

Research on Computational Fact-Checking and Knowledge Graphs

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Misinformation and “Fake News”

The creation and propagation of misinformation (colloquially known as “fake news”) has become an increasingly important issue for our society to tackle.



Image from <https://bit.ly/2P4tTQf>

Fake news cost the world economy **\$78 billion** in 2019

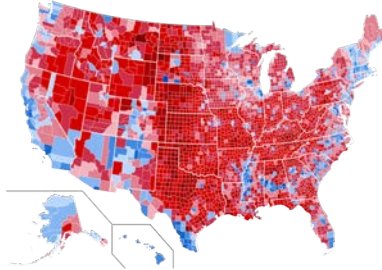


Image from <https://bit.ly/3bPO1ze>

>38 million reshares of misinformed articles during 2016 Presidential Election



Image from <https://bit.ly/39MgnZj>

68% of Americans say that misinformation hurts their belief in government



Americans on the level of confusion caused by misinformation

Study from Pew Research Center
(<https://pewrsr.ch/39PmGeP>)

The Fact-Checking Process

Fact-checkers: Washington Post, PolitiFact, FactCheck.org, New York Times,

However, fact-checkers cannot keep up with the explosive spread of misinformation

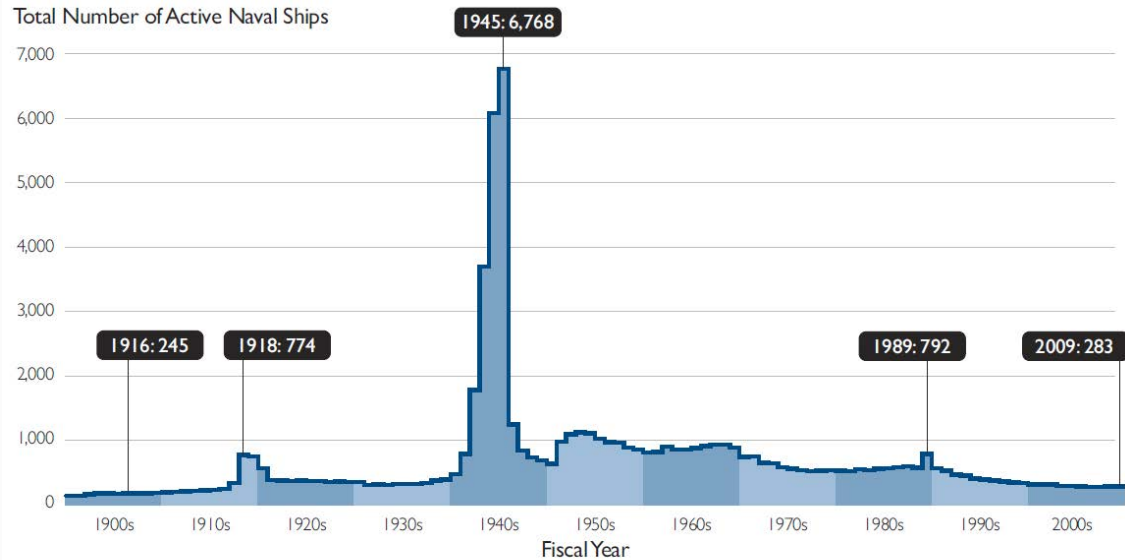
- Human fact-checkers spend **between 4 hours and 1 day** to check *one* claim (Duke Reporters' Lab)
- **800 million** tweets (30% retweets) posted per day, each potentially with false information

Fact-checking is Hard

“... our Navy is smaller than it's been since 1917”, said Republican candidate Mitt Romney in third presidential debate in 2012.



U.S. Navy Has Smallest Number of Ships Since 1916



Source: U.S. Navy, Active Ship Force Levels, 2009, at <http://www.history.navy.mil/branches/org9-4.htm> (December 6, 2009).

http://en.wikipedia.org/wiki/Mitt_Romney

http://s3.amazonaws.com/thf_media/2010/pdf/Military_chartbook.pdf

Fact-checking is Hard

“... our Navy is smaller than it's been since 1917”, said Republican candidate Mitt Romney in a Republican presidential debate in 2012.



The U.S. military is at risk of losing its "military superiority" because "our Navy is smaller than it's been since 1917. Our Air Force is smaller and older than any time since 1947."

— Mitt Romney on Monday, January 16th, 2012 in a Republican presidential debate in Myrtle Beach, S.C.



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VS



http://en.wikipedia.org/wiki/Mitt_Romney

http://s3.amazonaws.com/thf_media/2010/pdf/Military_chartbook.pdf

http://en.wikipedia.org/wiki/United_States_Navy



Toward the Holy Grail of Automated Fact-checking

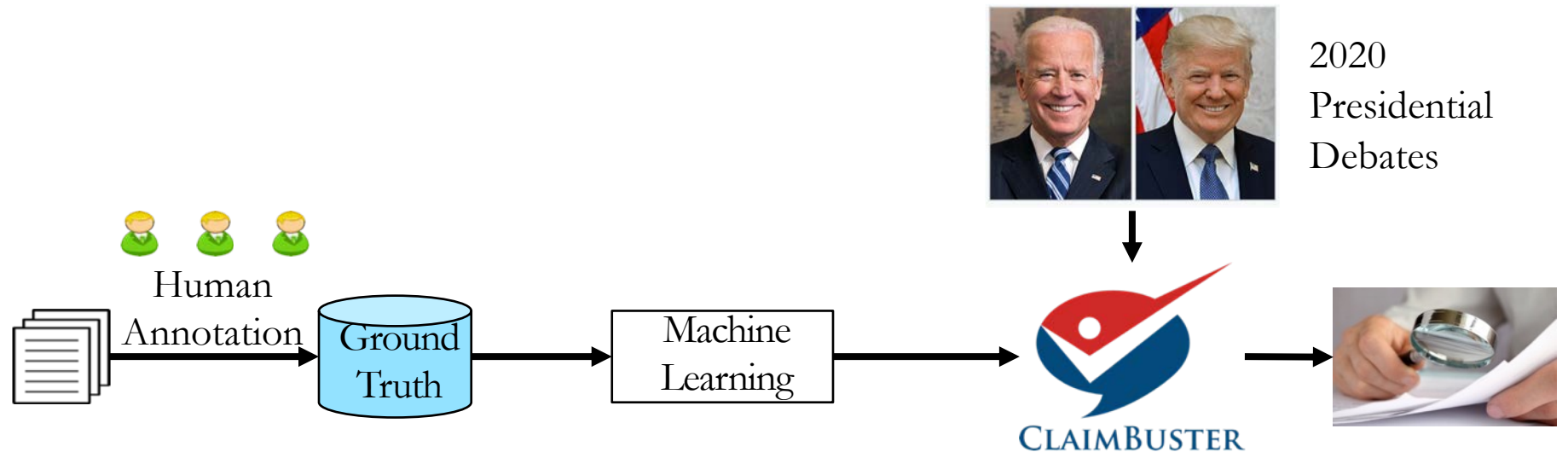
idir.uta.edu/claimbuster



PolitiFact "Buffet" of Factual Claims

	A	B	C	D	E
1	Statement	Speaker	Date	Location/Source	Link
232	I haven't heard one (republican) say that they're in	o'malley	4/20/2015	morning edition	http://www.npr.org/blogs/its
233	concentrated wealth and capital have been put into	o'malley	4/20/2015	morning edition	http://www.npr.org/blogs/its
234	it is not true that regulation holds poor people down or	o'malley	4/20/2015	morning edition	http://www.npr.org/blogs/its
235	Every three weeks we bring online as much as solar	Obama	4/18/2015	Weekly address	https://www.whitehouse.gov
236	Our carbon polution has fallen by 10 percent since	Obama	4/19/2015	Weekly address	https://www.whitehouse.gov
237	"Benghazi has had more hearings, more documents	Claire McCaskill	4/19/2015	ABC this week	http://thehill.com/policy/inte
238	With fast track trade " I would be receiving the same	Obama	4/17/2015	remarks joint press	https://www.whitehouse.gov
239	Loretta Lynch "has been now sitting there longer than	Obama	4/17/2015	remarks joint press	https://www.whitehouse.gov
240	I just counted 19 Republicans who are likely to run for	chris cillizza	4/20/2015	the twitters	https://twitter.com/TheFix/st
241	He [Rand Paul] wanted to cut all our defense	John McCain	4/20/2015	Fox News	https://www.youtube.com/w

Finding Important Factual Claims: A Supervised Learning Task



Presidential Debate Transcripts

- All 33 presidential debates from 12 general elections in history: 1960, 1976—2016.
- 23,533 sentences by presidential candidates after removing 2,789 very short (< 5 words) sentences.

Classification and Ranking by Check-worthiness

CFS: Important factual claims

"We spend less on the military today than at any time in our history."

"The President's position on gay marriage has changed."

"More people are unemployed today than four years ago."

UFS: Unimportant factual claims

"I was in Iowa yesterday."

"My mother enjoys cooking."

"I ran for President once before."

NFS: No factual claims (opinions, questions & declarations)

"Iran must not get nuclear weapons." "7% unemployment is too high." "My opponent is wishy-washy." "I will be tough on crime." "Why should we do that?" "Hello, New Hampshire!" "Our plan is to reduce tax rate by 10%."

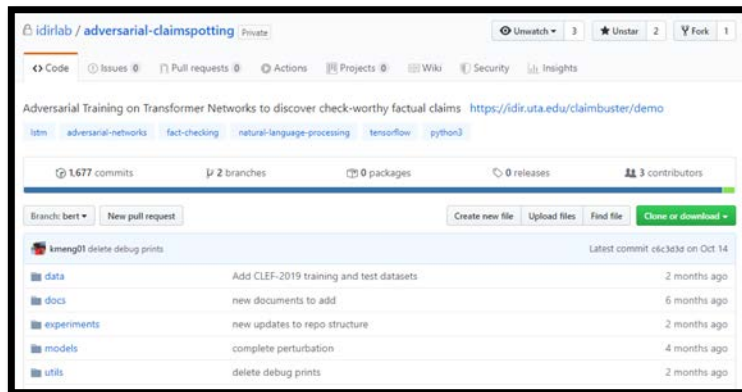
ClaimBuster API and Code Repository



idir.uta.edu/claimbuster/api/



github.com/idirlab/claimspotter







11th 2020 Democratic Party Primary Debate. March 15, 2020, 8 p.m. ET

Participants: Joe Biden, Bernard Sanders

Moderators: Jake Tapper, Dana Bash, Ilia Calderon, Unidentified Voice



10th 2020 Democratic Party Primary Debate. Feb 25, 2020, 8 p.m. ET

Participants: Pete Buttigieg, Bernard Sanders, Amy Klobuchar, Elizabeth Warren, Michael Bloomberg, Joe Biden, Tom Steyer

Moderators: Unidentified Voice, Norah O'Donnell, Gayle King, Bill Whitaker, Major Garrett, Margaret Brennan



9th 2020 Democratic Party Primary Debate. Feb 19, 2020, 9 p.m. ET

Participants: Bernard Sanders, Elizabeth Warren, Michael Bloomberg, Pete Buttigieg, Amy Klobuchar, Joe Biden

Moderators: Lester Holt, Hallie Jackson, Chuck Todd, Vanessa Hauc, Jon Ralston



8th 2020 Democratic Party Primary Debate. February 7, 2020, 8 p.m. ET

Participants: Joe Biden, Bernard Sanders, Amy Klobuchar, Tom Steyer, Andrew Yang, Elizabeth Warren, Pete Buttigieg

Moderators: George Stephanopoulos, Unidentified Voice, Linsey Davis, David Muir, Monica Hernandez, Adam Sexton



7th 2020 Democratic Party Primary Debate. Jan 14, 2020, 9 p.m. ET

Participants: Bernard Sanders, Joe Biden, Amy Klobuchar, Pete Buttigieg, Elizabeth Warren, Tom Steyer

Moderators: Wolf Blitzer, Abby Phillip, Brianne Pfannenstiel



6th 2020 Democratic Party Primary Debate. Dec 19, 2019, 8 p.m. ET

Participants: Pete Buttigieg, Amy Klobuchar, Elizabeth Warren, Bernard Sanders, Joe Biden, Andrew Yang, Tom Steyer

Moderators: Judy Woodruff, Unidentified Voice, Tim Alberta, Amna Nawaz, Yamiche Alcindor



5th 2020 Democratic Party Primary Debate. Nov 20, 2019, 9 p.m. ET

Participants: Elizabeth Warren, Amy Klobuchar, Bernard Sanders, Pete Buttigieg, Joe Biden, Kamala Harris, Cory Booker, Tulsi Gabbard, Tom Steyer, Andrew Yang

Moderators: Rachel Maddow, Andrea Mitchell, Kristen Welker, Ashely Parker

This Washington Post fact check was chosen by a bot

BY DANIEL FUNKE · JANUARY 30, 2018



Duke Reporters' Lab uses ClaimBuster API in creating daily newsletters that recommend to The Washington Post, New York Times, PolitiFact, and other fact-checkers the most check-worthy claims in CNN programs, Tweets, Facebook posts, and the Congressional Record.

"There were 10 million people that would have been on some path to staying in this country for indefinitely in the proposal that [Sens.] Dick Durbin and Lindsey Graham put forward."

— Former senator Rick Santorum (R-Pa.), in remarks on CNN's "State of the Union," Jan. 21, 2018

"I had actually looked at that transcript but I missed that claim," said Glenn Kessler, who runs The Fact Checker. "So it would have been lost to history if it had not been for ClaimBuster."

From the Congressional Record

Statements by members of the House and Senate as officially transcribed from floor speeches and debates.

Speaker	Claim	Chamber	Link
Mr. REED	On June 4, 1919, citizens of Tioga County joined together and signed a charter to create the Owego Chamber of Commerce.	House	Link
Ms. ESCOBAR	According to Mr. Bradford's son, for more than 30 days, Mr. Bradford avoided capture and eventually was able to find his way back to the American forces.	House	Link
Ms. ESCOBAR	Madam Speaker, I rise today to honor the life of an American hero, Bloyce Bradford, who passed away at 90 years old on Tuesday, January 29, 2019.	House	Link
Ms. ESCOBAR	While in Korea, Mr. Bradford was wounded multiple times and, at one point, was considered missing in action.	House	Link
The PRESIDING OFFICER	The senior assistant legislative clerk read the following letter: U.S. Senate, President pro tempore, Washington, DC, February 15, 2019.	Senate	Link
Mr. REED	Given the above, I ask that this Legislative Body pause in its deliberations and join me to celebrate the Tioga County Chamber of Commerce's one hundred years of service.	House	Link
The PRESIDING OFFICER	To the Senate: Under the provisions of rule I, paragraph 3, of the Standing Rules of the Senate, I hereby appoint the Honorable Ben Sasse, a Senator from the State of Nebraska, to perform the duties of the Chair.	Senate	Link
Mr. REED	The business show brings new businesses in, existing businesses together, putting them in contact with each other and the general public.	House	Link
Mr. REED	By purchasing properties and then improving those properties, the Chamber helped to create environments that welcomed new businesses.	House	Link
Ms. ESCOBAR	His legacy lives on through his sister Gwendolyn, his five children and their families, as well as his companion of 43 years and her family.	House	Link
Mr. REED	During World War II, the Chamber assisted with the selling of war bonds to aid in the war effort.	House	Link
Ms. ESCOBAR	He went on to enroll in the Army, where he served during the Korean War.	House	Link
Mr. REED	The Owego Chamber of Commerce manages the management of real estate.	House	Link
Mr. REED	I congratulate the Tioga County Chamber of Commerce for supporting businesses in our community.	House	Link
The PRESIDING OFFICER	Mr. SASSE thereupon assumes the Chair.	Senate	Link

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234	it is not true that regulation holds poor people down or	o'malley	4/20/2015	morning edition	http://www.npr.org/blogs/its
235	Every three weeks we bring online as much as solar	Obama	4/18/2015	Weekly address	https://www.whitehouse.gov
236	Our carbon pollution has fallen by 10 percent since	Obama	4/19/2015	Weekly address	https://www.whitehouse.gov
237	"Benghazi has had more hearings, more documents	Claire McCaskill	4/19/2015	ABC this week	http://thehill.com/policy/international
238	With fast track trade "I would be receiving the same	Obama	4/17/2015	remarks joint press	https://www.whitehouse.gov
239	Loretta Lynch "has been now sitting there longer than	Obama	4/17/2015	remarks joint press	https://www.whitehouse.gov
240	I just counted 19 Republicans who are likely to run for	chris cillizza	4/20/2015	the twitters	https://twitter.com/TheFix/st
241	He [Rand Paul] wanted to cut all our defense	John McCain	4/20/2015	Fox News	https://www.youtube.com/w

ClaimPortal: Integrated Monitoring, Searching, Checking, and Analytics of Factual Claims on Twitter

<https://idir.uta.edu/claimportal/>

Home

Analytics

How it works?

Watch later

Search keywords

Industries/hashtags

Claim type

Filter based accounts

Monitoring these accounts

Date from: From: 2019-Apr-11 To: 2019-May-10

Date until

Sort by: Contributor score (highest first)

Search

0.0 - 0.1

0.1 - 0.2

0.2 - 0.3

0.3 - 0.4

0.4 - 0.5

0.5 - 0.6

0.6 - 0.7

0.7 - 0.8

0.8 - 0.9

0.9 - 1.0

Kaileen Collins
@skallanecore

President Trump's reelection campaign raised more than \$30 million in the first fundraising quarter of 2019, per the campaign. Almost 99 percent of those donations were \$200 or less, and they now have \$40.8 million on hand.
8:53 PM - Apr 14, 2019

836 people are talking about this

Kenneth P. Vogel
@kenvogel

NEW: The TRUMP campaign says in Q1, 98.79% of its donations* were from \$200 or less, with \$34 avg donation.

*this is % of donations of \$200 or less, not % of \$ from such donations or even % of small donors.

Bill Trump is an undeniable small \$ force.
<https://times.com/2019/04/14/bill-trump/>
7:19 PM - Apr 14, 2019

21 people are talking about this

Senator Mike Crapo
@MikeCrapo

According to [fiscalscout](https://www.fiscalscout.com), data through the end of March showed a 25 percent decrease in individual tax liability. That's great news for the American taxpayer and our economy! The [FTC](https://www.fiscalscout.com) has allowed more Americans to see larger electronics throughout the year!
<https://www.fiscalscout.com>

Press release content.

The AP news staff was not involved in its creation.

James Hohmann
@jameshohmann

Replying to @jameshohmann
Kamela Harris released 15 years of tax returns on Sunday, showing that she and her husband earned \$1.8 million last year and gave \$27,000 to charity — or 1.4%. Harris reported no charitable giving at all during her first 3 years as California's attorney general. Not one donor.

67 people are talking about this

Amy Klobuchar
@AmyKlobuchar

Amy Klobuchar and her husband donated \$6,600 of their \$308,500 income to charity last year, under 2%. That's a similar percentage to Kristin Gilliland. She and her husband gave \$3,750 to charity last year.
9:20 AM - Apr 15, 2019

67 people are talking about this

Shane Goldmacher
@ShaneGoldmacher

NEW: Pete Buttigieg spent less than \$700,000 in Q1 and has \$6.4 million in the bank, per new FEC filing.

His "burn rate." Less than 10%.
<https://www.fec.gov/disclosure/>
8:06 AM - Apr 15, 2019

188 people are talking about this

Urban Institute
@UrbanInstitute

In 1972, the average American union carpenter earned the current equivalent of \$33.55/hour—about \$70,000 a year. Today, a carpenter earns an average of \$20.23/hour—or about \$42,000 annually, reports [UrbanInstitute.org](https://www.urbaninstitute.org).
8:10 AM - Apr 11, 2019

See Urban Institute's other Tweets

The Center for Public Integrity
@PublicIntegrity

Middle-wage jobs largely no longer pay middle-class salaries
A primary complaint about the current U.S. economy has been the loss...
<https://www.cpi-center.org>

See Urban Institute's other Tweets

Steven Greenhouse
@greenhousest

Elizabeth Warren's new tax plan would impose a 7% tax on corporate profits above \$100 million with no "loopholes or exemptions." Under her plan, Amazon would pay \$698 million in corporate taxes, instead of just, on its \$10 billion in profits.
<https://www.nytimes.com/2019/04/12/us/politics/elizabeth-warren-tax-plan.html>
10:10 8:26 AM - Apr 12, 2019

58 people are talking about this

Rep. Donald Payne Jr.
@RepDonaldPayne

FEMA announced \$36.3 million in homeland security grants for New Jersey. Good.

FEMA also announced a \$2.7 million to law enforcement terrorism prevention grants in the Newark/Jersey City area. Bad.

IS continue pushing FEMA for funding [payne.house.gov/news](https://www.house.gov/payne)
7:26 PM - Apr 12, 2019

See Rep. Donald Payne Jr's other Tweets

Bernie Sanders
@BernieSanders

Amazon made \$10,835,000,000 last year. Its effective federal tax rate was -1%.

Delta made \$5,073,000,000. Its effective tax rate was -4%.

Our rigged tax code has essentially legalized tax dodging for large corporations.
2:04K 3:14 PM - Apr 12, 2019

8,092 people are talking about this

GOP
@GOP

Bernie's \$32 trillion plan for the complete elimination of private health insurance would cost 50-year-olds
-Eradicate over half a million good-paying jobs
-More than double taxes
-Kick over 177 million Americans off their health insurance plans
Destroy choices for families across America.
3:12M 6:15 PM - Apr 15, 2019

2,468 people are talking about this

Jim Banks
@RepJimBanks

Under [GOP](https://www.gop.com) leadership:
- 3.2 million new jobs created
- Unemployment near 50-year low
- Jobless claims lowest since 1969
- Manufacturing job creation highest in 20 years
- Longest streak of consecutive job growth

Great piece in [USAJournal](https://www.usajournal.com) today. <https://www.usajournal.com>
8:57 8:57 AM - Apr 15, 2019

See Jim Banks's other Tweets

IC
@IC

GOP brings boom times 1 Home 1 Journal Gazette
This Tax Day, we celebrate higher wages, record economic optimism, record low unemployment and



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STORE

Lab-invented bio-terrorism: researchers discover unique, manmade viral manipulations of the COVID-19 strain

7,480 Views

(Natural News) The Wuhan Institute of Virology in China is under worldwide scrutiny after a highly infectious strain of coronavirus began rapidly infecting Wuhan citizens late in 2019, before rapidly infecting people throughout the world.

Now a new Australian study finds that the precise RNA sequence of the SARS-CoV-2 virus contains man-made manipulations that could have only been created in a laboratory. The Wuhan Institute of Virology is home to questionable virus experiments that push the boundaries of scientific ethics. For years, Chinese researchers have been conducting gain-of-function research on bat coronaviruses to manipulate the properties of viruses and to enhance their virulence and infectivity.



COKN Health Info Check

Displays related health misinformation debunks from the Google Fact Check Explorer.

coronavirus began rapidly infecting Wuhan citizens late in 2019, before rapidly infecting people throughout the world.

Claim 4 SARS-CoV-2 contains man-made manipulations to enhance its virulence in human cells

Related Claim: A Facebook post claims the SARS-CoV-2 coronavirus shares a spike glycoprotein with HIV, and that the glycoprotein is patented by US health official Dr Anthony Fauci.

Australian Associated Press False - The primary claims of the content are factually inaccurate.

Claim 5 Five Australian scientists concur that the SARS-CoV-2 virus behind the COVID-19 pandemic contains unique, lab-invented

**Deliverable:
Browser plugin to flag
health misinformation**

