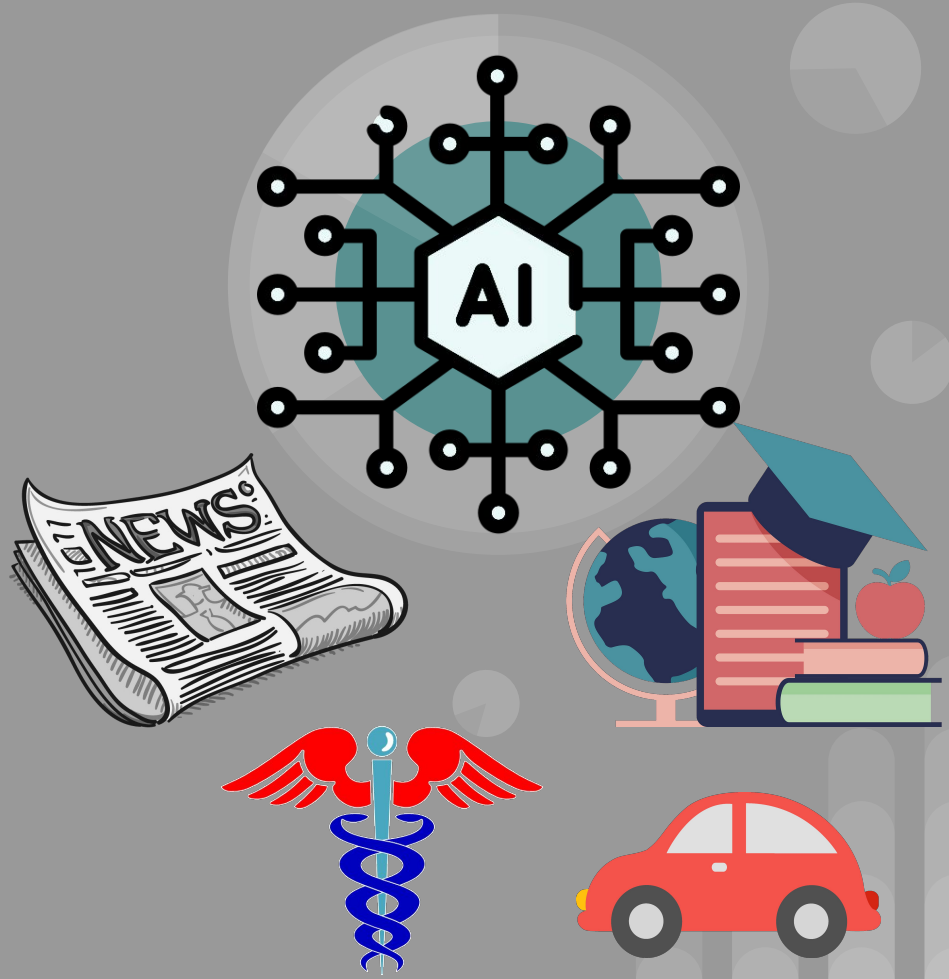
Media and News Portrayal of AI in the US and UK

By Noah Rizika, Jed Hodulik and Ivo Verzone



"It is difficult to think of a major industry that AI will not transform. This includes healthcare, education, transportation, retail, communications, and agriculture. There are surprisingly clear paths for AI to make a big difference in all of these industries."

Andrew Ng, Computer Scientist and Global Leader in AI

AI Capabilities and Threats are Uncertain

Experts from different fields weigh in on the gravity of the new invention

"Success in creating AI would be the biggest event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks." -***Stephen Hawking, Theoretical Physicist***

"I imagine a world in which AI is going to make us work more productively, live longer, and have cleaner energy." -***Fei-Fei Li, Professor of Computer Science at Stanford University***

"What all of us have to do is to make sure we are using AI in a way that is for the benefit of humanity, not to the detriment of humanity." -***Tim Cook, CEO of Apple***

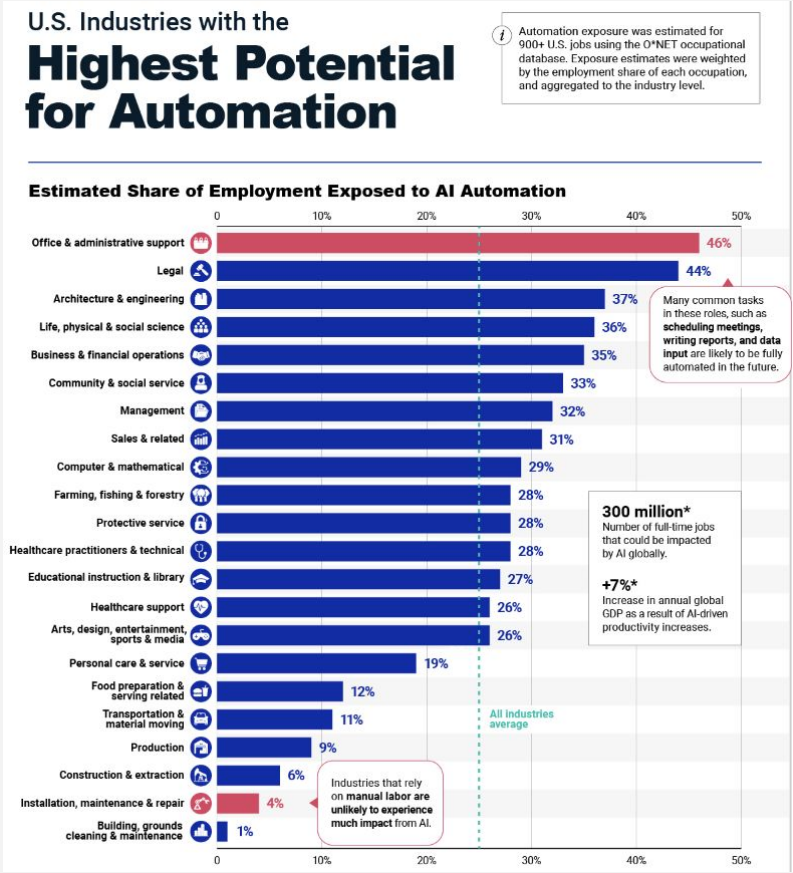
"AI will probably most likely lead to the end of the world, but in the meantime, there'll be great companies." -***Sam Altman, Chairman of OpenAI***

The meteoric rise of AI has governments scrambling to create regulations via legislation.

Why You Should Care

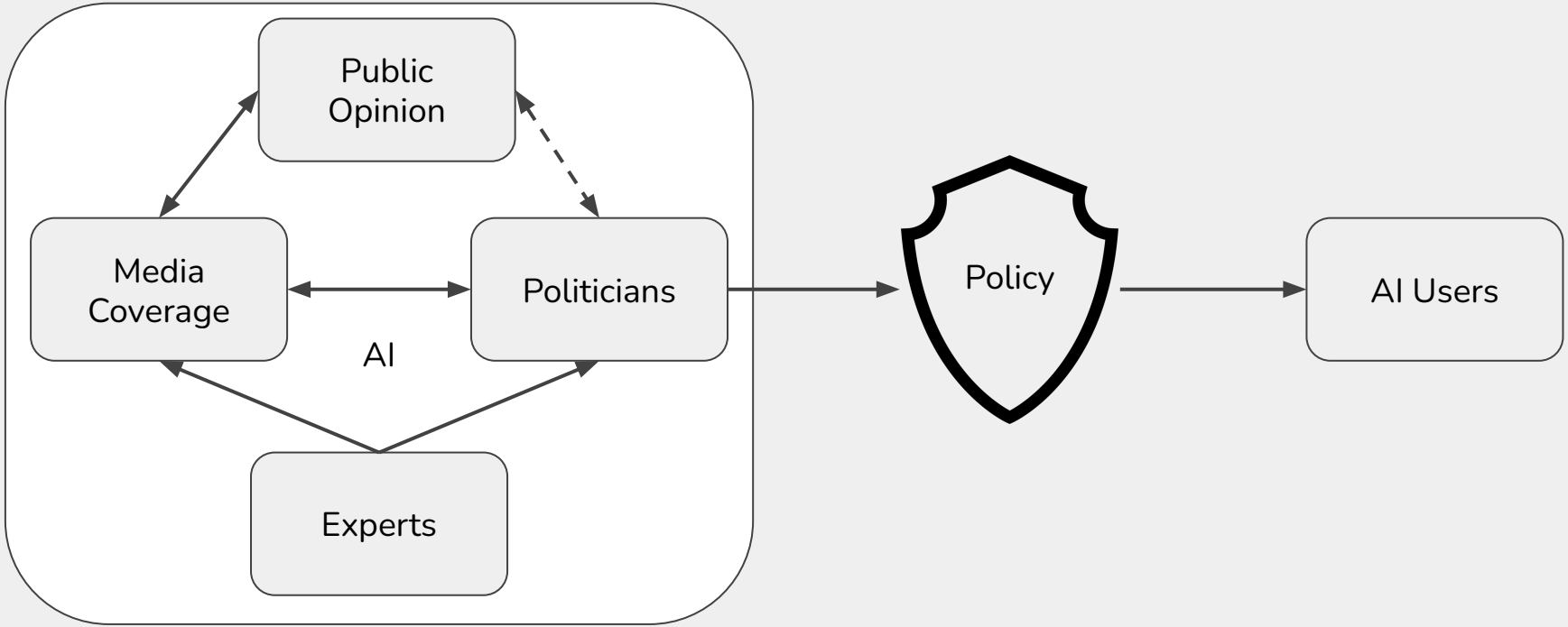
About the Portrayal of AI in News and Media

- AI will impact all aspects of life in unknown ways
  - Social
  - Political
  - Economic
  - Cultural
  - Industrial
  - Etc...
- Need for educated citizens and protective legislation



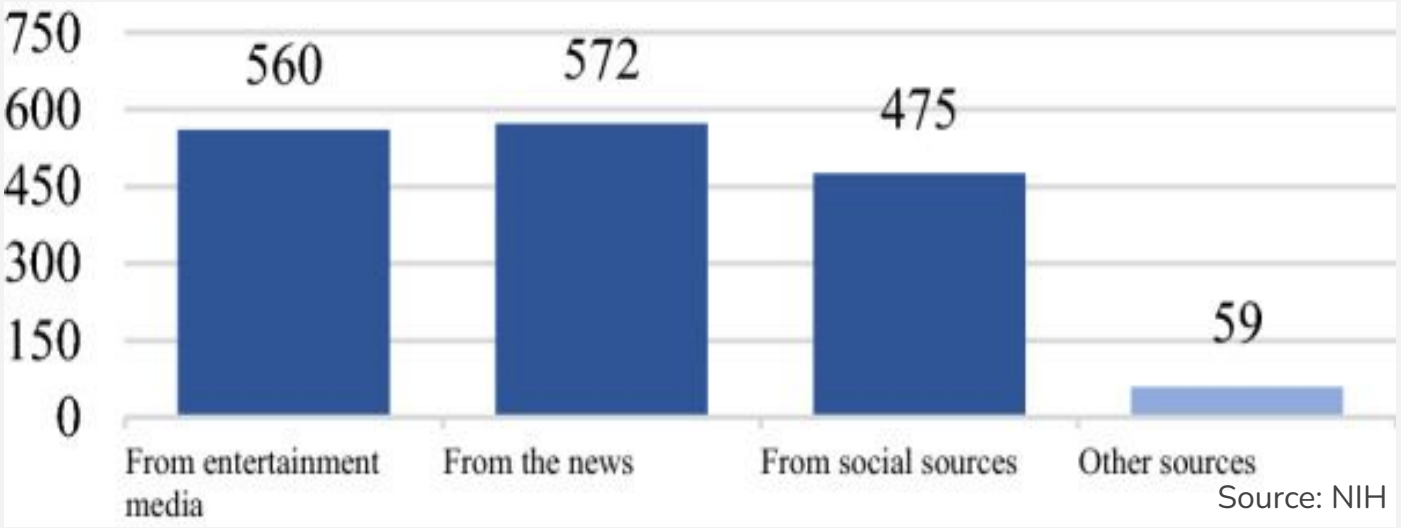
Why Analyze Sentiment Surrounding AI?

Policies are formed through politicians who are influenced through public opinion and media



Why is the News Important in the Public Opinion of AI

Most people learn about AI through the News



Source: NIH

Sources from which people get AI information
The news plays a big role in influencing public opinion of AI

Discoveries

Thesis: AI is becoming politicized in the US and UK.

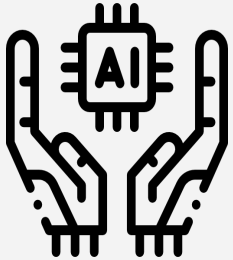
I. The US and UK newspapers are expressing increasingly negative sentiment towards AI.
II. Left leaning media outlets report on AI more negatively than right leaning ones.
III. In articles about industry, the economy is discussed more often than ethics, particularly by left-leaning newspapers and in the US.
IV. Right and left leaning newspapers cover ethics disproportionately relative to the country of origin.

Methods and Data

Our Approach

We analyzed AI news articles from the US and UK and across political leanings

AI Portrayal in News/Media over Time



AI Portrayal in the US

AI Portrayal in the UK

Left-Leaning Papers

Right-Leaning Papers

Left-Leaning Papers

Right-Leaning Papers

Methods and Data

Papers:	US: New York Times, Washington Post, Wall Street Journal, USA Today UK: The Guardian, The Observer, The Daily Telegraph, The Sunday Telegraph
Number of Articles	29,129
Time Period	01/01/2000 to 06/30/2023
Search Terms	“AI” “A.I.” “Artificial Intelligence”
Tools Used	Topic Modeling, Feature Generation, Sentiment Analysis, Pandas Analysis
Strengths	Custom Functions - Diverse, Large, and Current Data Source

Limitations:

Prevalence of AI in news is relatively recent

Inability to analyze sources in entertainment media like documentaries, shows, or books

Inability to analyze social media sources

Custom Functions

Crosstab1by1

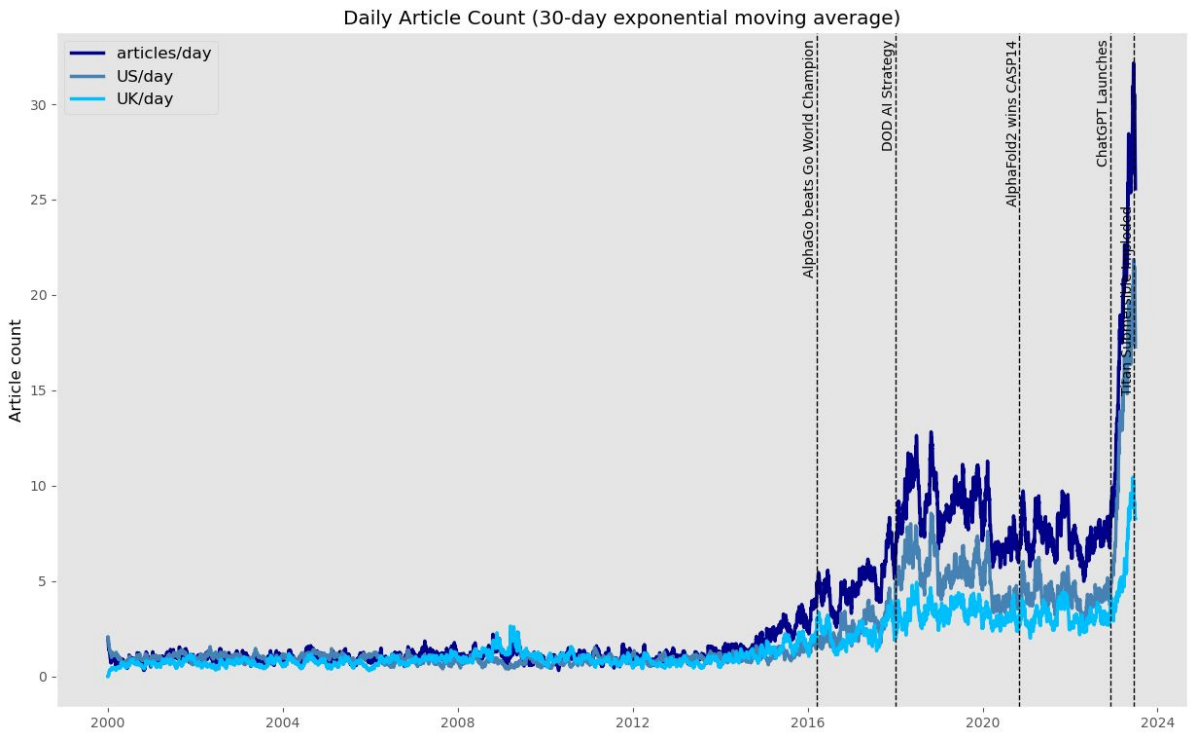
```
# Gives following output:
# Of N total articles mentioning fA, M mention fB: x%
# Of N total articles that do not mention fA, M mention fB: x%
def crosstab1by1(fA, fB):

    # Create data frames to extract total counts for each variable
    fA_counts = df[fA].value_counts()
    fB_counts = df[fB].value_counts()

    # Extract total counts
    fA_0 = fA_counts[0]
    fA_1 = fA_counts[1]

    # Create crosstab of all results (4x4 table)
    crosstab_result = pd.crosstab(df[fA], df[fB])

    # Extract relevant frequencies
    fA0_fB0 = crosstab_result.loc[0, 0]
    fA0_fB1 = crosstab_result.loc[0, 1]
    fA1_fB0 = crosstab_result.loc[1, 0]
    fA1_fB1 = crosstab_result.loc[1, 1]

    # Calculate the frequency of the counts for fB proportionately to the articles in fA
    prop1 = fA1_fB1 / fA_1
    prop2 = fA0_fB1 / fA_0

    print('Of {} total articles mentioning {}, {} mentioned {}: {:.2%}'.format(fA_1, fA, fA1_fB1, fB, prop1))
    print('Of {} total articles that do not mention {}, {} mentioned {}: {:.2%}'.format(fA_0, fA, fA0_fB1, fB, prop2))
    print('Difference: {:.3}%'.format((prop1 - prop2)*100))
```

```python
def crosstab2by1(fA, fB, fC):
    # example:
    # fA = 'allindustries'
    # fB = 'left-lean-us'
    # fC = 'not-left-lean-us'

    # number of all industry articles
    fA_counts = df[fA].value_counts()
    fB_counts = df[fB].value_counts()
    fC_counts = df[fC].value_counts()

    # number of left-lean-us articles
    fB_1 = fB_counts.loc[1]

    # number of not-left-lean-us articles
    fC_1 = fC_counts.loc[1]

    cross_tab = pd.crosstab(index=[df[fA]], columns=[df[fB], df[fC]])

    # Access counts for a category (political leaning or country) in fA
    counts_in_fA = cross_tab.loc[1]

    # left lean us, all industries
    fA1_fB1_fC0 = counts_in_fA[1][0]

    # not left lean us, all industries
    fA1_fB0_fC1 = counts_in_fA[0][1]

    # industry:total for left
    prop1 = fA1_fB1_fC0/fB_1

    # industry:total for right
    prop2 = fA1_fB0_fC1/fC_1

    # proportional comparison between percentages of category mentions from both features
    prop3 = prop1/prop2

    # we want the proportion of industry publishings from the left : from the right
    # AND from the left : total number of left publishings, and same for not left

    print('Of {} total articles that are {}, {} mentioned {}: {:.2%}'.format(fB_1, fB, fA1_fB1_fC0, fA, prop1))
    print('Of {} total articles that are {}, {} mentioned {}: {:.2%}'.format(fC_1, fC, fA1_fB0_fC1, fA, prop2))
    print('Percentage Difference: {:.2%}'.format(prop1 - prop2))
    print('Proportion of the percentages (prop1 / prop2): {:.3}'.format(prop3))
```

Custom Functions

Crosstab2by1

First Impressions of Our Data



Hypothesis 1

Sentiment towards AI: US and UK

Hypothesis 1:

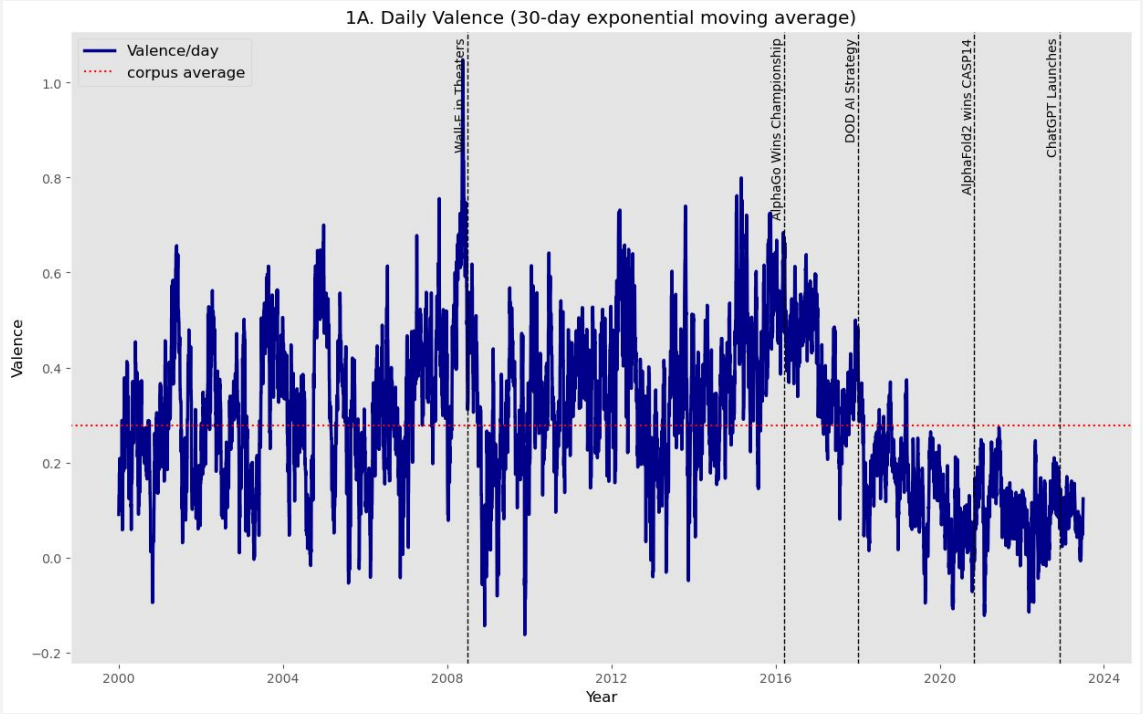
H1A : Positive sentiment regarding AI has decreased in the US and UK
H1B : Positive sentiment towards AI is stronger in the US than in the UK

- The UK is heavily influenced by the EU and tends to be relatively strict when it comes to new technologies such as AI
    - The UK will have a less positive sentiment towards AI because of its proactive regulatory approach like the EU
- The US generally leaves regulation up to private tech companies
    - The US's historical lack of government involvement concerning AI suggests that there is more positive press about AI
- The recent increase in governmental monitoring of AI is likely a result of news and media coverage of AI becoming both more widespread and less positive

*Based off the assumption that democratic governments make laws that reflect public sentiment and values

Hypothesis 1 Results:

Sentiment has become less positive in articles mentioning AI, most notably starting in 2016



H1B. Valence by Country

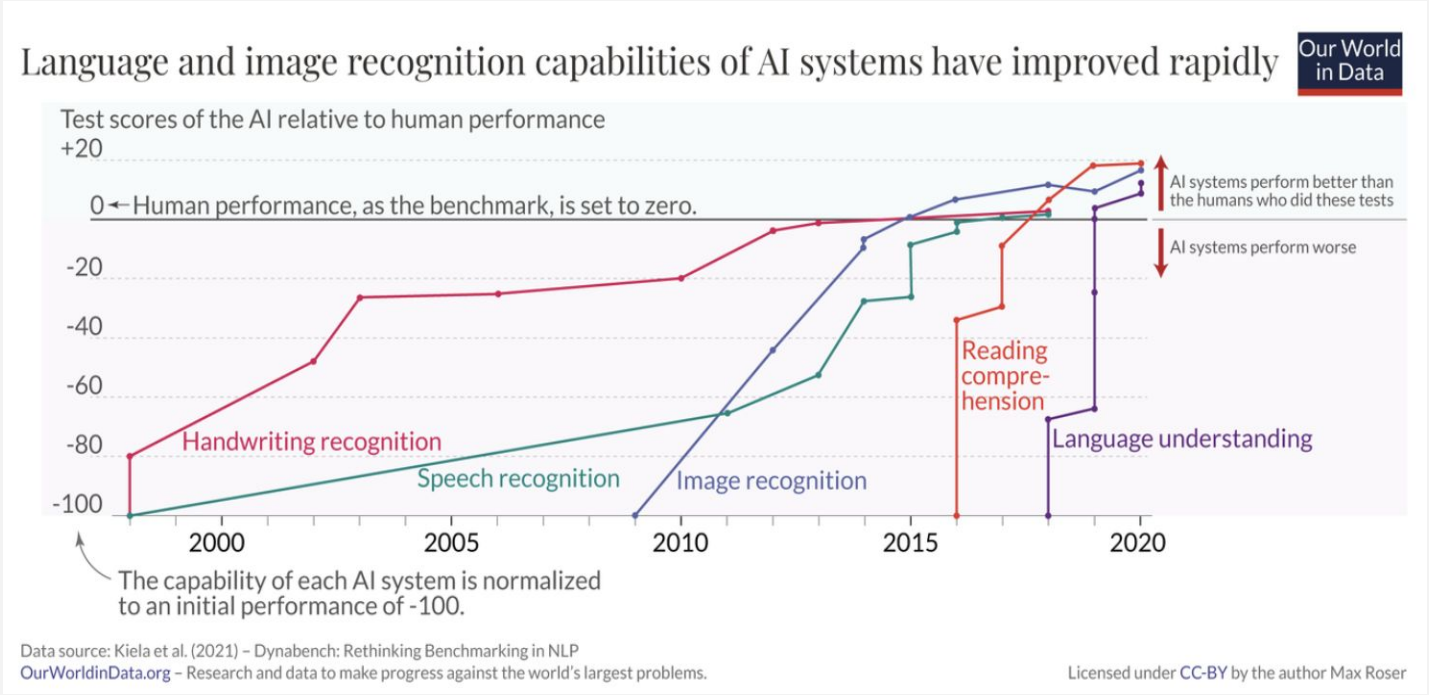
US	0.218
UK	0.235

The US has less positive AI sentiment than the UK

0.225 avg valence
0.185 avg valence post 2016
0.040 valence change

Hypothesis 1 Results:

Sentiment has become less positive in articles mentioning AI, most notably starting in 2016



Hypothesis 2

Politicization of AI

Hypotheses 2:

H2A: Left-leaning papers will mention AI less positively than right-leaning papers
H2B: The partisan gap widens when focusing on polarizing subtopics

- News has been highly politicized across a number of topics
- Conservative minded people are more likely to resist the potential results or consequences of AI
    - Conservatives in general are less willing to adjust to change
- New technologies are politicized since they can be used to gain power and influence
    - Guns, climate change technology, vaccination technology, social media, etc.
- Generative AI can produce output with political leanings which could make it more attractive to certain parties
    - ChatGPT has recently been recognized as “left leaning”

Hypothesis 2A:

Left-leaning news articles are less positive when talking about AI than non-left leaning papers.

The gap between the left and right valences is larger in the US than the UK.

Overall, the news tends to talk about AI in a fairly positive light.

Country	Political leaning	Valence	Difference (Right - Left)	Overall Difference (Right - Left)
US	Left	0.184	0.136	0.103
US	Right	0.320		
UK	Left	0.211	0.065	
UK	Right	0.276		

Hypothesis 2B:

When focusing on subtopics we assumed to be polarizing (**security** and **jobs**), the partisan gap on sentiment widens.

Overall Difference
0.103

Newspaper leaning	**"Jobs"** feature valence	Difference (Right - Left)
Left	0.220	0.159
Right	0.379	

Newspaper leaning	**"Security"** feature valence	Difference (Right - Left)
Left	0.085	0.163
Right	0.248	

Hypothesis 3

Ethics and Economy

Hypothesis 3:

H3A. News articles in the US and UK will discuss economics more often than ethics across education, transportation, and healthcare industries

H3B. Left-leaning outlets will mention ethics more often than economics in reporting on the aforementioned industries, whereas right-leaning outlets will mention economics more often than ethics.

- The US is a global leader in AI development
  - Ex: OpenAI, Microsoft, Google, Meta, Apple, NVIDIA, Tesla
  - $249 billion of private investment has gone to AI development
- US has a “free market” policy for technology
- The UK has recently adopted a “world-leading approach” to improve the ethical adoption of AI in healthcare
- Past study on UK left and right media coverage
  - Different industry coverage
  - Ethics vs Security

Hypothesis 3:

H3A. News articles in the US and UK will discuss economics more often than ethics across education, transportation, and healthcare industries

H3B. Left-leaning outlets will mention ethics more often than economics in reporting on the aforementioned industries, whereas right-leaning outlets will mention economics more often than ethics.

Comparing Mentions of Economy vs. Ethics

Percent to which economic articles are published more often than ethics articles by country and political leaning

	% Economy articles - % Ethics articles	
H3A	**US**	**UK**
All Industries	17.18%	8.77%
Education	10.66%	4.96%
Healthcare	9.57%	4.79%
Transportation	8.73%	4.07%

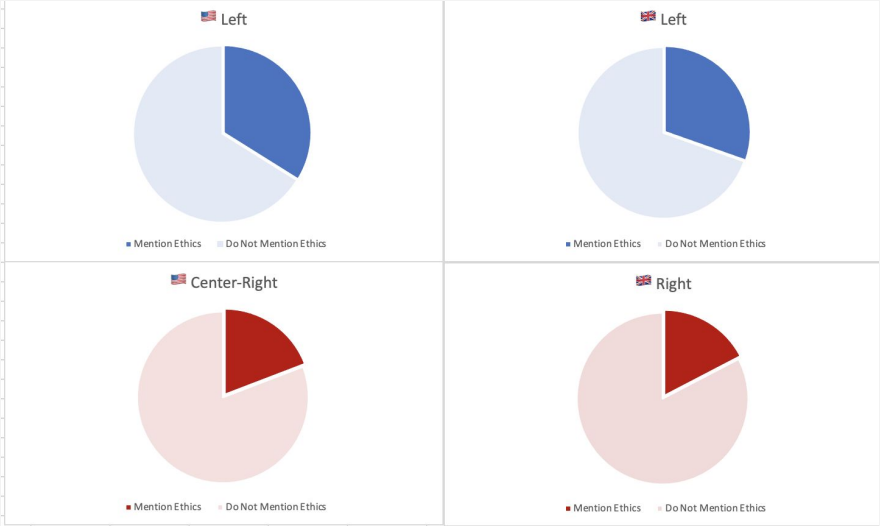
H3A. Percentage of economics to ethics articles published in the US and UK

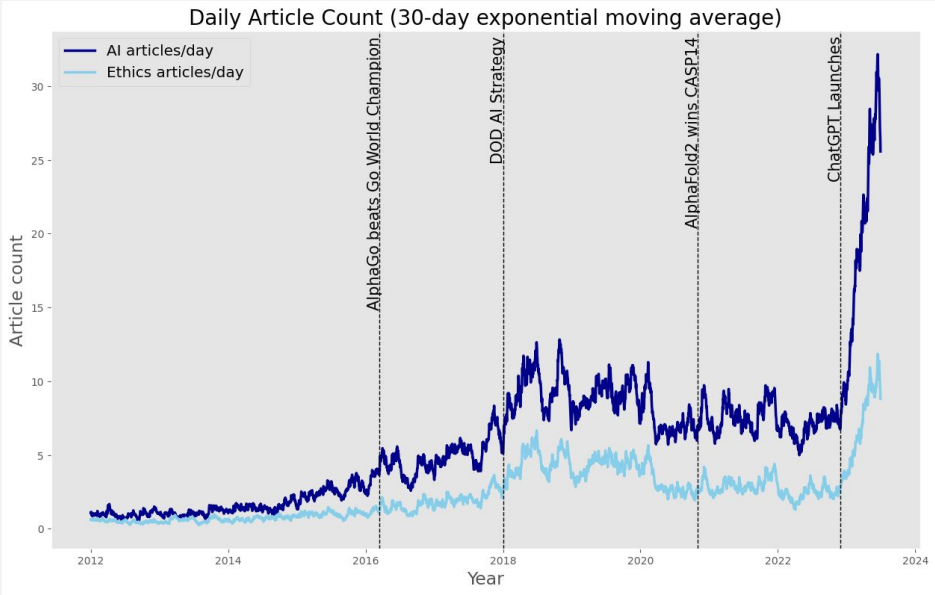
	% Economy articles - % Ethics articles	
H3B	**Left**	**Right**
All Industries	14.07%	11.89%
Education	8.14%	6.23%
Healthcare	7.23%	5.57%
Transportation	9.24%	6.37%

H3B. Percentage of economics to ethics articles published in left and right media outlets. Media outlets are from the US and UK.

Expansion: AI and Ethics in US and UK Media

Percentage of Ethics-Related AI Articles Published by Media Outlets from Each Countries' Political Leaning





Conclusion

Takeaways

1. Negative sentiment in AI articles has increased over time as AI becomes more popular
2. Left-leaning news portrays AI more negatively than the non-left
3. Discussion on AI is centered around the economy more than ethics
4. AI content and sentiment is different depending on location and political affiliation

Looking Ahead

Implications

Awareness about the politicization of historically non-partisan issues

Importance of distinguishing different media portrayals of new technologies

Further Research

Include most recent articles in the analysis

Look at social media or TV for AI representations

How will the politicization of AI impact tech governance?

Thank you.
Any Questions?

Discussion Questions

- Do you think AI will contribute more positively or negatively to society? Why?
- Do you think AI will become politicized? Should we be worried?
- Should the government be trusted to regulate AI? If not, who should be?
- In what ways can regulators balance innovation with ethical considerations in AI development?
- Do you think there will be challenges implementing consistent AI regulation across cities, states, and countries?

Bibliography

Andreessen, M. (2023, June 6). *Why AI Will Save the World*. Andreessen Horowitz. https://a16z.com/ai-will-save-the-world/

Bove, T. (2023, May 30). *AI poses a "risk of extinction" to humanity, Sam Altman warns*. Fortune.\https://fortune.com/2023/05/30/sam-altman-ai-risk-of-extinction-pandemics-nuclear-warfare/

Bhuiyan, J., & Robins-Early, N. (2023). *The EU is leading the way on AI laws. The US is still playing catch-up | Artificial intelligence (AI) | The Guardian*. https://www.theguardian.com/technology/2023/jun/13/artificial-intelligence-us-regulation

Brause, S. R., Zeng, J., Schäfer, M., & Katzenbach, C. (2023). *Media Representations of Artificial Intelligence. Surveying the Field* (S. Lindgren, Ed.; p. Epub ahead of print). Edward Elgar Publishing Ltd. https://doi.org/10.5167/uzh-233071

Brennen, J. S., Howard, P., & Nielsen, R. K. (2018). An industry-led debate: How UK media cover artificial intelligence. *Reuters Institute for the Study of Journalism*. https://ora.ox.ac.uk/objects/uuid:02126b4c-f4f9-4582-83a0-f8a9d9a65079

Blackburn, R. A. (2018). Summary of the 2018 Department of Defense Artificial Intelligence Strategy.

Castelo, N., & Ward, A. F. (2021). Conservatism predicts aversion to consequential Artificial Intelligence. *PLOS ONE*, *16*(12), e0261467. https://doi.org/10.1371/journal.pone.0261467

Chuan, C.-H., Tsai, W.-H. S., & Cho, S. Y. (2019). Framing Artificial Intelligence in American Newspapers. *Proceedings of the 2019 AAAI/ACM Conference on AI, Ethics, and Society*, 339–344. https://doi.org/10.1145/3306618.3314285

European Parliament. (2023, August 6). *EU AI Act: First Regulation on Artificial Intelligence | News | European Parliament*. Www.europarl.europa.eu. https://www.europarl.europa.eu/news/en/headlines/society/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence

Feiner, H. F. (2023, October 30). *Biden unveils U.S. government's first-ever AI executive order*. CNBC. https://www.cnbc.com/2023/10/30/biden-unveils-us-governments-first-ever-ai-executive-order.html

Keary, T. (2023, November 16). *Top 10 Countries Leading in AI Research & Technology in 2023* . Techopedia. https://www.techopedia.com/top-10-countries-leading-in-ai-research-technology

Lu, M. (2023, June 27). *Ranking Industries by Their Potential for AI Automation*. Visual Capitalist. https://www.visualcapitalist.com/sp/ranking-industries-by-their-potential-for-ai-automation/

Bibliography

Martin, N. (2019, June 27). *13 Best Quotes About The Future Of Artificial Intelligence*. Forbes. https://www.forbes.com/sites/nicolemartin1/2019/06/27/13-greatest-quotes-about-the-future-of-artificial-intelligence/?sh=d8e7b7f3bdfa

Nader, K., Toprac, P., Scott, S., & Baker, S. (2022). Public understanding of artificial intelligence through entertainment media. *AI & SOCIETY*. https://doi.org/10.1007/s00146-022-01427-w

Nguyen, D., & Hekman, E. (2022). The news framing of artificial intelligence: A critical exploration of how media discourses make sense of automation. *AI & SOCIETY*. https://doi.org/10.1007/s00146-022-01511-1

Ponciano, J. (2023, June 8). *The World's Largest Technology Companies In 2023: A New Leader Emerges*. Forbes. https://www.forbes.com/sites/jonathanponciano/2023/06/08/the-worlds-largest-technology-companies-in-2023-a-new-leader-emerges/

Prinsley, M., Yaros, O., Reece, R., Ondrej Hajda, & Ellen Hepworth. (2023, July). *UK's Approach to Regulating the Use of Artificial Intelligence | Perspectives & Events | Mayer Brown*. https://www.mayerbrown.com/en/perspectives-events/publications/2023/07/uks-approach-to-regulating-the-use-of-artificial-intelligence

Seale, C. (2002). Cancer Heroics: A Study of News Reports with Particular Reference to Gender. *Sociology*, *36*(1), 107–126. https://doi.org/10.1177/0038038502036001006

Shaikh, S. J., & Moran, R. E. (2022). Recognize the bias? News media partisanship shapes the coverage of facial recognition technology in the United States. *New Media & Society*, 14614448221090916. https://doi.org/10.1177/14614448221090916

Shepherd, E., & Seale, C. (2010). Eating disorders in the media: The changing nature of UK newspaper reports. *European Eating Disorders Review*, *18*(6), 486–495. https://doi.org/10.1002/erv.1006

UK to pilot world-leading approach to improve ethical adoption of AI in healthcare. (2022, February 8). GOV.UK. https://www.gov.uk/government/news/uk-to-pilot-world-leading-approach-to-improve-ethical-adoption-of-ai-in-healthcare

Appendix - Search Specs

Threat: threat*, danger*, risk*, bias*, endanger*, harm, unfair*, prejudice*
Solutions: solut*, answer*, resolv*, solv*, safeguard*, help*
Ethics: moral*, ethic*, equalit*, fairness, justice, rights, accountability, integrity, transparen*
Security: secur*, priva*, safe*, ID, protect*, safeguard*
Education: education, school*, universit*, student*, college*
Healthcare: medic*, drug*, doctor*, dr, nurse*, patient*, clinical, disease*, hospital*, diagnos*, treatment*, x-ray*, screening*, health*
Videogames: xbox, playstation, game*, gaming, multiplayer, gameplay, ea, ps3, chess, cheat*, player*, tournament*, win*
Politics: politic*, minister, president, elect*, democrat*, republican*
Economy: econom*, GDP, employ*, productiv*, wage*, job*, growth
Market: market*, stock*, commodit*, hedge fund, index fund, investor*, dollar*, shares, stock*, quarter*
Tech Company: twitter, apple, google, amazon, iphone, phone, device*
Transportation: self-driving, car, automat*
Entertainment: tv, movie*, hollywood, Disney, series, film*
Contaminates: weiwei, miyazato, sugiyama, spielberg, osment, aldiss, kubrick
Governance: policy, polici*, govern*, law*, regulat*