Computational Narrative Framing:

Towards Identifying Frames through Contrasting the Evolution of Narrations

Reiter-Haas M., Klösch B., Hadler M., & Lex E.
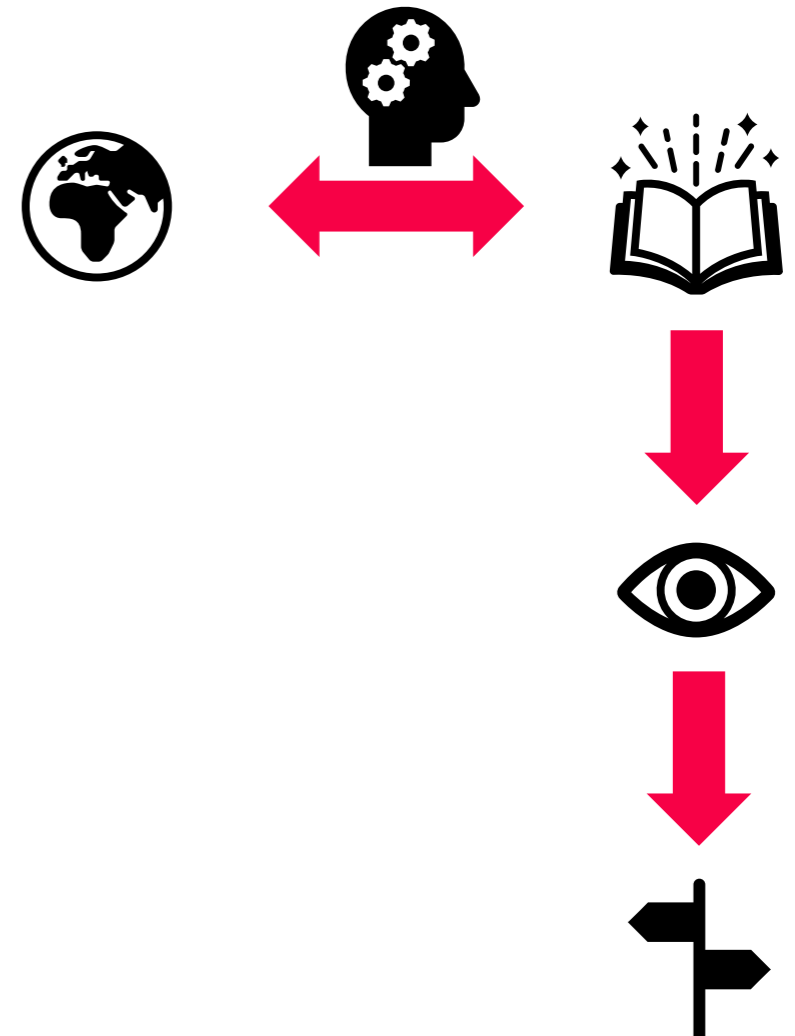
Text2Story 2024-03-24

https://socialcomplab.github.io/polarization/

How we perceive the world

Experiences and narratives are
linked neurologically

Using storytelling as framing device to
blend fiction and reality

Affecting our perception and choices

Framing through narrations: the case of climate change

Remember Global Warming?

Superseded by climate change

Heading towards climate catastrophe

Change in narrative elements? Actors, events, moral/reason

Narrations and Framing

The structure of narrations

Someone tells someone somewhere that || **someone did something(s) [to someone] somewhere at some time for some reason**

→ Narrating and Content

The salience of framing

Conceptualizations of Frames: Blame, War, Terrorists, Media, Moral, Frames, *and many more*

→ Semantic Information

The computational perspective

How can we extract, analyze and understand both?

And how can Transformers/LLMs etc. support this?

Computational Narrative Understanding / Computational Framing Analysis

Theory for CNU   **Survey for CFA**

Core challenges   Open questions

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Research Directions: Two Sides of the same Coin?

Narrative beliefs vs. capturing all relevant semantic relations

→ narrative structure

Narrative responses vs. Frames across multiple documents

→ competing narratives

Narrative economies vs. Salience through framing devices

→ temporal evolution

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Synthesizing Computational Narrative Framing

The combination has some preliminary work, but still sparse.

3 key requirements

*Narrative frames emerge from the **temporal** evolution of **collections** of documents comprising **structural** elements.*
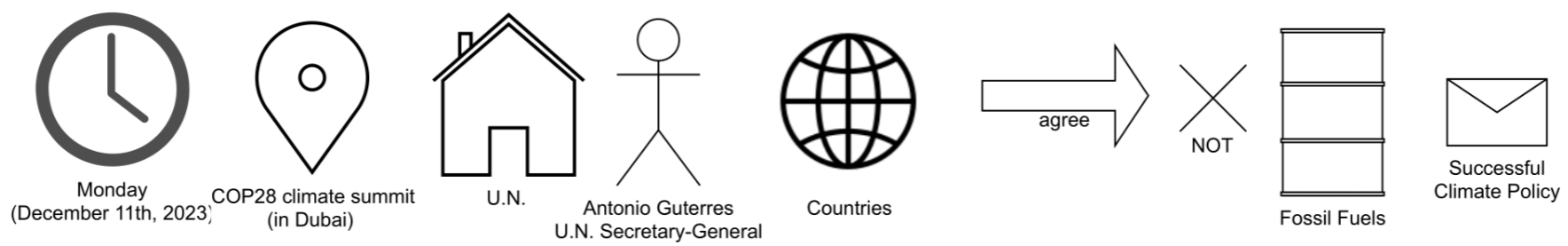
Narrative Structure

Semantic analysis

Semantic Frames

say-01

key-02

succeed-01

reach-01

agree-01

need-01

phase-01

Context

city

date-entity

monday

U.N. Secretary-General Antonio Guterres said on Monday (December 11th, 2023) one key to success of the COP28 climate summit (in Dubai) was for nations to reach agreement on the need to "phase out" fossil fuels.

Monday (December 11th, 2023) — COP28 climate summit (in Dubai) — U.N. — Antonio Guterres U.N. Secretary-General — Countries — agree — NOT — Fossil Fuels — Successful Climate Policy

Concepts

person

secretary-general

nation

cop28 summit climate

fuel fossil

organization

Named Entities

Antonio_Guterres

Dubai

United_Nations

(v6 / say-01 :ARG0 (v4 / person :name (v5 / name :op1 "Antonio" :op2 "Guterres") :wiki "Antonio_Guterres") :ARG1 (v3 / secretary-general) :ARG1 (v20 / nation :location (v19 / -rrb- :location (v17 / city :name (v18 / name :op1 "Dubai") :wiki "Dubai")) :domain (v11 / key-02 :quant 1 :ARG1 (v10 / -rrb-) :ARG1 (v12 / succeed-01 :ARG1 (v13 / cop28 :mod (v16 / -lrb- :mod (v15 / summit :mod (v14 / climate)))))) :ARG0-of (v21 / reach-01 :ARG1 (v22 / agree-01 :ARG1 (v23 / need-01 :ARG1 (v25 / phase-01 :ARG1 (v24 / ``) :ARG1 (v28 / fuel :mod (v27 / fossil) :mod (v26 / ")))))) :time (v9 / date-entity :day 11 :month 12 :year 2023) :poss (v8 / -lrb- :time (v7 / monday))) :ARG0 (v1 / organization :name (v2 / name :op1 "U.N.") :wiki "United_Nations"))

ISDS

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Competing Narratives

The clustering of narratives.

Contrasting them.

Weighting schemes.

The earth is getting warmer

Climate periodically changes

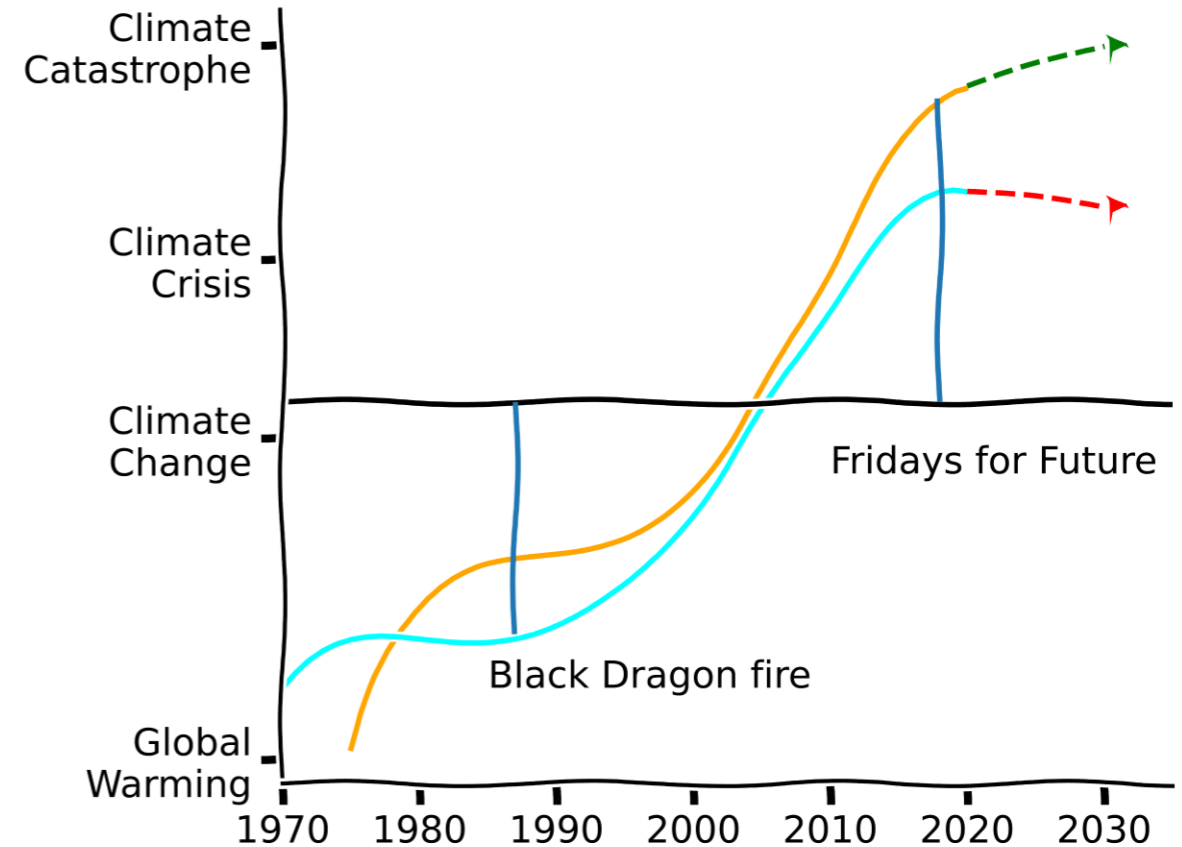Humans cause climate change

Temporal Evolution

Trajectories with events

Omissions?

Time-series and temporal modeling

Challenges in Narrative Framing Analysis

Lack of solid ground truth!

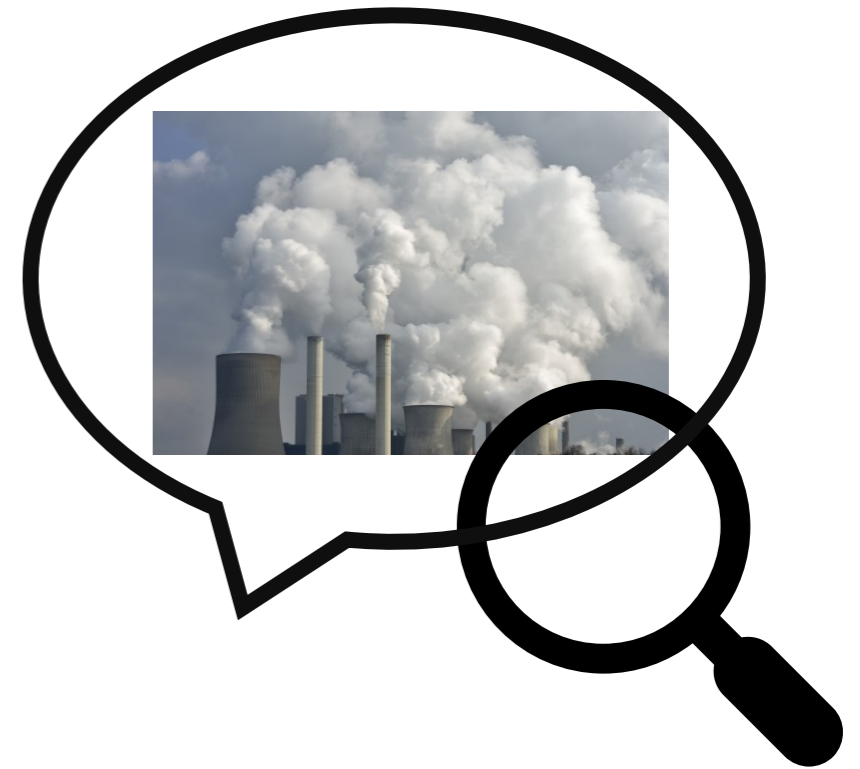Training and validation?

Not bounded, but emerging

Learning from Evolving Narratives: The Case of Global Warming to Climate Catastrophe

Gradual shift → reframing towards urgency

Anecdotal evidence vs. how to detect?

Support for discourse analysis

Mutual Benefit

Studying narrations AND framing computationally:

→ Broader understanding

Conclusion

Theoretical framework for computational narrative framing analysis and understanding

Impulse towards analysing narrations as long-term framing device

Conclusion

Theoretical framework for computational narrative framing analysis and understanding

Impulse towards analysing narrations as long-term framing device

$$CNU + CFA = CNF$$

Questions?

Main References

NeuroLink: Baldassano, C., Hasson, U., & Norman, K. A. (2018). Representation of real-world event schemas during narrative perception. *Journal of Neuroscience*, *38*(45), 9689-9699.

CNU: Piper, A., So, R. J., & Bamman, D. (2021, November). Narrative theory for computational narrative understanding. In *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing* (pp. 298-311).

CFA: Ali, M., & Hassan, N. (2022, December). A survey of computational framing analysis approaches. In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing* (pp. 9335-9348).

CNF Example: Reiter-Haas, M., Klösch, B., Hadler, M., & Lex, E. (2024). Framing Analysis of Health-Related Narratives: Conspiracy versus Mainstream Media. *arXiv preprint arXiv:2401.10030*.