump
small
european
group
war
secretly
energy
Topic 4
earth
real
children
north
asians
life
years
planet
universe
solar
exist
scientific
theory
mother
people
holocaust
south
alien
aliens
jewish
Topic 5
actually
body
child
physical
clinton
country
john
actor
president
cia
drug
companies
kennedy
obama
lee
did
human
family
people
world
Topic 6
control
people
caused
government
certain
cancer
medical
media
human
health
mind
church
way
secretly
lead
effects
death
patients
philosopher
disease
0
100
Topic 7
best
people
musician
nuclear
scientist
white
long
leader
artist
violent
causes
charles
historian
grant
wishes
conspiracy
mathematician
developer
director
power
0
100
Topic 8
states
united
people
gender
countries
lives
weapons
matter
2020
military
deliberately
american
biden
isis
woman
effective
violence
use
economy
president
0
100
Topic 9
best
latinos
player
red
bull
coronavirus
internet
global
make
people
king
created
business
martin
prevents
messages
painter
man
specific
illegal
0
100
Topic 10
political
oil
africa
middle
east
singer
state
car
education
humanitarian
dark
development
accident
hidden
gates
period
elvis
countries
2015
people
0
100

LDA Topic 1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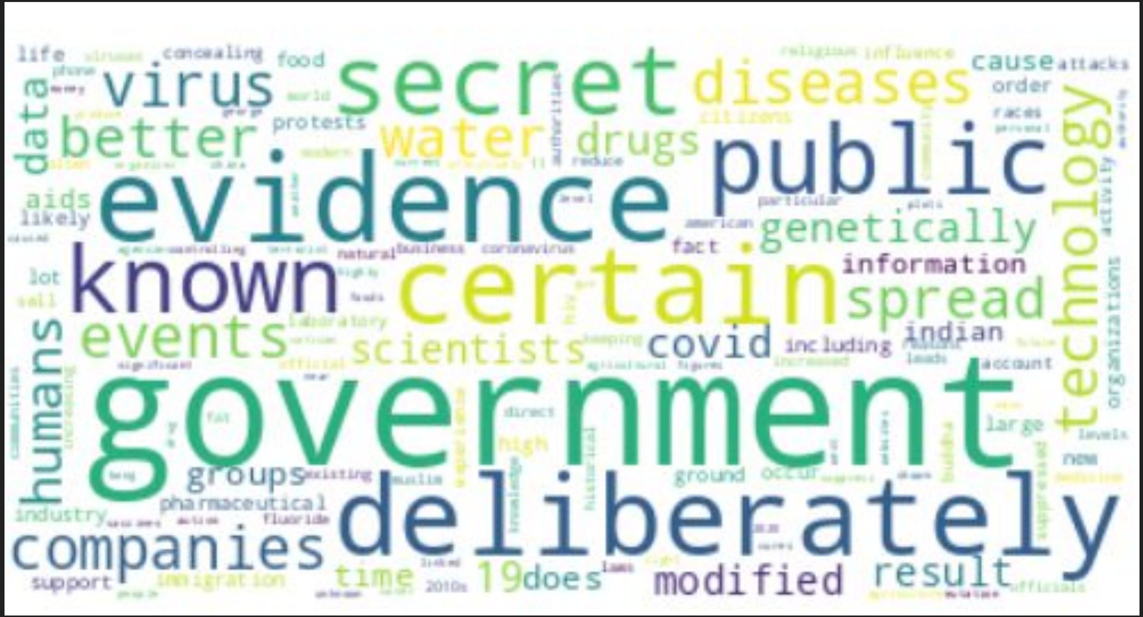
china
bin
drug
overthrow
intelligence
typically
pakistan
activity
information
caused
aggressive
animals
involved
11
2011
personal
manipulate
interested
carried
using
companies
civil
order
knowledge
penalty
deaths
conspiracy
experience
climate
support
change
race
attack
forces
lesbians
consent
diana
higher
iraq
desert
british
violence
assassination
harmful
terrorist
access
results
planning
american
color
physical
home
able
killed

LDA Topic 2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