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Climate Protests:
More Harm than Good?

Analysis of the effects of climate protests on the opinion and sentiment of the public

Contents

- Motivation and Problem
- Goals
- Related Work
- Collected Data
- Preliminary Results
- Roadmap

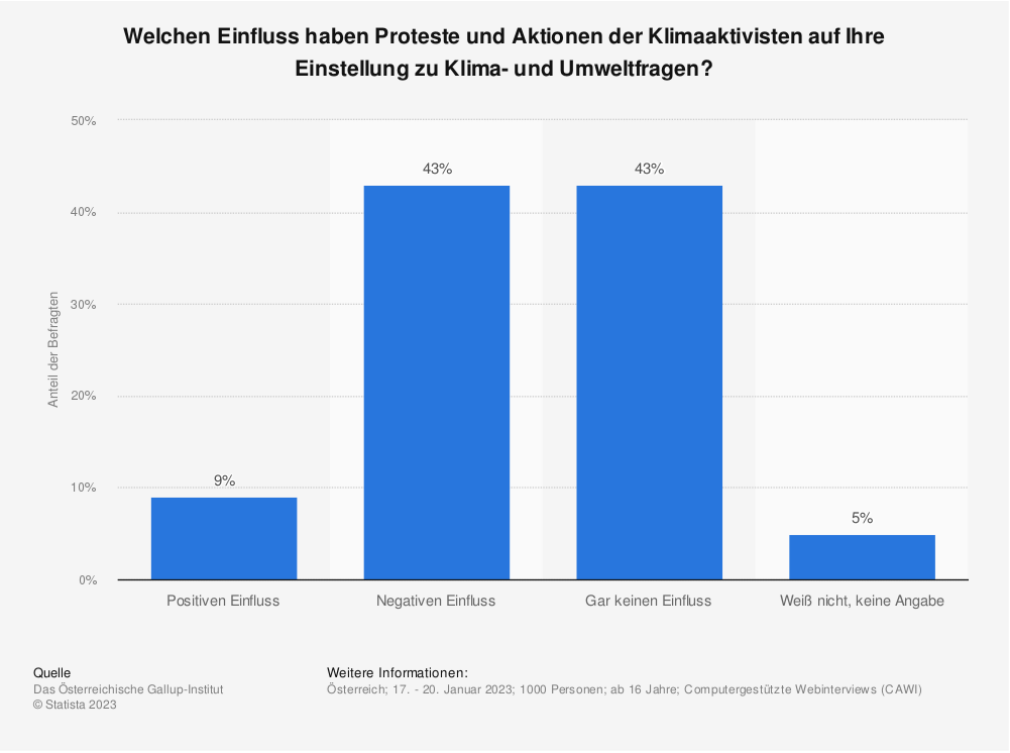
Motivation

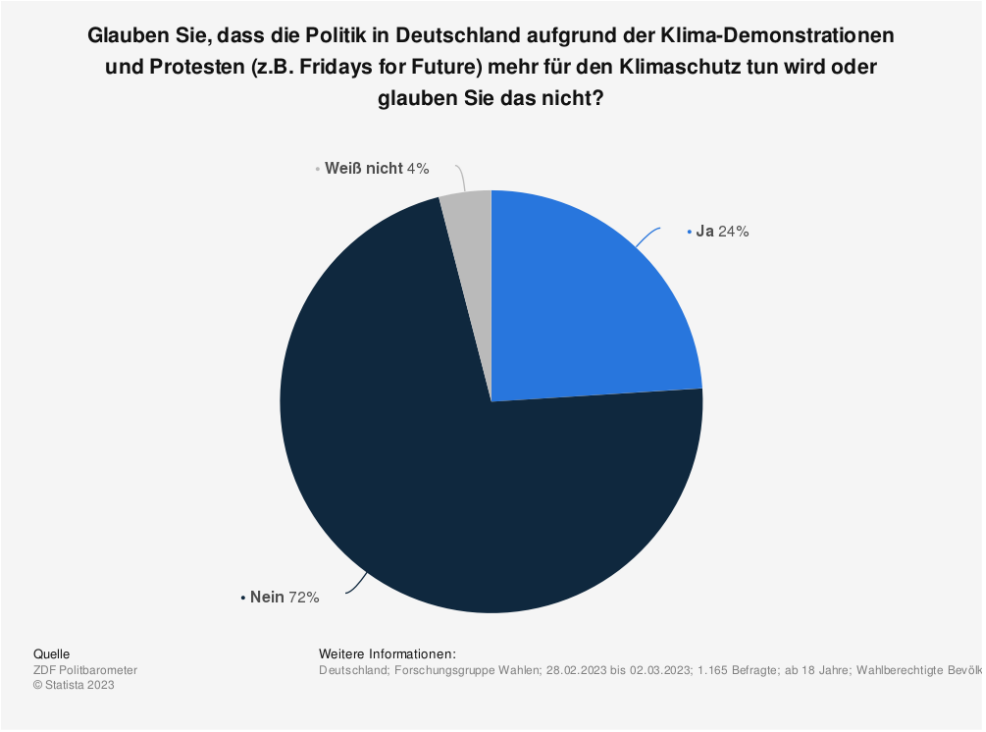
- Climate protests are all over the (German) news:

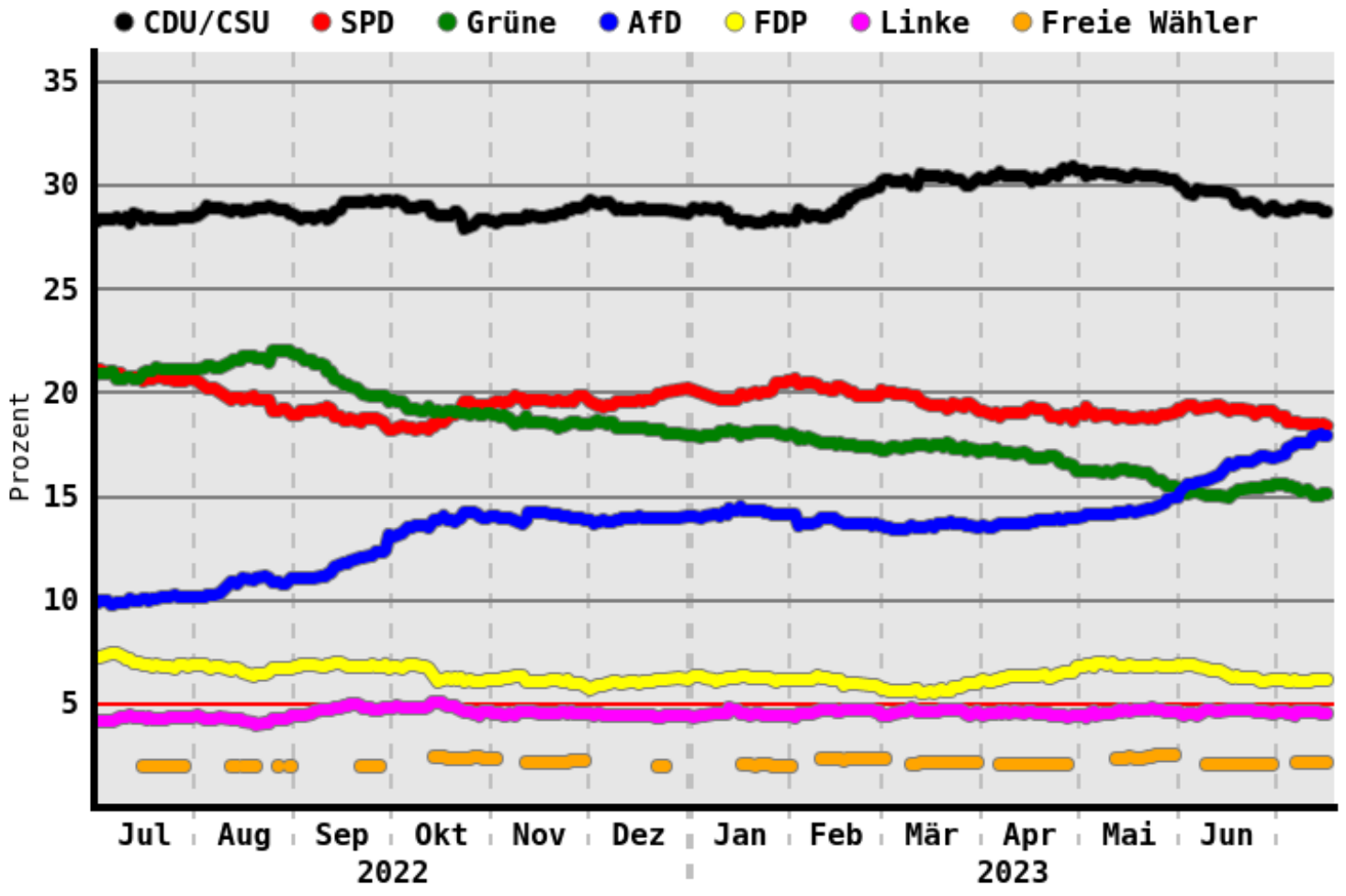
  - Letzte Generation, Fridays for Future, Klimakleber etc.
- Very high urgency climate crisis
- Political action is lacking → cause for climate protests
- Biggest problem humanity has ever faced?

Problem

- Do the climate protests actually benefit the cause?



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2023

Are climate protests useless?

- Potentially adverse effects
- Most big social movements were first met by resent, but succeeded eventually

- Motivation to empirically research sentiment on Twitter, as this has not been done before

Goals

- Be able to tell how climate protests affect public opinion and sentiment
- Find ‘most effective’ form of climate protests

Related work

- Climate Change Sentiment on Twitter: An Unsolicited Public Opinion Poll (Cody et al., 2015):
  - Dataset containing keyword ‘climate’ from 2008 to 2014
  - ‘Hedonometer’ to measure Happiness
  - Tweets containing ‘climate’ consistently yield lower happiness-scores
  - After natural disasters (Hurricane Sandy 2012): lowest happiness
  - Forward on Climate Rally (2013): Only time that happiness is above average happiness

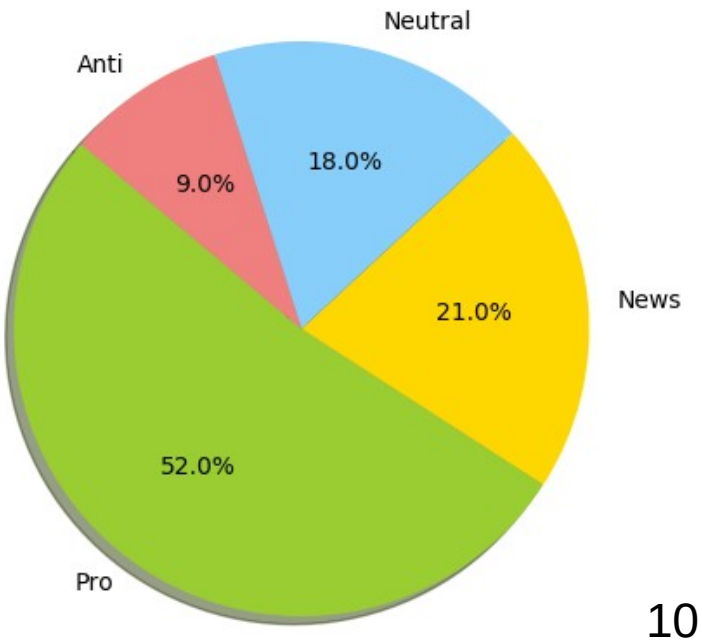
    → Indicator for positive sentiment during climate protests

Related work

- The climate change Twitter dataset (Effrosynidis et al., 2022):
  - Dataset containing 15 million tweets from 2006 to 2019
  - Geolocation, temperature deviation, gender, stance (believer/denier), aggressiveness, topic
  - Temperature higher than average → more aggressive tweets
  - Deniers use term ‘global warming’ more than ‘climate change’ and use more aggressive language
  - People connect warmer temperatures more with climate change than colder temperatures
  - Deniers more present in American Region, South Africa, Japan, and Eastern China, less present in Europe, India and Central Africa
  - Most concerned tweets when extreme weather is witnessed

Twitter Climate Change Sentiment Dataset

- Best existing labeled dataset for belief in human-made climate change (used by Effrosynidis et al.)
- 43.943 tweets labeled by 3 reviewers



Problem with previous work

- All focused on whether a person believes in human-made climate change or denies it

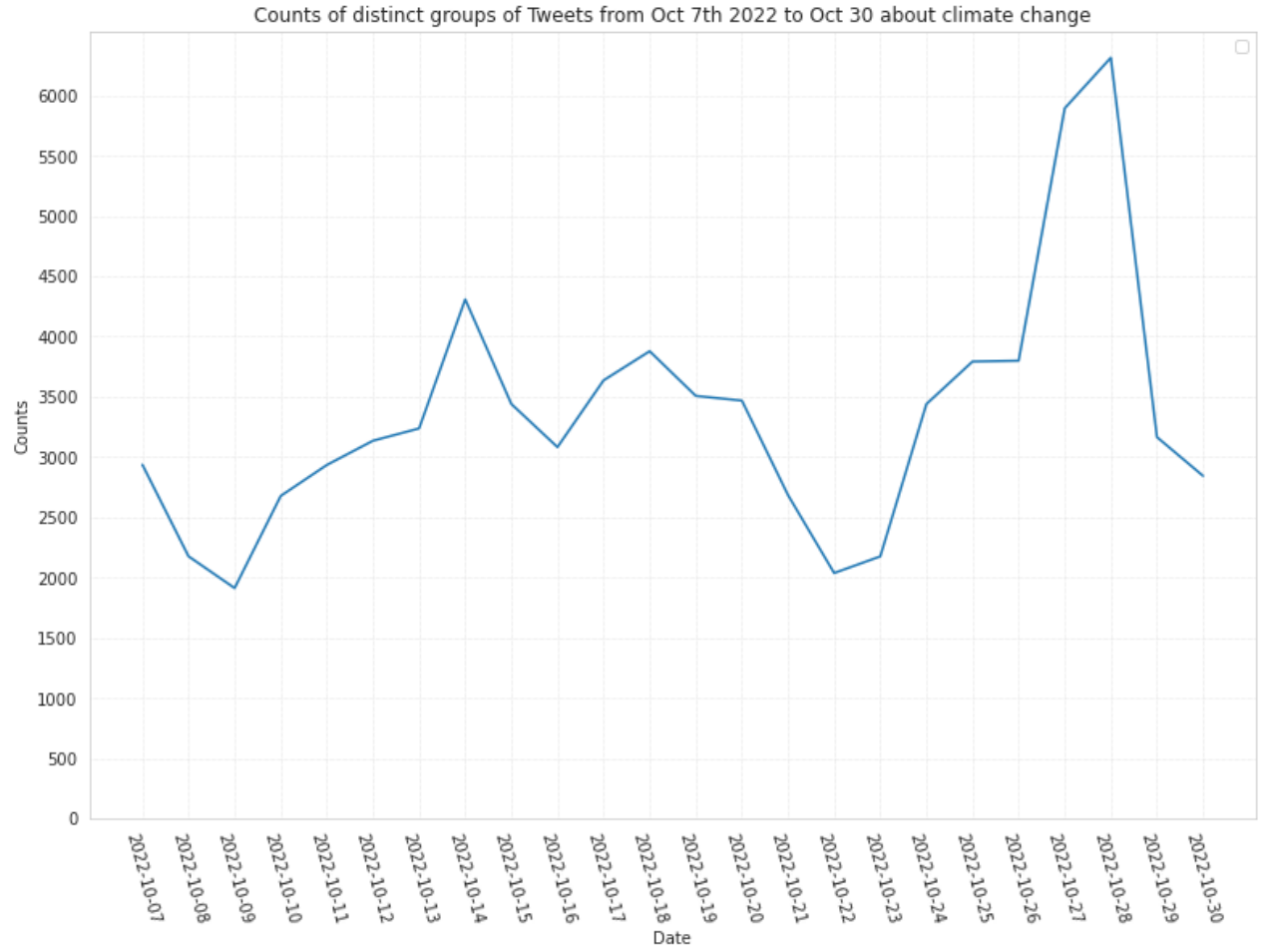
- My research interest:
  Does a person support climate action or not?

  → new classifier is required

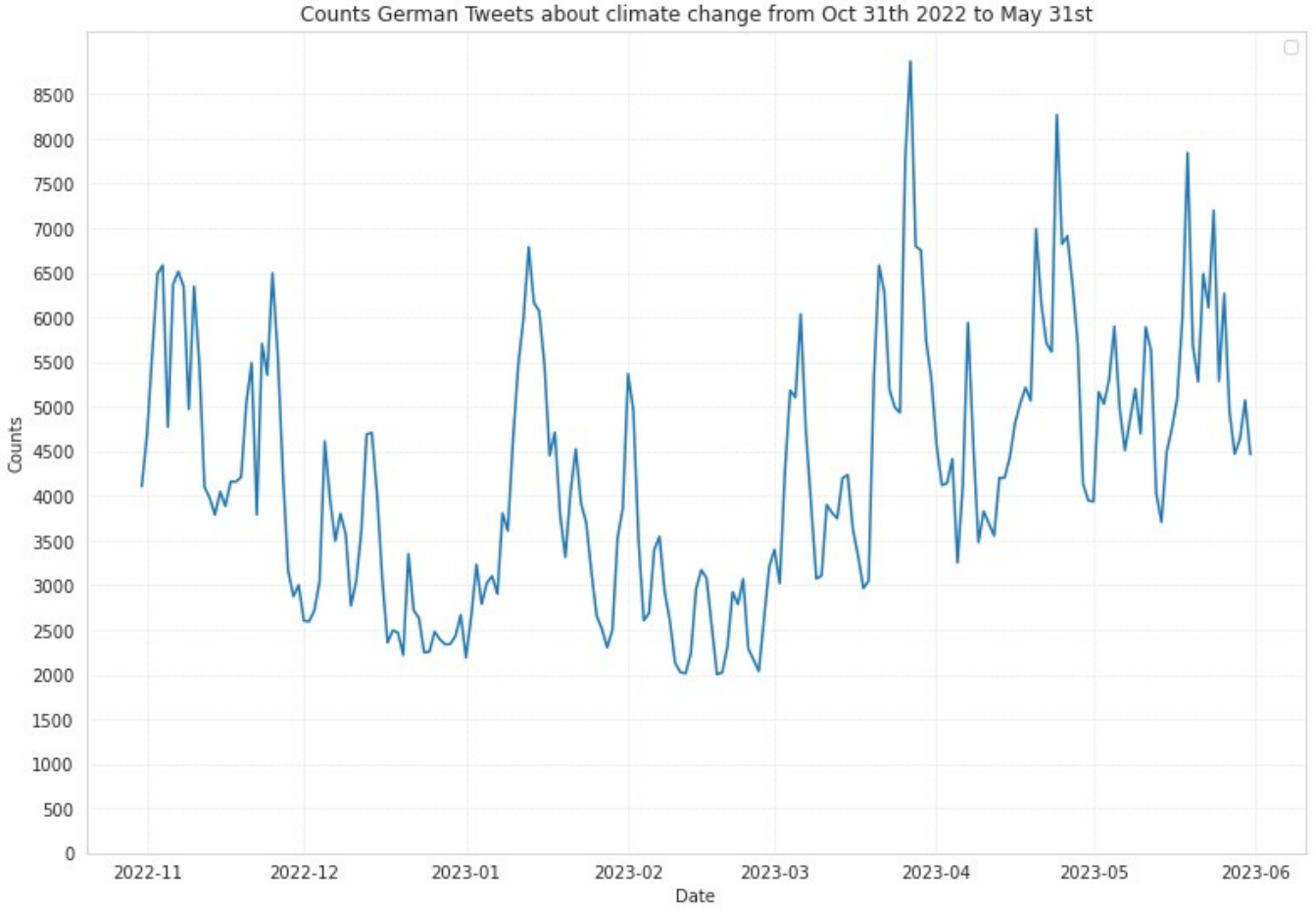
My collected data

- snscrape library was used for scraping tweets
- English and German tweets from Sep 1 2022 to May 31 2023
- Keywords:
  - Klimawandel, Klimakrise, Erderwärmung, Klima
  - Climate change, climate crisis, global warming, climate
- ~1 million German tweets, ~4 million English tweets
- Very tedious and troublesome task, over 30 runs of scraping

Preliminary results



Preliminary results



Google Trends

- Klimawandel

- Climate action

Methods

- BERT was the most successful approach for classifying stance in previous work (Effrosynidis et. Al, 2022)
- Will focus on Transformer-Based approaches like BERT
- Trained one Albert model with existing labeled dataset (https://huggingface.co/robookwus/climate-change-belief)
- Plan to use larger models (Flan-T5-XXL) to improve results

Transfer Learning

- Abundance of pre-trained models that classify Tweets, e.g. huggingface.co/cardiffnlp
- Great opportunities for transfer learning
- Fine-tuning, experimenting, finding best approaches

Roadmap

July	August	September
Literature review, scraping Twitter Dataset	Train classifier (climate action) with self-set labels. Compare sentiment before/after climate protests	Add further information with transfer learning, find correlations between data points
October	**November**	**December**
Finish up experiments, start writing	Writing	Writing

Roadmap

- 3 different Classifiers:
  - Believer/Denier of human-made climate change
  - Supervised classifier based on self-labeled data
  - Create clusters of persons that either always support climate action or are always against it, use all their tweets to train classifier

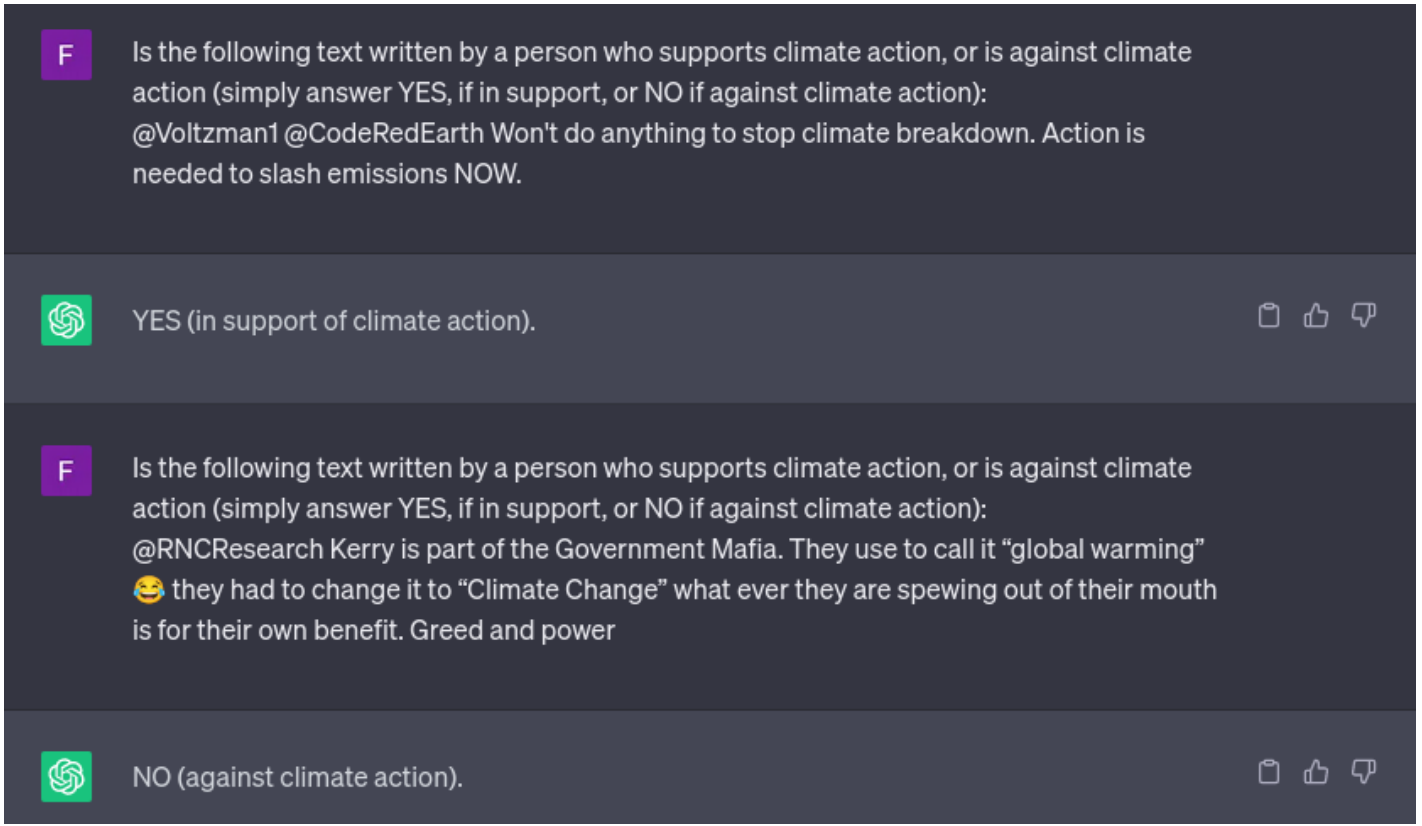
Roadmap

- Labeling samples of my dataset in a binary fashion (pro/against climate action)
- 100 English, 100 German labeled Tweets first
- 1000 English, 1000 German labeled Tweets next
- Train different models with the labeled data

  → find the best model

- Compare Zero-shot, Few-shot learning results with my supervised models

Zero-Shot Learning



Few-shot learning

- Small dataset (1-100 labeled examples) can be used to fine-tune existing models
- Comparisons between many different approaches to be made
- How ‘smart’ are current language models (e.g. ChatGPT)? Do they even need further infortmation and fine-tuning?

Roadmap

- Add further information to my dataset, e.g. sentiment of tweet, aggressiveness, hate-speech
- Use pre-trained models for this task
- Correlations between stance and e.g. sentiment can be made

Roadmap

- Check sentiment before/during/after climate protests
- How do protests affect public sentiment/opn
- Find correlations between data points
- Check and cross-reference with other sources (News and Reddit)

Bonus Goals

- Find the most effective class of climate tweets (e.g. that has the most likes, or most positive responses)
- Create a chatbot that is trained with these most effective tweets and also grounded in climate science (chatclimate.ai)

Conclusion

- Aggregated big Twitter dataset in a time of frequent climate protests
- Predict if a person supports climate action
- How climate protests affect results
- Check correlation with other data points