The Framing of Artificial Intelligence in the News

By Berber, Celesta, Debarupa, Meagan, and Nina

JOE LONSDALE   BUSINESS

AI and robots will take our jobs – but better ones will emerge for us

The fear that robots will soon take your jobs has a grain of truth to it – however, the future paves the way for more jobs for humans, based in technological innovation

Technology

Robots will destroy our jobs – and we're not ready for it

Research gap

- Different news outlets **frame** the subject of A.I. differently

- Danger of echo chambers / filter bubbles

- Create your own **balanced news diet**

- New, rapidly advancing technology $\rightarrow$ research needs to be up-to-date

Research question

"How do different **news outlets** frame the subject of **artificial intelligence** in online articles with respect to the **topics** and **sentiment**?"
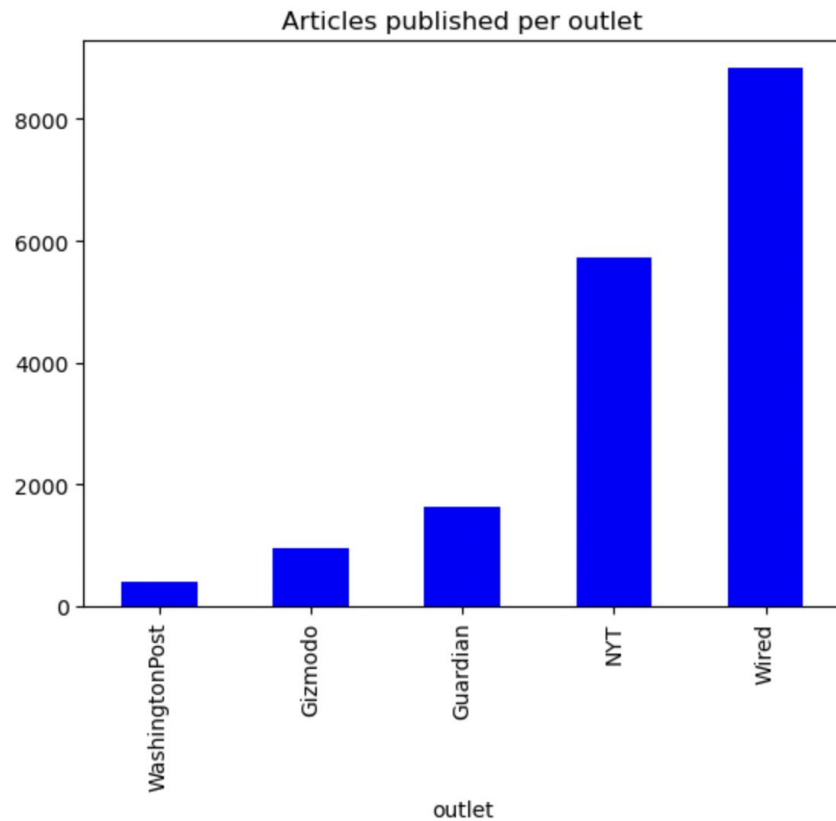
The data

- 5 news outlets (Gizmodo, Guardian, NYT, Washington Post, Wired)

- Article sections: Body vs Description

- 17,545 articles

	filename	outlet	title	description	datetime	body	category
0	2010-06-gears-of-war-3-beast.html	Wired	Gears of War 3 Co-op Makes Beasts of Gamers	LOS ANGELES — Back in 2008, Gears of War 2 int...	2010-06-17 16:22:00.000	LOS ANGELES – Back in 2008, Gears of War 2 in...	NaN
1	sponsored-story-innovating-for-the-individual....	Wired	WIRED Brand Lab | Innovating for the Individual	What every leader can learn from the technolog...	2021-08-27 12:14:31.296	Innovative technology is making healthcare mor...	NaN
2	ttps:--www.wired.com-story-for-all-mankind-bes...	Wired	'For All Mankind' Is the Best Sci-Fi of Its Era	The Apple TV+ alternate history series is simp...	2022-06-09 07:00:00.000	New Star Wars, new Star Trek, Russian Doll, Se...	NaN
3	story-ghostery-open-source-new-business-model....	Wired	Ad-Blocker Ghostery Just Went Open Source—And ...	Ghostery, Edward Snowden's preferred ad-blocke...	2018-03-08 09:45:00.000	In privacy-focused, anti-establishment corners...	NaN
4	story-best-game-subscriptions.html	Wired	Too Many Game Subscription Services? Here's Ho...	PlayStation Plus Extra or Plus Premium? Xbox L...	2022-04-11 10:00:00.000	Gaming is starting to look more and more like...	NaN

The data

Articles published per outlet

The news outlets: Expected perspectives

- **Gizmodo** Tech blog, entertaining, consumer-focused
  Highlight **interesting or amusing uses** of the technology

- **Guardian** Progressive, investigative, social and political issues
  Focus on **social and ethical implications**

- **New York Times** Informative, in-depth, balanced
  Provide both **benefits and drawbacks**

- **Washington Post** Politics, policy, and social issues
  Focus on **political and policy implications**

- **Wired** Tech blog, forward-thinking, in-depth
  Focus on the **latest developments** in the field and **potential future implications**

Methods

- Topic Modeling

- Sentiment Analysis

Methods: Topic modeling

- Two different approaches: **K-means vs LDA**

- Article sections: body vs description

- **LDA on article bodies**

- Most coherent topics

- Per outlet: preprocessing → comparing coherence scores → topics

Preliminary results: Topic modeling

- ## Results per outlet

  Disclaimer: we're still working on this

- ## The Guardian

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THE TOP 10 WORDS FOR TOPIC #0
['alphago', 'program', 'said', 'machine', 'computer', 'human', 'learning', 'deepmind', 'player', 'game']

THE TOP 10 WORDS FOR TOPIC #1
['time', 'technology', 'new', 'business', 'use', 'people', 'company', 'information', 'big', 'data']

THE TOP 10 WORDS FOR TOPIC #2
['world', 'test', 'judge', 'professor', 'say', 'science', 'computer', 'turing', 'year', 'university']

THE TOP 10 WORDS FOR TOPIC #3
['think', 'way', 'intelligence', 'world', 'thing', 'robot', 'computer', 'people', 'machine', 'human']

THE TOP 10 WORDS FOR TOPIC #4
['company', 'campaign', 'analytica', 'cambridge', 'facebook', 'character', 'people', 'data', 'say', 'game']

THE TOP 10 WORDS FOR TOPIC #5
['car', 'worker', 'say', 'people', 'new', 'year', 'work', 'technology', 'said', 'job']

THE TOP 10 WORDS FOR TOPIC #6
['learning', 'use', 'machine', 'say', 'algorithm', 'google', 'said', 'company', 'technology', 'people']

THE TOP 10 WORDS FOR TOPIC #7
['said', 'drone', 'video', 'military', 'robotics', 'technology', 'autonomous', 'human', 'weapon', 'robot']
```

Preliminary results: Topic analysis

- The Washington Post

- Manually labeling the topics

	Group Member #1	Group Member #2	Group Member #3	Group Member #4	Group Member #5
Topic 0	China	China	China	China	China
Topic 1	Games	Computer Games	Games	Games	Games
Topic 2	Apple / Musk	Computer	AI	Musk	Big tech companies
Topic 3	Education	Education	Education	USA	Education

```
THE TOP 10 WORDS FOR TOPIC #0
['camera', 'google', 'sentence', 'human', 'chinese', 'home', 'make', 'people', 'said', 'china']

THE TOP 10 WORDS FOR TOPIC #1
['time', 'said', 'intelligence', 'poker', 'child', 'machine', 'nan', 'human', 'player', 'game']

THE TOP 10 WORDS FOR TOPIC #2
['year', 'technology', 'machine', 'said', 'computer', 'apple', 'musk', 'artificial', 'human', 'intelligence']

THE TOP 10 WORDS FOR TOPIC #3
['google', 'washington', 'school', 'post', 'year', 'student', 'university', 'technology', 'company', 'said']
```
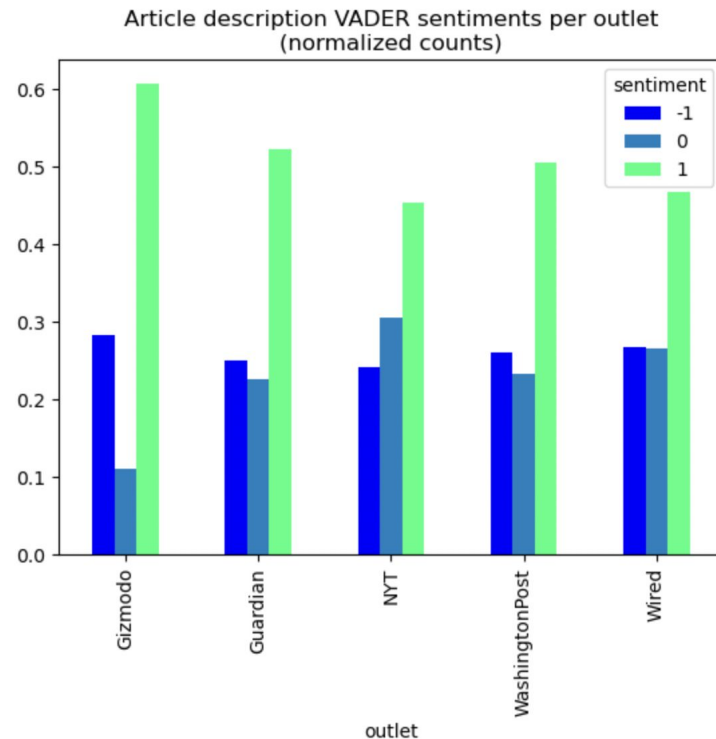
Methods: Sentiment analysis

- Pre-trained sentiment classifiers: **VADER vs TextBlob**

- Article sections: Body vs Description

- **VADER on descriptions**

- Sentiment assignment seemed most accurate

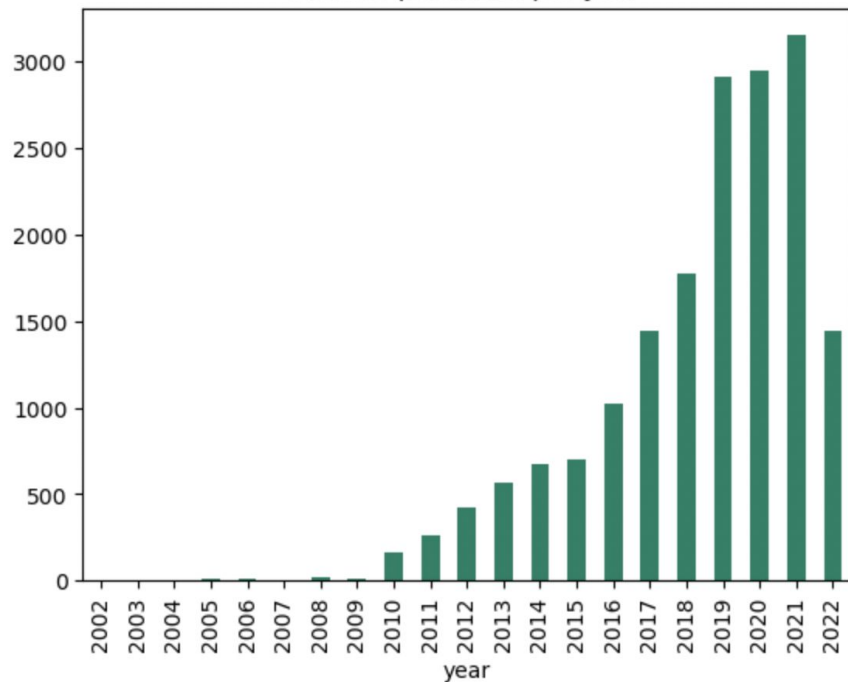- Trained on **social media** conversations (short texts)

Results: Sentiment analysis

- Sentiments per outlet (on article descriptions)

- Remarkable findings

  - Positive sentiment is most common for all outlets

  - Gizmodo: most negative and most positive, least neutral

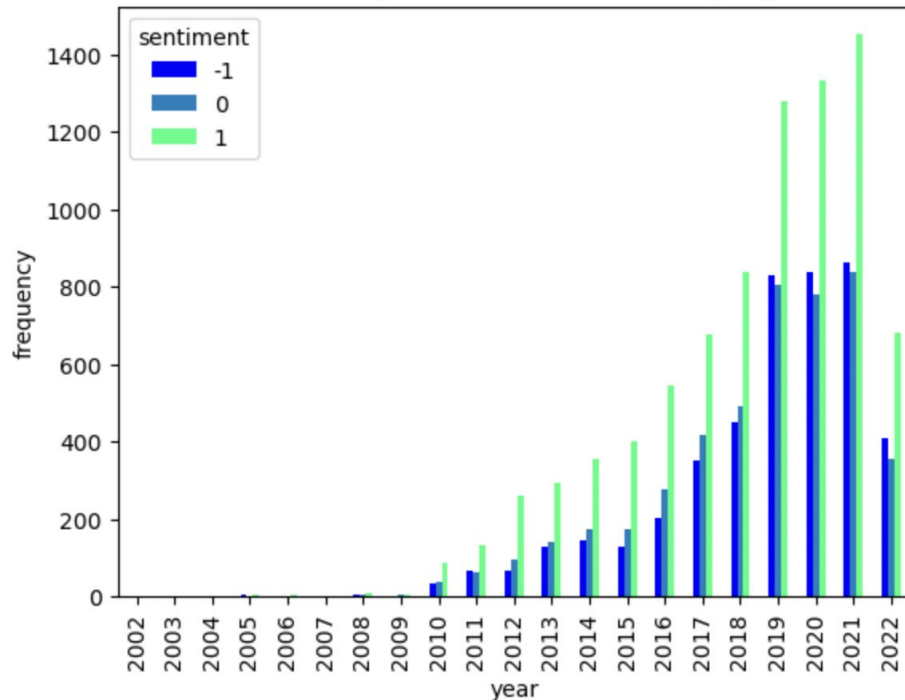 - NYT: least negative and least positive, most neutral

Article description VADER sentiments per outlet
(normalized counts)

Results: Sentiment analysis

Discussion: Interpretation

- Topics in **all** vs in **some** outlets

  Games vs China

- **Positive sentiment** is most common

  A.I. is new and exciting; focus on promising possibilities

- Gizmodo is **least neutral**

  Outspoken articles attract readers; entertaining

- NYT is **most neutral**

  Informative and balanced reputation holds true

Discussion: Limitations

- Topic analysis
  - Manual labeling of topics
  - Removal of stop words
- Sentiment analysis
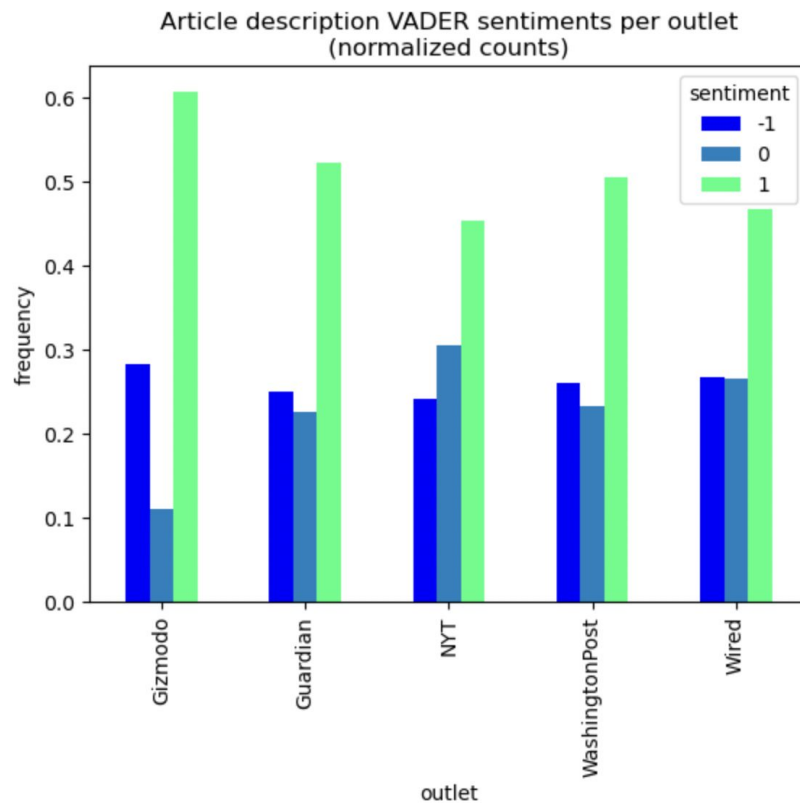 - Which sentiment analyzer works "best"?
- Imbalanced data

Concluding remarks

- **News outlets differ** in their framing of A.I. regarding topics and sentiment

  How exactly? We're not sure yet

- What's next?

  - **Combine** topic and sentiment analysis

  - **Remove stop words** → get more accurate topics

  - **Intercoder reliability** of sentiment analyzers
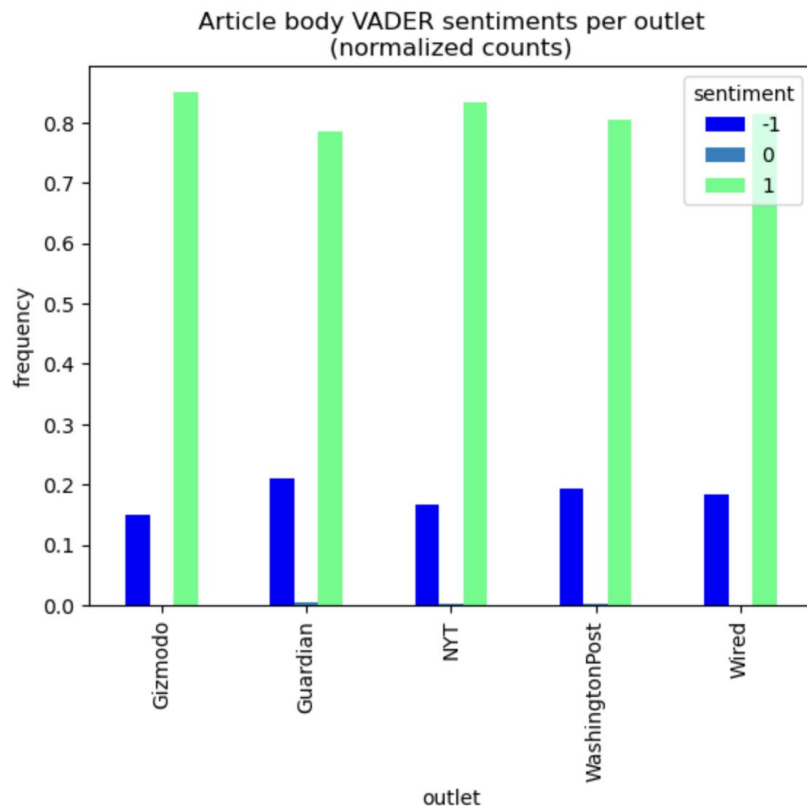
  - Try **k-Means per outlet**
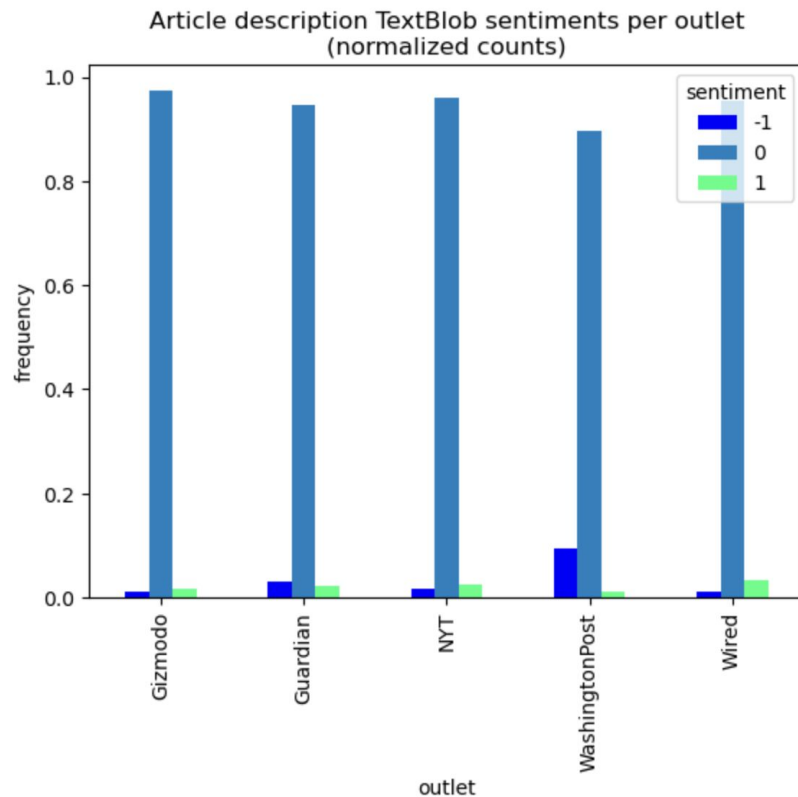
The End

Questions or Suggestions?

Extra: Plots

Article description VADER sentiments per outlet
(normalized counts)

Extra: Plots

Article body VADER sentiments per outlet
(normalized counts)

Extra: Plots

Article description TextBlob sentiments per outlet (normalized counts)

Extra: Plots

Article body TextBlob sentiments per outlet
(normalized counts)