Extractivism

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MONA

Interdisciplinary research into activist events

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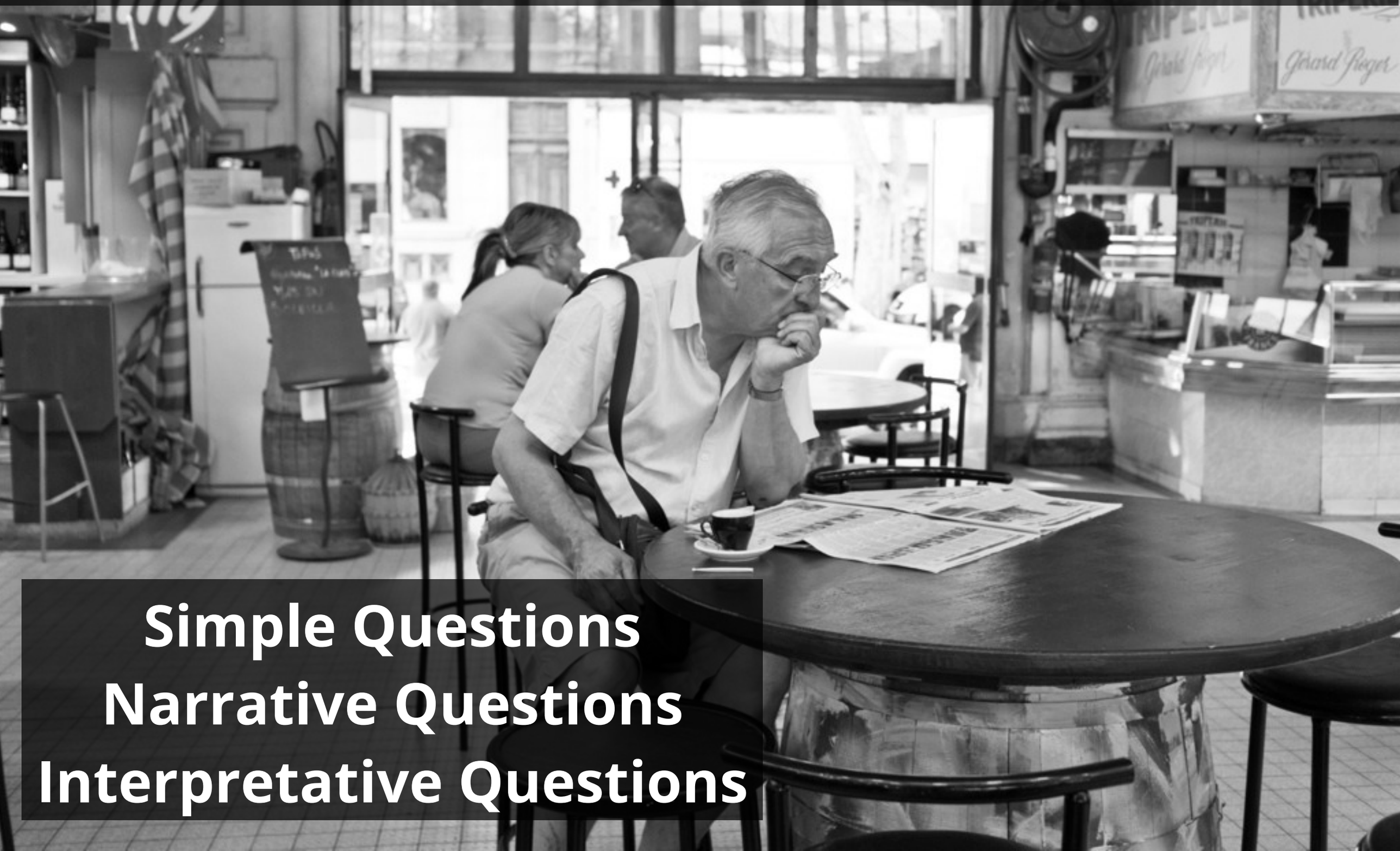
Why?

Activists shape the future by influencing opinions and policies

How?

Read news articles, identify the events activists participate in



Simple Questions
Narrative Questions
Interpretative Questions

Problems

Answering these types of questions is difficult for various reasons

Processing and aggregation is time consuming

Individual news articles may lack context and present an incomplete and biased story

Ideally

Automatically extract event mentions from multiple news sources

Store them in a structured format to enable aggregation

Present statistics and visual overviews such as timelines

Research Goals

Explore semantic models for storing and interpreting events

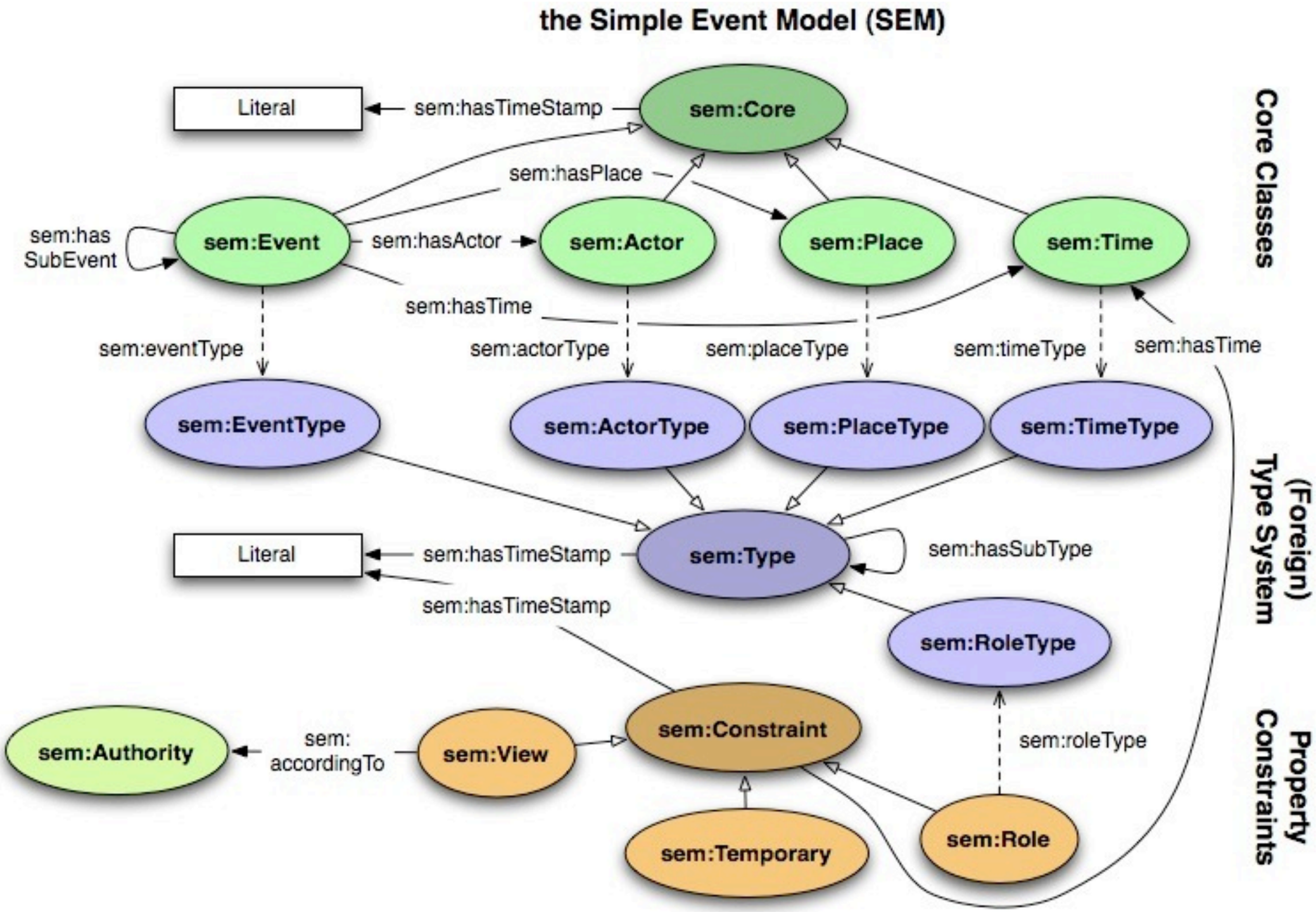
Build (semi)-automated tools to support question answering

NLP Tools for extraction

Visual Analytics for browsing

SEM

An ontology to describe events in terms of "Who did what, where and when?" (Van Hage 2011)



Extraction

Are there any existing methods we can re-use?

Gene and protein interactions from molecular biology papers

Illegal migration events from news articles for border security

Football events for creating match summaries

Extraction | Our method for extracting activist events

TextRazor

Stanford University NLP Natural Language Processing

Article Text

1 *Sentence Splitting + Word Tokenization*

Tuesday Greenpeace protested against Shell in London

Extraction | Our method for extracting activist events

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Part-of-Speech Tagging

Tuesday	Greenpeace	protested	against	Shell	in	London
NNP	*NNP*	*VBD*	*IN*	*NNP*	*IN*	*NNP*
		EVENT				

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Named Entity Recognition

Tuesday	Greenpeace	protested	against	Shell	in	London
DATE	*ORG*			*ORG*		*LOC*
TIME	**ACTOR**			**ACTOR**		**PLACE**

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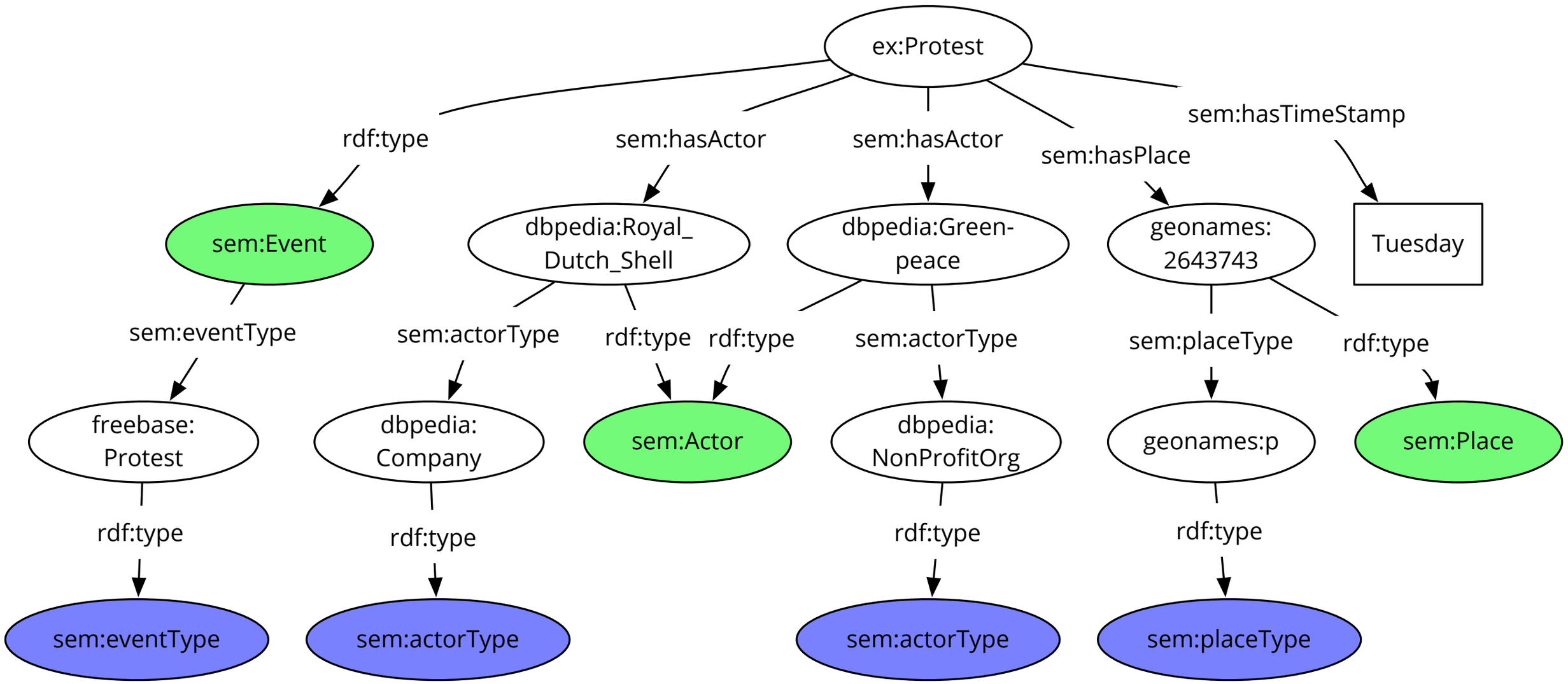
Dependency Parsing

Extraction | Our method for extracting activist events

Extraction | Resulting SEM Event

"Tuesday Greenpeace protested against Shell in London."



Evaluation | Experimental Setup

45 articles concerning arctic oil exploration

A variety of sources, including NYT, Guardian, and Amnesty

Annotated by domain experts to create a gold standard

Evaluation | Inter-rater agreement

Annotators	Event	Actor	Place	Time
1	46%	35%	36%	28%
2	34%	32%	28%	43%
3	20%	33%	36%	20%

Results | Performance Measurements

We extracted 1829 events, 1609 actors, 772 places, and 456 times

	Event	Actor	Place	Time
Precision	71.00%	46.00%	36.00%	65.00%
Recall	58.00%	35.00%	54.00%	60.0%

Errors

Low Place Precision
Low Actor Recall

"Shell is working with wary **United States** regulators."

"The **European Union** has long shown leadership on the issue of climate change"

Errors | Low Actor Recall

"The **Kulluk Oil Rig** was used for test drilling last summer."
"The Coast Guard flew over **the rig** for a visual inspection."

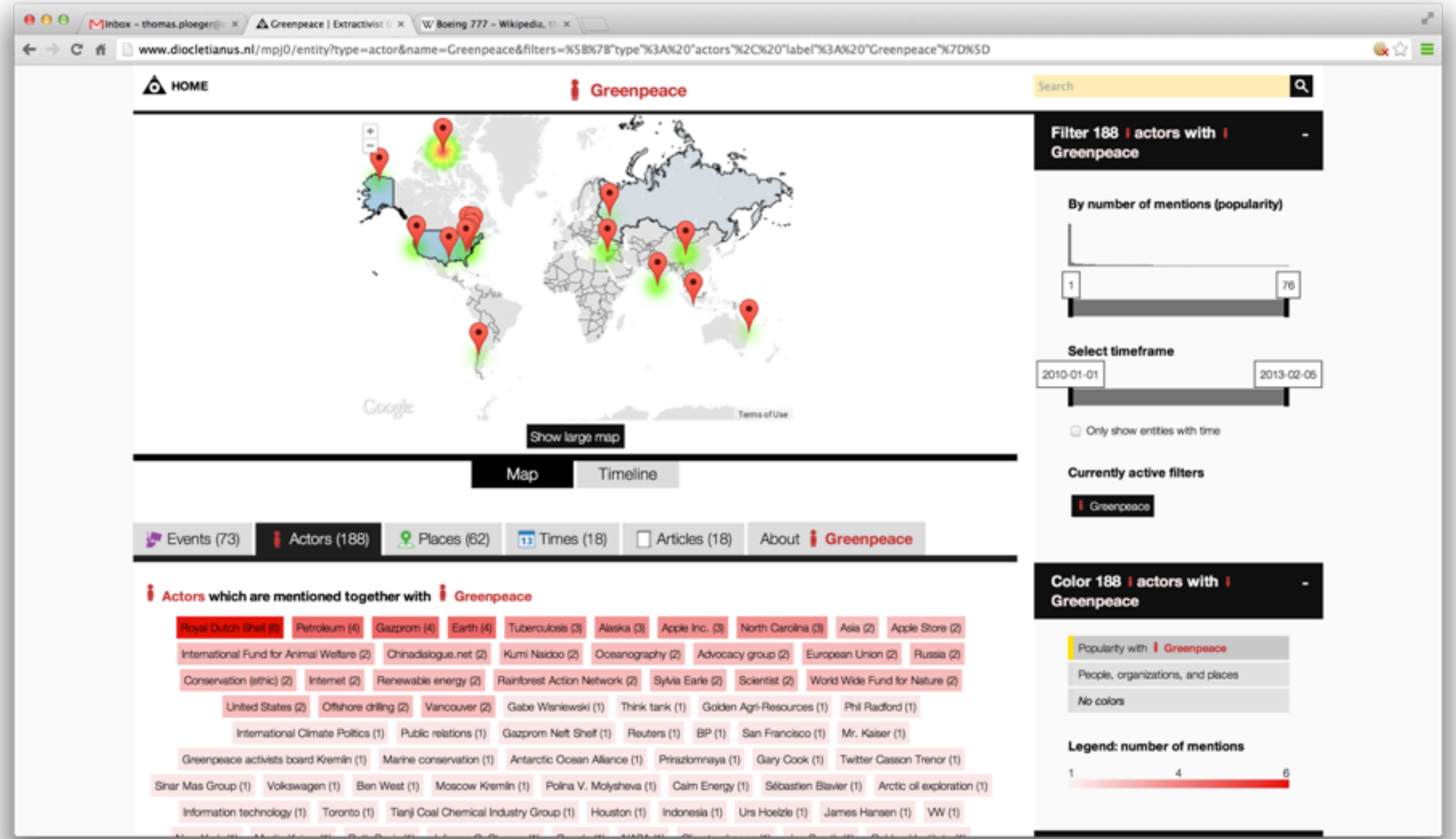
"**Scientists** say the drilling may influence..."

Errors | Gold Standard Annotation Instructions

Task was too loosely defined, resulting in different interpretations

Annotator	Event F1	Actor F1	Place F1	Time F1
1	63%	41%	49%	57%
2	54%	44%	19%	35%
3	60%	43%	48%	61%

Visual Analytics



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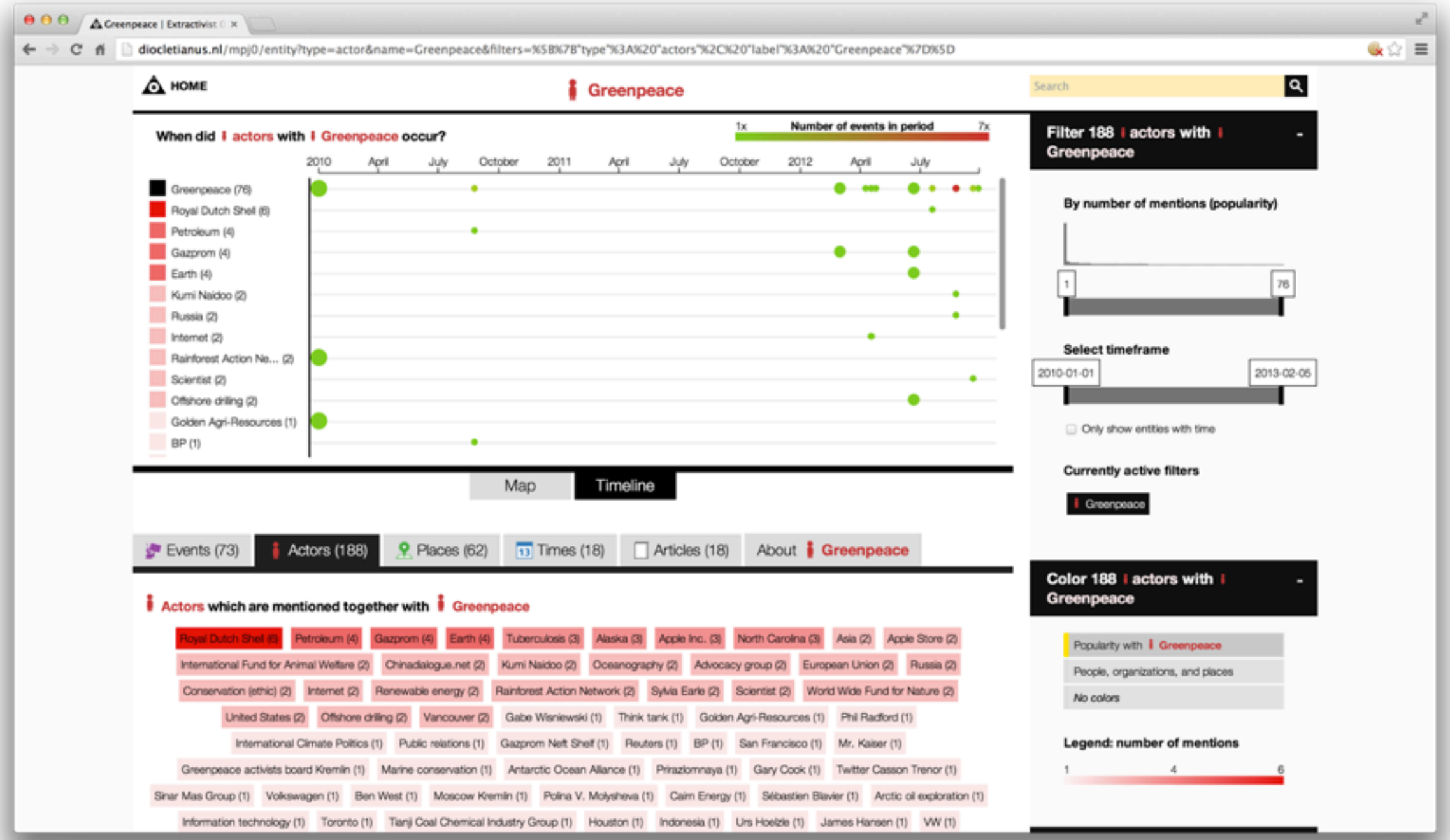
Visual Analytics



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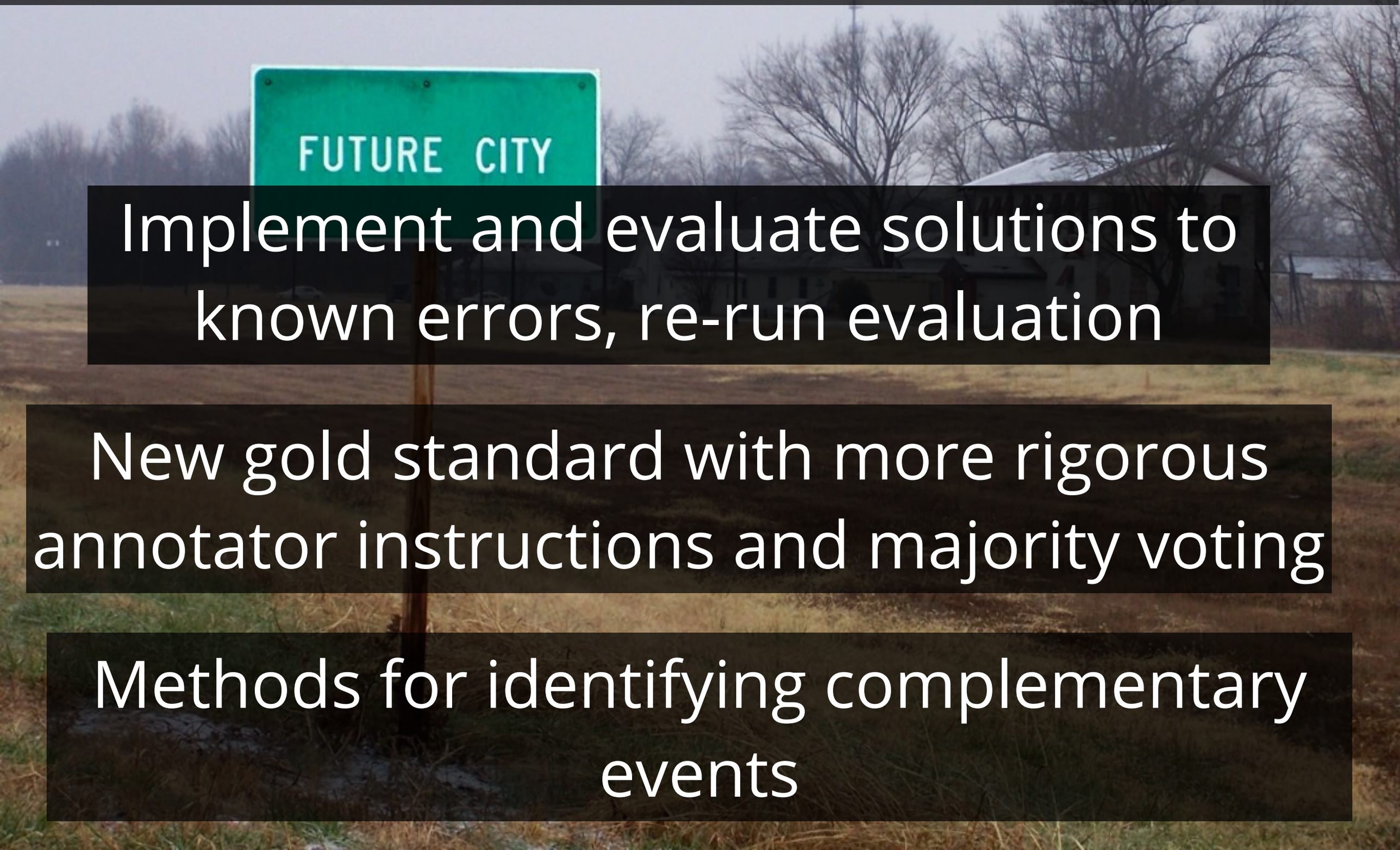
Lessons Learned

Off-the-shelf NLP tools yield useful, but imperfect results with little domain-specific tuning

Minimally constrained notion of event makes it difficult to instruct annotators

...and to fine-tune extraction process.

Future Work



Implement and evaluate solutions to known errors, re-run evaluation

New gold standard with more rigorous annotator instructions and majority voting

Methods for identifying complementary events

Recap

Study activists, they shape the future by influencing opinions and policies

Used a pipeline of off-the-shelf NLP tools to extract events

Extracted events used in visual analytics to answer questions

Loose event definition is challenging to annotate and fine-tune

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Discussion | Tentative example

Shell oil rig ran aground in the Gulf of Alaska on the 31st of December 2012

18 days later, United States government expresses concerns about Shell's operational accidents and impact on the environment

A few months later, Shell is granted a permit to begin drilling oil wells in Alaska, despite his earlier concerns