UNIVERSITÄT LEIPZIG

Touché 2022 Best of Labs

Neural Image Retrieval for Argumentation

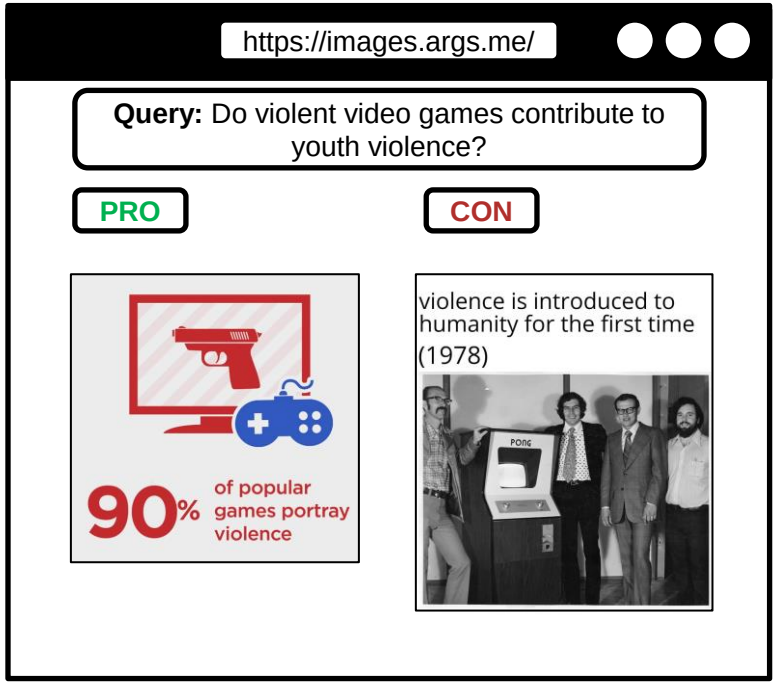
Thessaloniki, September 18-21, 2023

Tobias Schreieder and Jan Braker

ScaDS.AI DRESDEN LEIPZIG

CLEF 2023 Thessaloniki

Image retrieval for argumentation



Short description:

- User enters query with controversial question
- Retrieval system searches for argumentative images in corpus
- Division of images into pro and con

Touché 2022 – Image retrieval for arguments

TASK AND DEVELOPMENT PROCESS

Touché 2022 result:

- First shared task at CLEF 2022
- Consideration of a three-stage evaluation:
  - Topic-Relevance *(p@10 ~ 0.88)*
  - Argumentativeness *(p@10 ~ 0.77)*
  - Stance-Relevance *(p@10 ~ 0.43)*

Aramis at Touché 2022: Argument Detection in Pictures using Machine Learning (CLEF 2022)

On Stance Detection in Image Retrieval for Argumentation (SIGIR 2023)

Touché 2022 Best of Labs: Neural Image Retrieval for Argumentation (CLEF 2023)

Touché 2022 dataset

50 controversial topics

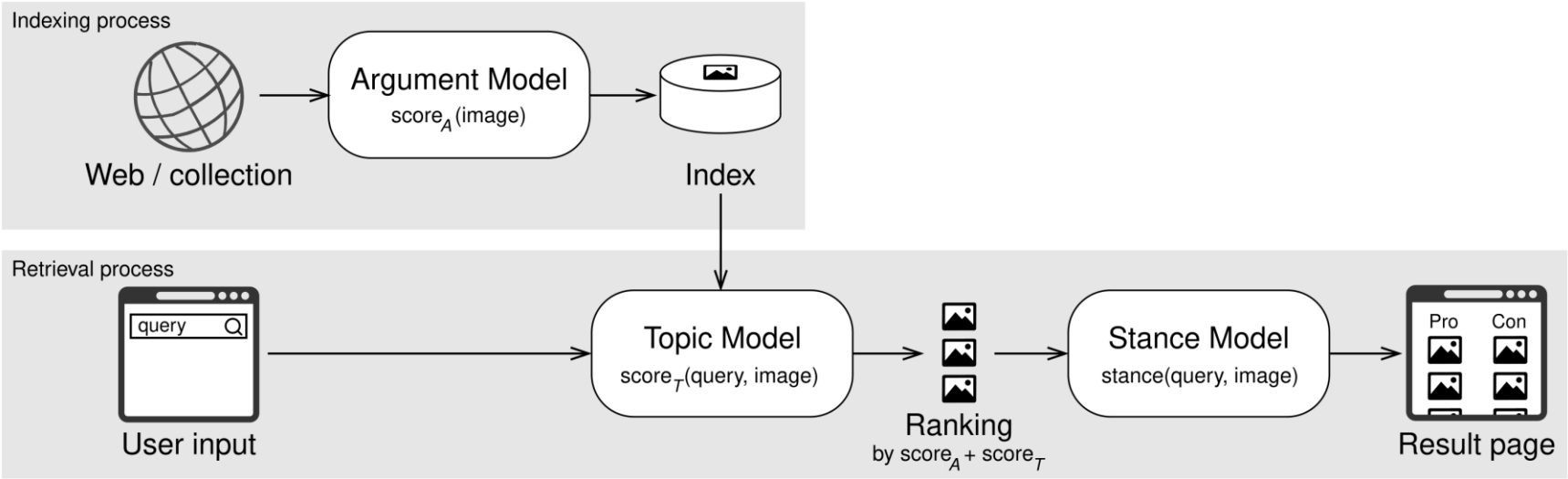
23,841 images

Data

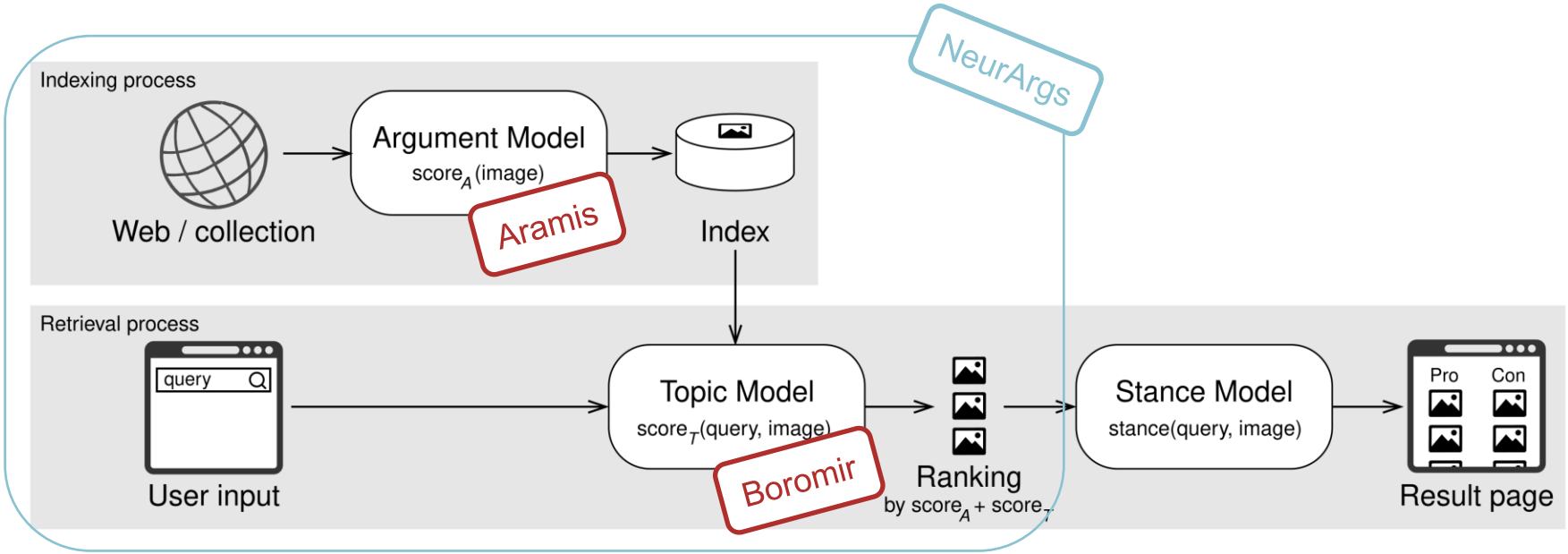
Image file, Web page screenshot, HTML source code, Image XPath

Relevance rating for 6,607 images

Our unified image retrieval system for arguments



Our unified image retrieval system for arguments



Selected model features

Color Features:

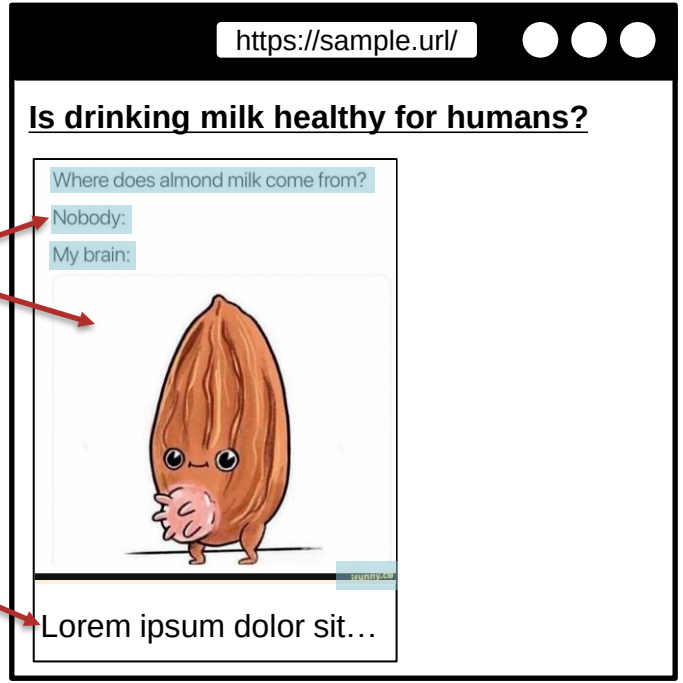
- Dominant Color: white

Text Recognition:

- Optical Character Recognition (OCR)
- Image Captions

Text Features:

- Text Position
- Text Area
- Text Length
- Sentiment Analysis



Stance models

Trivial

Random
- Random stance selection

NeurArgs
- Both side classification

Touché'22

Aramis Formular
- Features are given in formula

Aramis Neural
- Features are processed in feedforward network

Boromir
- Stance decision through website title classification

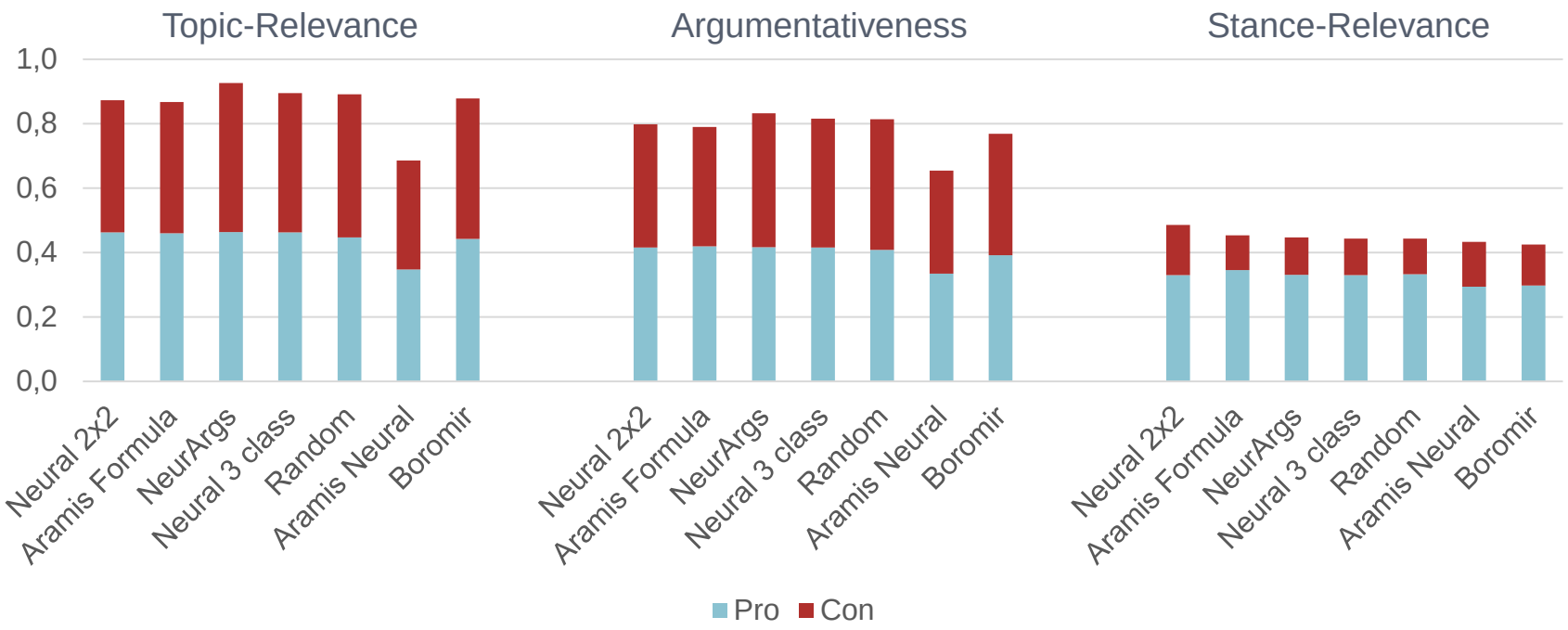
SIGIR'23

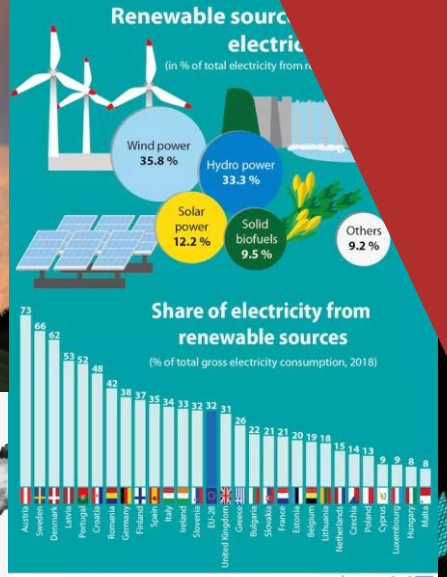
Neural 2x2class
- Pro model: True/False
- Con model: True/False

Neural 3class
- Model: Pro/Neutral/Con

Further Approaches

Evaluation


Topic-Relevance
Argumentativeness
Stance-Relevance
1,0
0,8
0,6
0,4
0,2
0,0
Neural 2x2
Aramis Formula
NeurArgs
Neural 3 class
Random
Aramis Neural
Boromir
Pro
Con



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THE RELATION OF BIRTH ORDER TO SEXUAL ORIENTATION IN MEN AND WOMEN

RAY BLANCHARD, KENNETH J. ZUCKER, MARVIN SIEGELMAN, ROBERT DICKEY AND PHILIP KLASSEN

Clarke Institute of Psychiatry, Toronto, Ontario, Canada

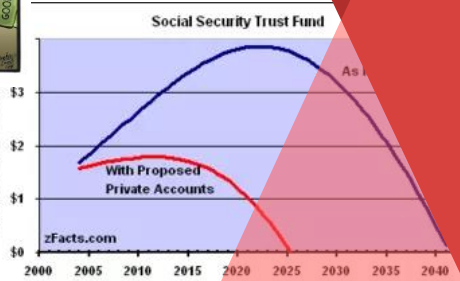
Summary. Homosexual men have a higher mean birth order than do heterosexual men, primarily because they have a greater number of older brothers. The purpose of this study was to determine whether the same difference occurs in homosexual vs heterosexual women. The probands were 964 homosexual and heterosexual, male and female volunteers, from whom birth order data were collected with self-administered questionnaires. The homosexual men had more older brothers than the heterosexual men, but they did not have more older sisters, younger brothers, or younger sisters. The homosexual women did not differ from the heterosexual women with regard to any class of sibling. These results are consistent with the hypothesis that the high birth order of homosexual men reflects the progressive immunization of certain mothers to H–Y antigen by succeeding male fetuses, and the increasing effects of H–Y antibodies on sexual differentiation of the brain in succeeding male fetuses.

Introduction

In a study of patients at London's Maudsley Hospital, Slater (1962) found that homosexual men tend, on average, to be born late in their sibships. Slater's observation was confirmed in a second series of patients from the same hospital (Hare & Moran, 1979) and subsequently in controlled studies of homosexual vs heterosexual men in clinical and non-clinical samples from Canada (Blanchard & Bogaert, 1996a; Blanchard & Sheridan, 1992; Blanchard *et al.*, 1995), the United States (Blanchard & Bogaert, 1996b; Blanchard & Zucker, 1994; Zucker & Blanchard, 1994), and the Netherlands (Blanchard *et al.*, 1996). The more recent studies have established that homosexual men have a higher mean birth order than heterosexual men because they have a greater number of older brothers; they do not have a greater number of older sisters, once their number of older brothers has been taken into account (Blanchard & Bogaert, 1996a,b). This phenomenon might therefore be described as the fraternal birth-order effect.

Because of the finding that older sisters have no influence on the sexual orientation of later-born males, Blanchard & Bogaert (1996a) suggested that male homosexuality

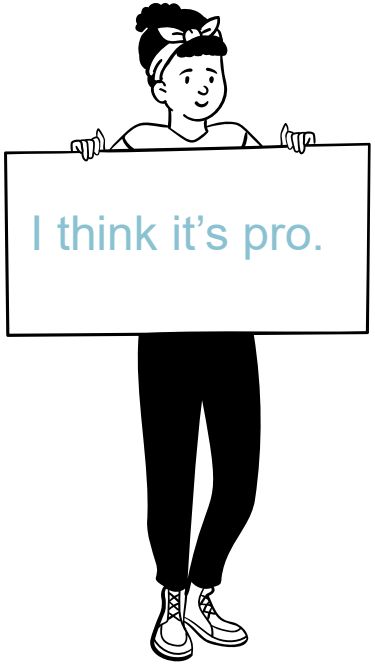
. . .

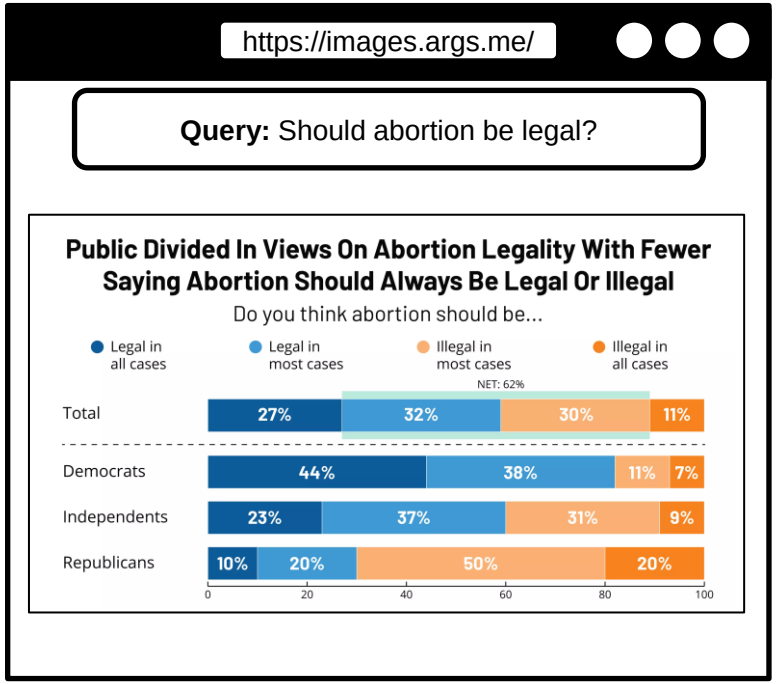


Insights into Image Stance Detection

WHY IS STANCE DETECTION SO CHALLENGING?

1. Different valuations cause stance ambiguity





2. Image understanding depends on background knowledge

No Background Knowledge:

"Burning field"

-> Not topic-relevant

https://images.args.me/

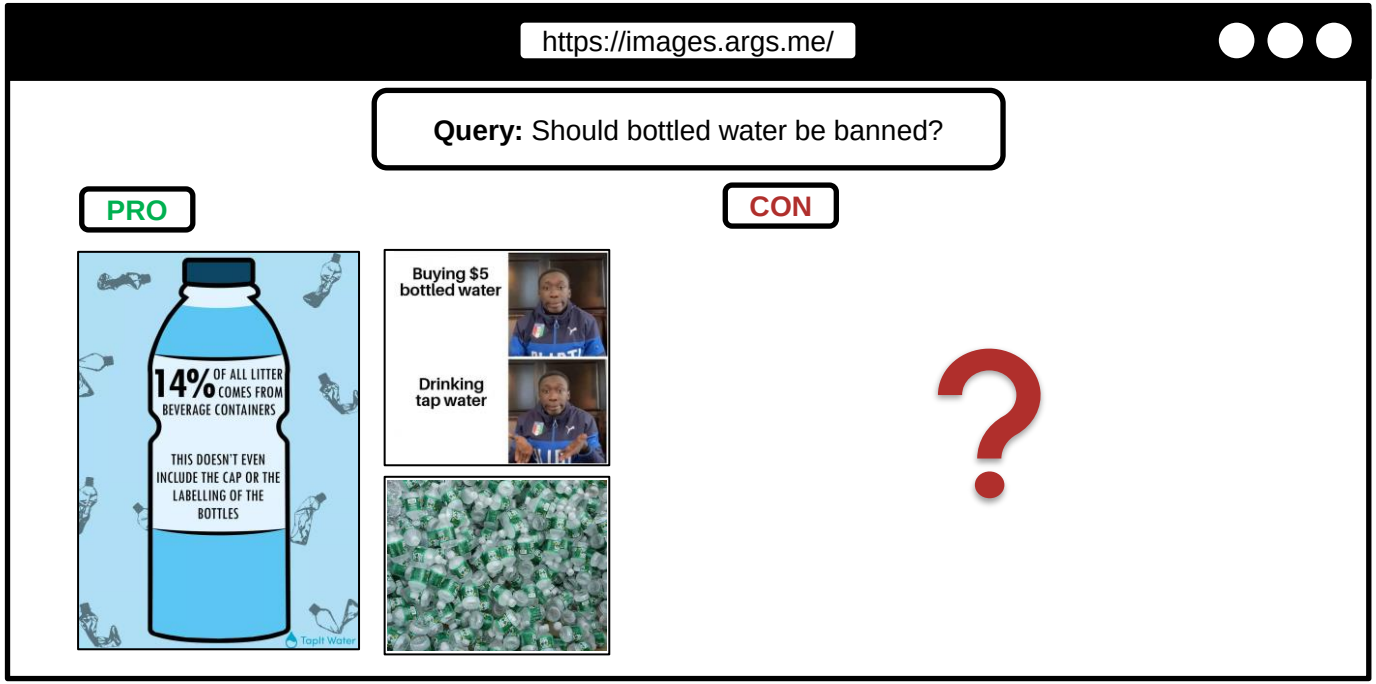
Query: Is human activity primarily responsible for global climate change?

Background Knowledge:

"Burning of forests and fields in Brazil intensifies climate change"

-> Pro

3. Unbalanced image stance distribution



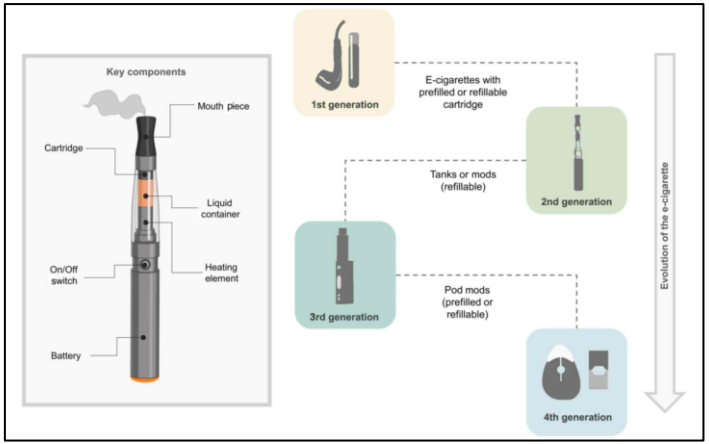
4. Neutral images

https://images.args.me/

Query: Should body cameras be mandatory for police?

https://images.args.me/

Query: Is vaping with e-cigarettes safe?



5. Irony und jokes

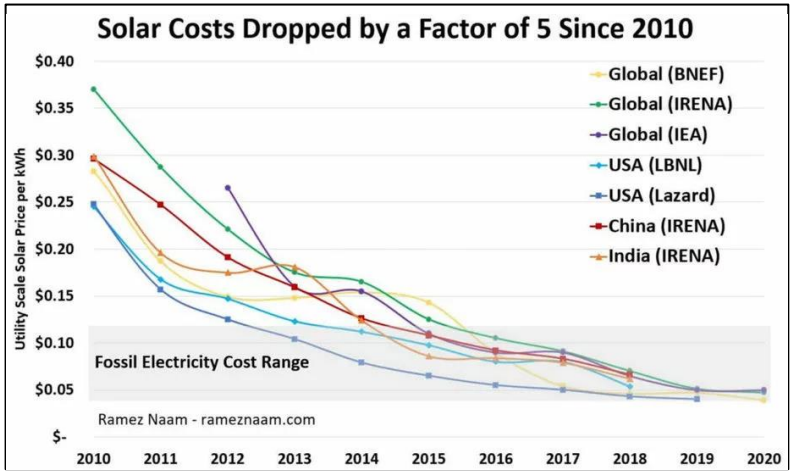
https://images.args.me/

Query: Do violent video games contribute to youth violence?

6. Semantic gap for diagrams

https://images.args.me/

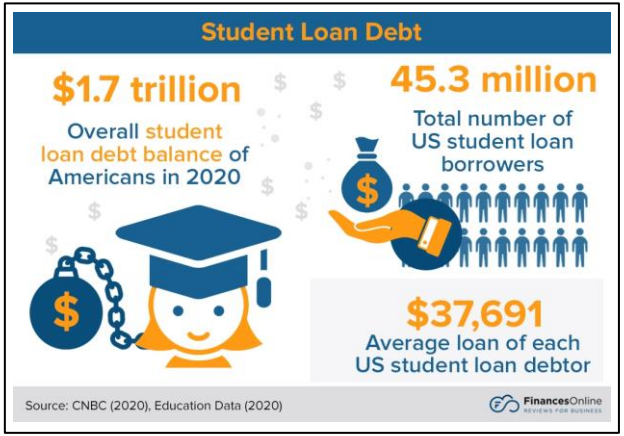
Query: Can alternative energy effectively replace fossil fuels?

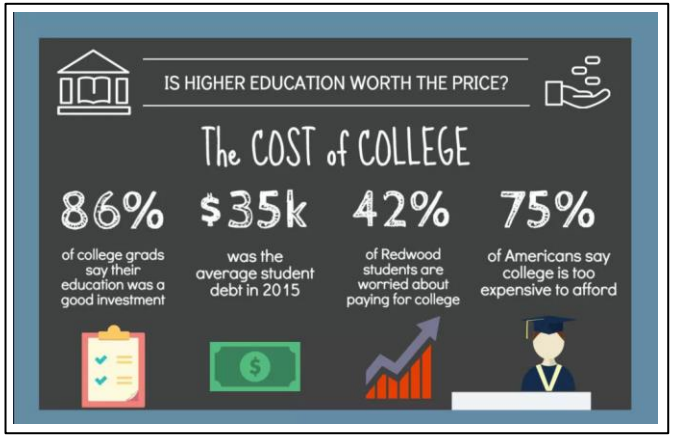


7. Regional images

https://images.args.me/

Query: Is college education worth it?





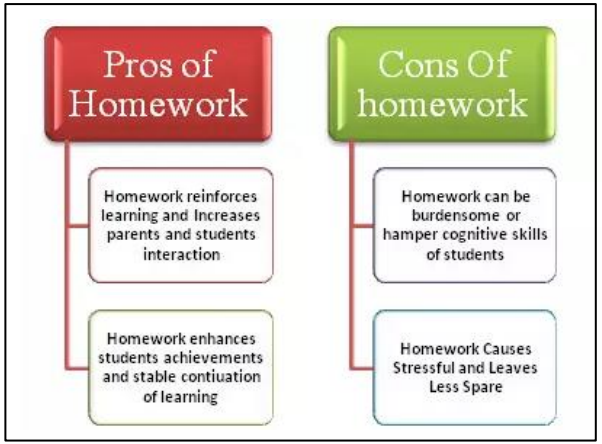
8. Both stances in one image

https://images.args.me/

Query: Is a college education worth it?

https://images.args.me/

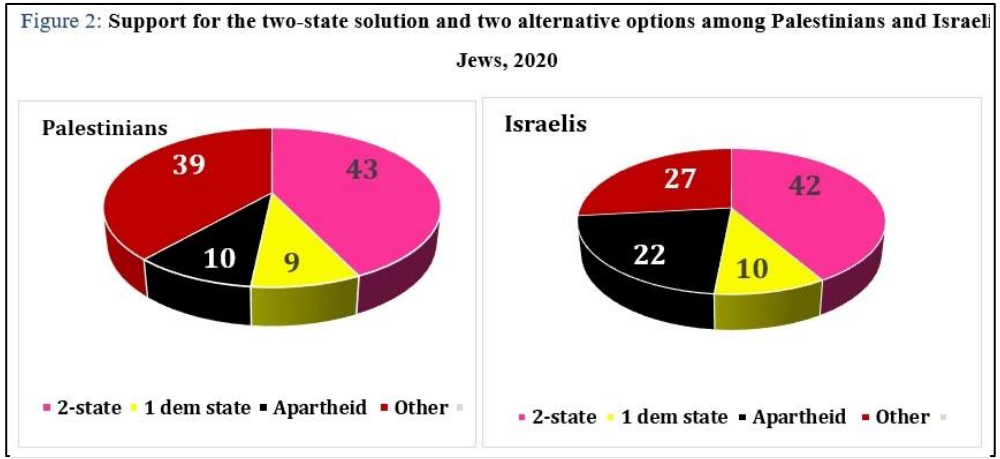
Query: Is homework beneficial?



9. More than two stances

https://images.args.me/

Query: Is a two-state solution an acceptable solution to the Israeli-Palestinian conflict?



Lessons learned

The modular image retrieval system NeurArgs works very well for finding topic-relevant and argumentative images (new state-of-the-art)

None of the 8 reproduced or new approaches can significantly beat a random baseline at stance detection

Stance detection of images remains an unsolved problem

Identified 9 different challenges for stance detection

THANKS!

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