

MWW-DARIAH Workshop

Analyse und Visualisierung

KONTEXTVOLATILITÄT - HOT TOPICS

25.05.18

Christian Kahmann, Prof. Dr. Gerhard Heyer
Universität Leipzig

GLIEDERUNG

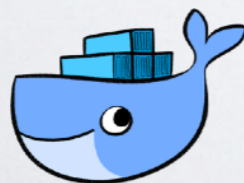
- Explorative Suche
- Kurzvorstellung iLCM
- Kontextvolatilität?
- Anwendungsbeispiel

EXPLORATIVE SUCHE

- Klassisch: Finden von Dokumenten, welche Informationen enthalten, die dem Informationsbedarf des Nutzers entsprechen
- Explorativ:
 - Suche in Dokumentenmenge nach auffälligen Themen, Konzepten, Akteuren oder Ereignissen
 - Wie ändert sich die Bedeutung von Konzepten über die Zeit?

ILCM

- integrierte Forschungsumgebung zur Analyse großer Mengen an Daten mittel Text-Mining Verfahren
- Nutzung von Technologien wie: docker, R-Shiny, MariaDB, spaCy und Solr
- Website: <https://ilcm.informatik.uni-leipzig.de/>



ILCM

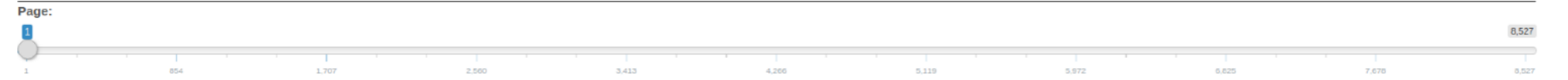
iLCM

- Explorer
- which corpus?
GU
- Collection Worker
- Categories
- Scripts
- Importer

Search Results | Time Series | Document View | Facets

85263 Documents were found!

id	score	section	title	author	date	token	keyword.and.context	keep
1481578	21.20913	Environment	On Trump and climate, America is split in two by these demographics Dana Nuccitelli	0	2016-11-14	1399	sharply divided on Trump along the same lines as its sharp divisions on climate change . Political ideology	<input checked="" type="checkbox"/>
1519224	21.215256	Environment	Liberals have a responsibility too: make climate change a top issue	0	2017-06-06	1773	on its own tier above all others, shared perhaps with nuclear war only climate change is already	<input checked="" type="checkbox"/>
1497118	21.219368	Opinion	In Australia and the US, sound climate policy is being held hostage by vested interests	0	2017-02-06	940	change . Related: Turnbull's new climate and energy adviser worked for coal industry lobby group For	<input checked="" type="checkbox"/>
1528683	21.289751	US news	Al Gore: 'The rich have subverted all reason'	0	2017-07-29	3263	well, what Donald Trump is to climate change denial. Disaster zone: destruction in the wake of	<input checked="" type="checkbox"/>
1455670	21.293362	Film	James Cameron calls Donald Trump a 'madman' over climate change denial	0	2016-07-28	366	saved for Trump himself, who is shown at various rallies ridiculing the idea of climate change . We need	<input checked="" type="checkbox"/>
1534627	21.374605	Science	'Not too bright': Trump trolled for staring at the eclipse with no eye protection	0	2017-08-22	456	real.Trump: Climate change is a hoaxScientists: Don't look at the sun during #SolarEclipse2017 Trump	<input checked="" type="checkbox"/>
1485231	21.39274	Environment	Climate change will stir 'unimaginable' refugee crisis, says military	0	2016-12-01	684	climate denial is just one of the forces that point towards war George Monbiot Climate change impacts	<input checked="" type="checkbox"/>
1542328	21.555788	Environment	The war on coal is over. Coal lost Dana Nuccitelli	0	2017-10-16	1279	was the historically irresponsible decision to withdraw from the Paris climate agreement, joining war	<input checked="" type="checkbox"/>
1514011	21.573536	Environment	EPA wipes its climate change site as protesters march in Washington	0	2017-04-29	613	about climate change : 'They are done with the denial' The Trump administration has called for budget	<input checked="" type="checkbox"/>
1549374	21.585407	Environment	On climate and global leadership, it's America Last until 2020 Dana Nuccitelli	0	2017-11-13	1163	campaign. He also took the standard Trump administration line on climate change , acknowledging only that	<input checked="" type="checkbox"/>



Simple | Detailed | Custom

Keyword
trump#(climate+change)#war

Use raw text

Date von:
2013-01-01

Date bis:
2017-12-31

Publisher:
all

Type:
all

Section:
all

Number of Token:

Search

Save Collection

Collection Name:
test

Save Collection

I L C M

iLCM
☰

Search Results
Time Series
Document View
Facets

Date
2013-07-26

Publisher
0

Token
662

Section
Environment

Page
0

Language
eng

Author
0

ID
1169503

POS-TAGS

- None
- PROP
- NOUN
- PUNCT
- ADP
- NUM
- PRON
- VERB
- ADJ
- PART
- ADV
- DET
- CCONJ
- SYM

Entity-TAGS

- None
- GPE
- CARDINAL

Reuters' climate-change coverage 'fell by nearly 50% with sceptic as editor'

Twitter road trips [USA](#) : [Las Vegas](#) to [Denver](#) , day four as it happened . Nigerian human rights groups claim Senator [Ahmed Yerima](#) 's child bride undermines protection for legal status of children . Reuters ' climate - change coverage fell by nearly 50 % after a climate sceptic joined the news agency as a senior editor , a study has found . The sharp decline in coverage since 2011 , recorded by the Media Matters for America advocacy group , reinforces charges from a former staffer that Reuters cut back on climate stories under the influence of [Paul Ingrassia](#) , who is now the agency 's managing editor . Media Matters found a 48 % decline in climate - change coverage over a six - month period , after [Ingrassia](#) joined the agency in 2011 . The New York Times and other news organisations have cut back on climate coverage , closing down blogs and redeploying correspondents , at times citing financial constraints . However , Bloomberg , Reuters ' main competitor , has deepened its investment in climate change and sustainability coverage . The agency 's founder , [New York](#) mayor Michael Bloomberg , has been a strong advocate for action on climate change . Charges of an ideological component to Reuters ' declining coverage related to [Ingrassia](#) 's personal doubts about established climate science have sharpened concern in media and environmental as well as business circles , because of the agency 's focus on financial news . " It is just not responsible in our opinion to be cutting back on an issue that is having such a profound impact on every sector of the economy , " said Mindy Lubber , who heads the Ceres sustainable business network , which represents companies and investors controlling some \$ 11tn in assets . " This is a financial risk that needs to be looked at and addressed . " The Climate Progress blog has since criticised Reuters for injecting references in stories to fringe groups that reject established climate science , and represent barely 3 % of scientists publishing on climate change . The news agency did not respond specifically to the findings of a deep cut in climate - change coverage . But in an emailed statement , a spokesperson wrote : " Reuters covers climate change closely both as a scientific and public - safety issue , as well as the impact of climate change on businesses , the economy and the markets . We have a dedicated staff , including a team of specialist reporters at Point Carbon and a columnist , who all generate significant coverage on the topic across our various platforms . We remain committed to providing fair and independent coverage of climate change that complies fully with our Trust Principles . " The scrutiny of Reuters ' climate - change coverage began earlier this month when David Fogarty , the former Asia Climate Change Correspondent , wrote in a blog post that climate - change coverage had been dramatically cut back after [Ingrassia](#) 's hire . Fogarty , a 20-year veteran at Reuters , covered climate change for four and a half years . But early last year it became increasingly difficult to get climate - change stories published . Editors suggested he pursue other stories . Then Fogarty described a conversation with [Ingrassia](#) , then deputy editor , at a social event . " In April last year , Paul Ingrassia then deputy editor - in - chief and I met and had a chat at a company function . He told me he was a climate - change sceptic . Not a rabid sceptic , just someone who wanted to see more evidence mankind was changing the global climate . " Progressively , getting any climate change - themed story published got harder . It was a lottery . Some desk editors happily subbed and pushed the button . Others agonised and asked a million questions . Debate on some story ideas generated endless bureaucracy by editors frightened to take a decision , reflecting a different type of climate within Reuters the climate of fear . " By mid - October , I was informed that climate change just was n't a big story for the present , but that it would be if there was a significant shift in global policy , such as the [US](#) introducing an emissions cap - and - trade system . Very soon after that conversation I was told my climate change role was abolished . " Fogarty left the agency soon after . Disclosure : the Guardian is a Reuters client .

Annotations

Which Annotation Scheme?

stadt land fluss

Person

Ort

Land

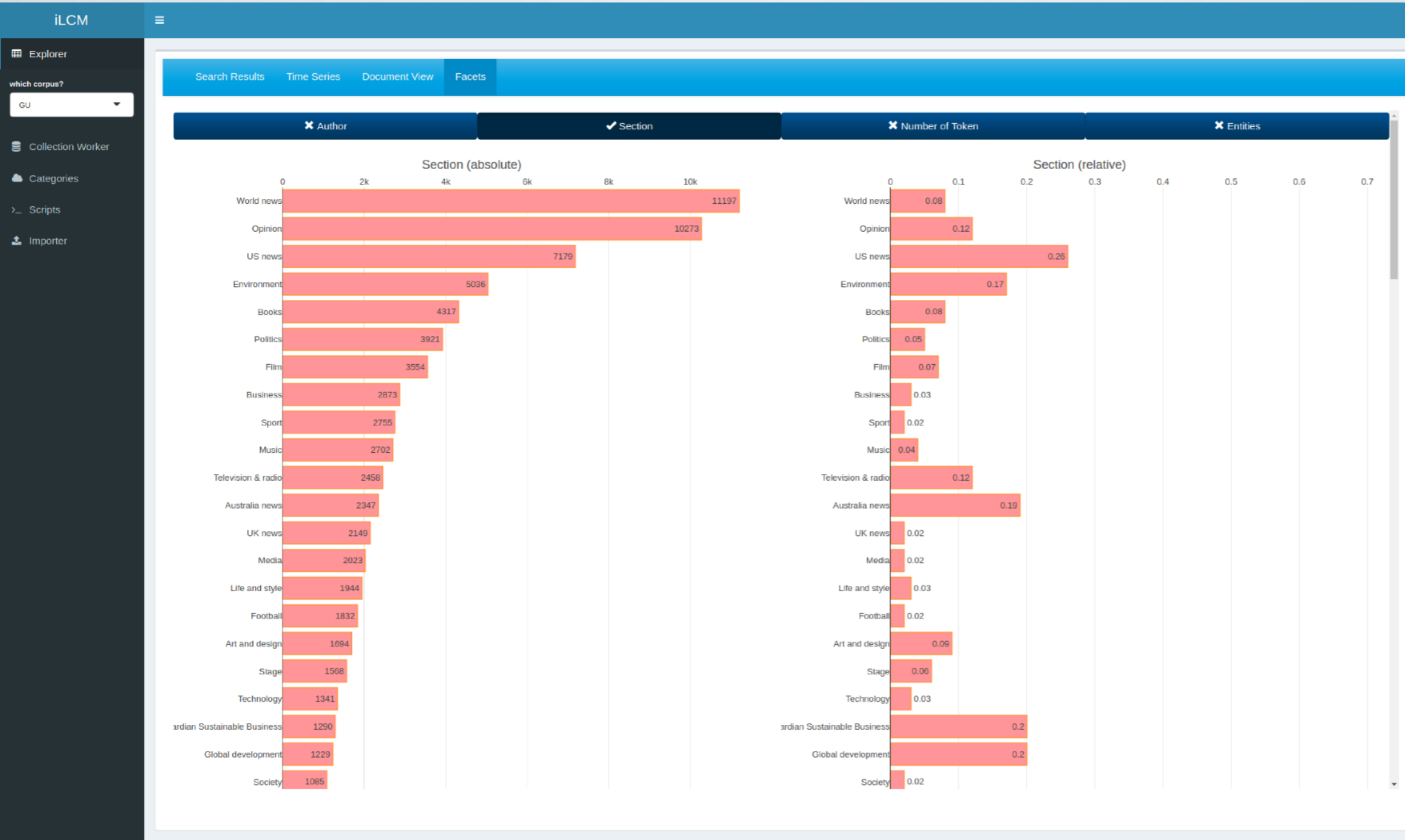
Fluss

UNSET ANNOTATION

=Document-wide annotation

Save Annotations

ILCM



Simple | Detailed | Custom

Keyword
trump#war#(climate+change)

Use raw text

Date von:
2013-01-01

Date bis:
2017-12-31

Publisher:
all

Type:
all

Section:
all

Number of Token:
100 / 52,928

Search

KONTEXTVOLATILITÄT

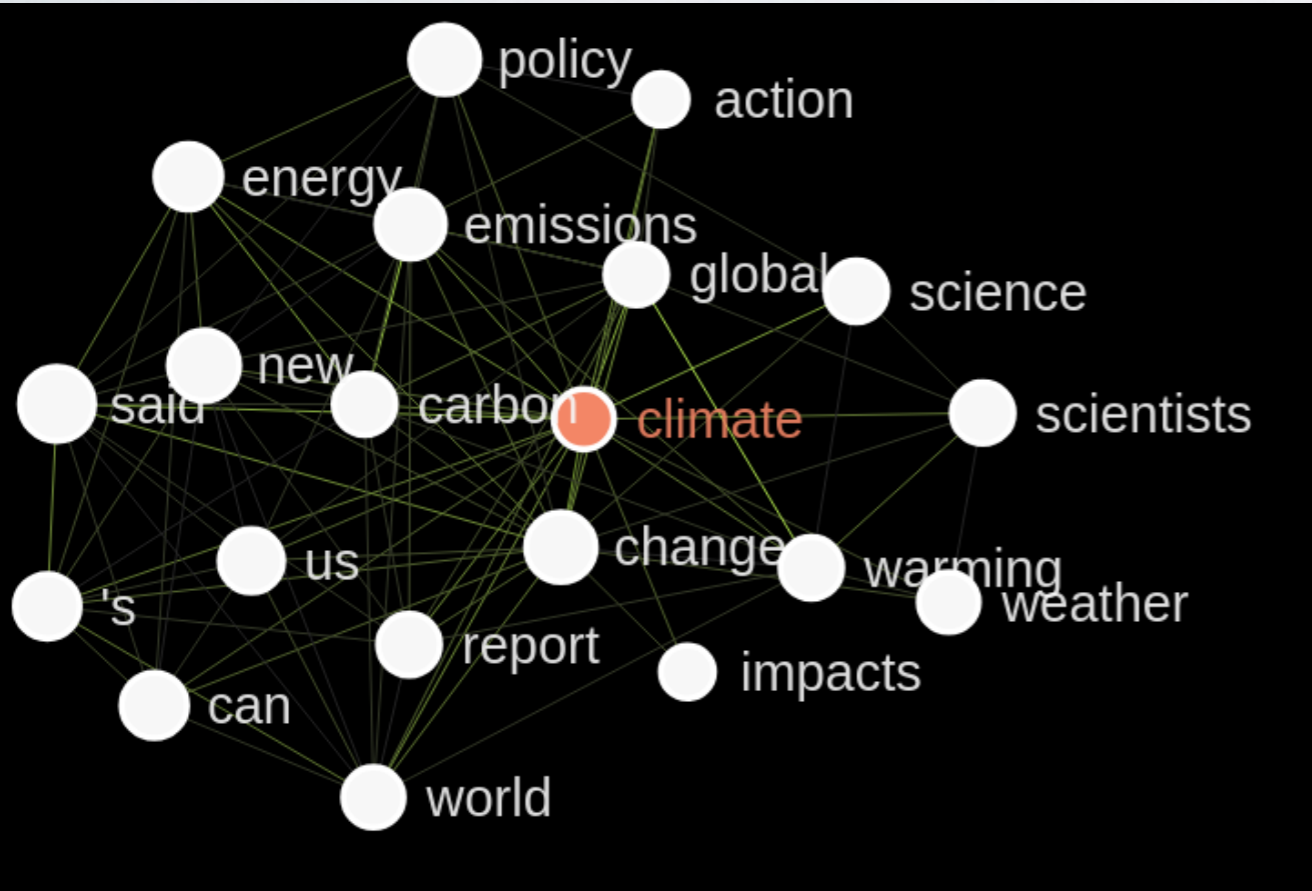
- Quantitative Messung über die Veränderung des Kontextes eines Zielwortes in einem definierten Zeitraum
- hohes Maß an Kontextveränderung kann auf eine kontroverse Diskussion hinweisen, oder ein Indikator für die semantische Veränderung eines Wortes sein

KONTEXTVOLATILITÄT

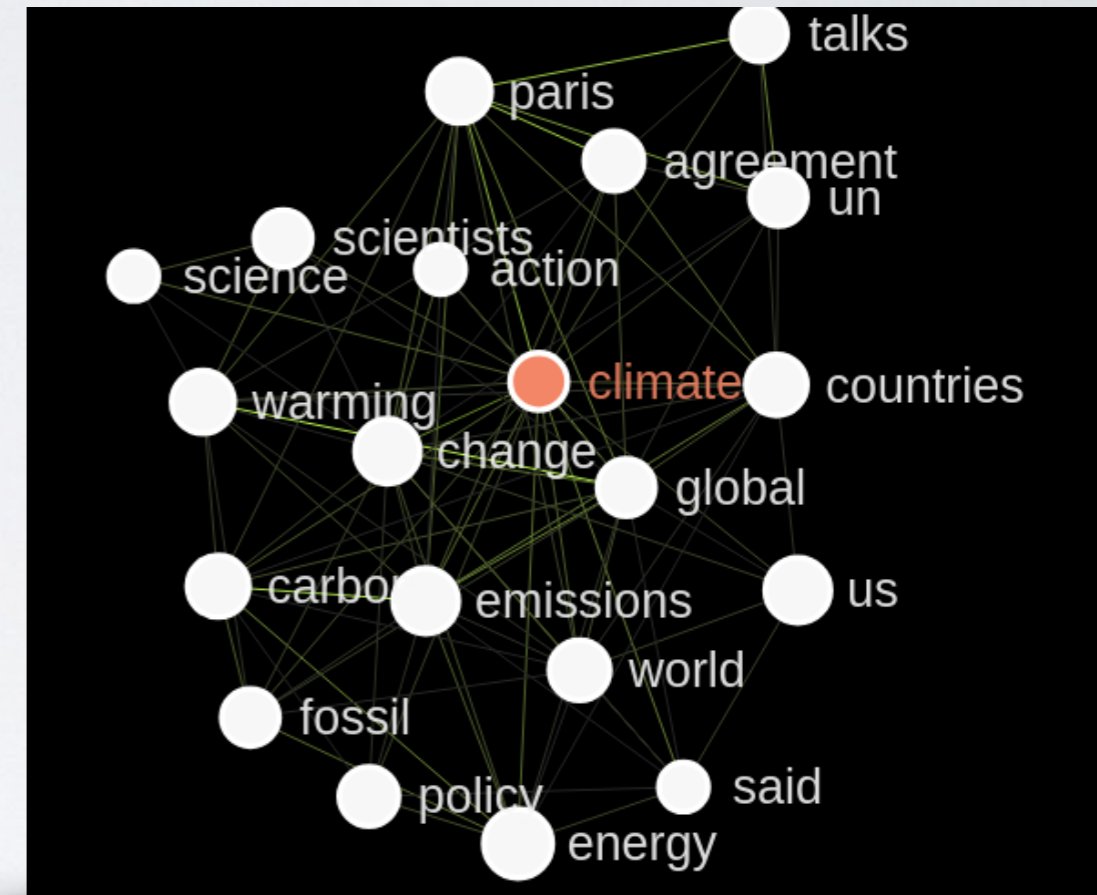
- Berechnung:
 - für jedes Zielwort wird anhand einer vorgegebenen Menge an Zeitpunkten für jede Kookkurrenz ein Erwartungswert zur Signifikanz des gemeinsamen Auftretens berechnet
 - für den Zielzeitpunkt wird für jede Kookkurrenz der aktuelle Ist-Zustand mit dem berechneten Erwartungswert verglichen
 - Kontextvolatilität: Mittelwert der Abweichungen von Ist-Zustand mit Erwartungswert aller Kookkurrenzen

KONTEXTVOLATILITÄT

Kontext for „climate“ in
2013/2014



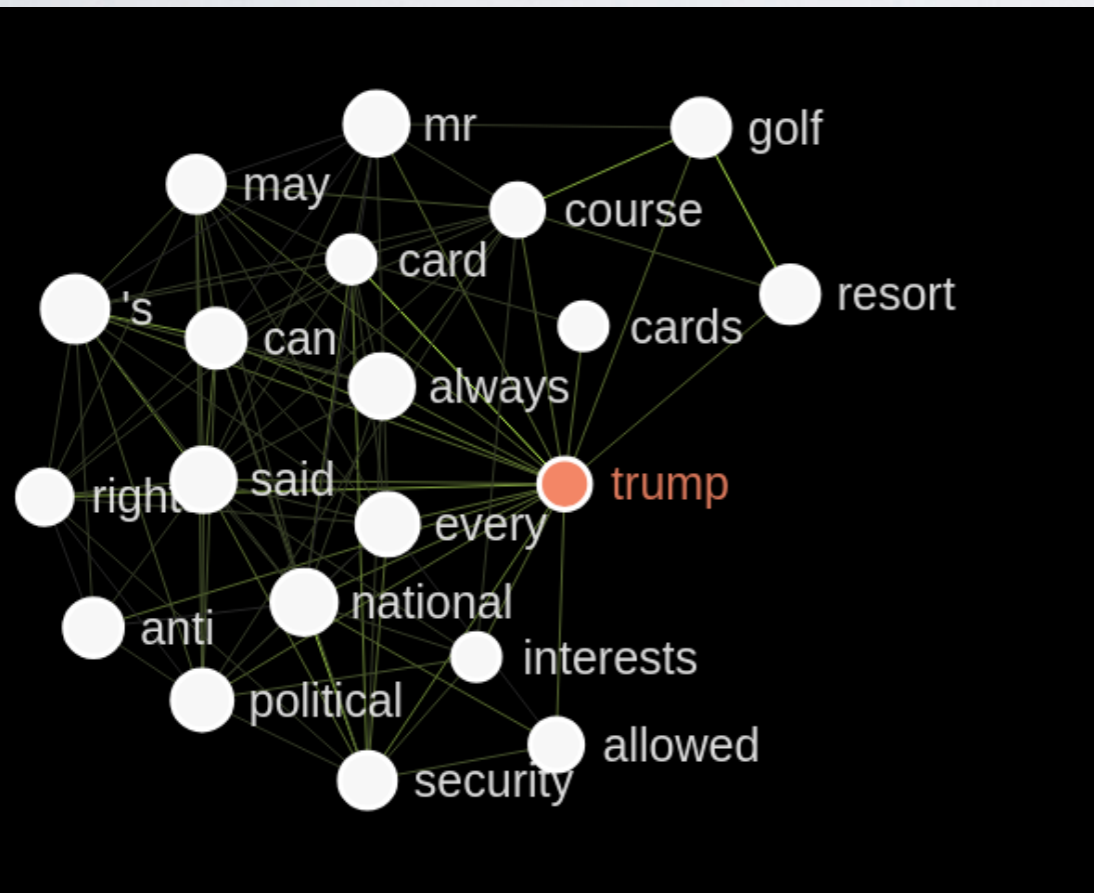
Kontext for „climate“ in
2015/2016



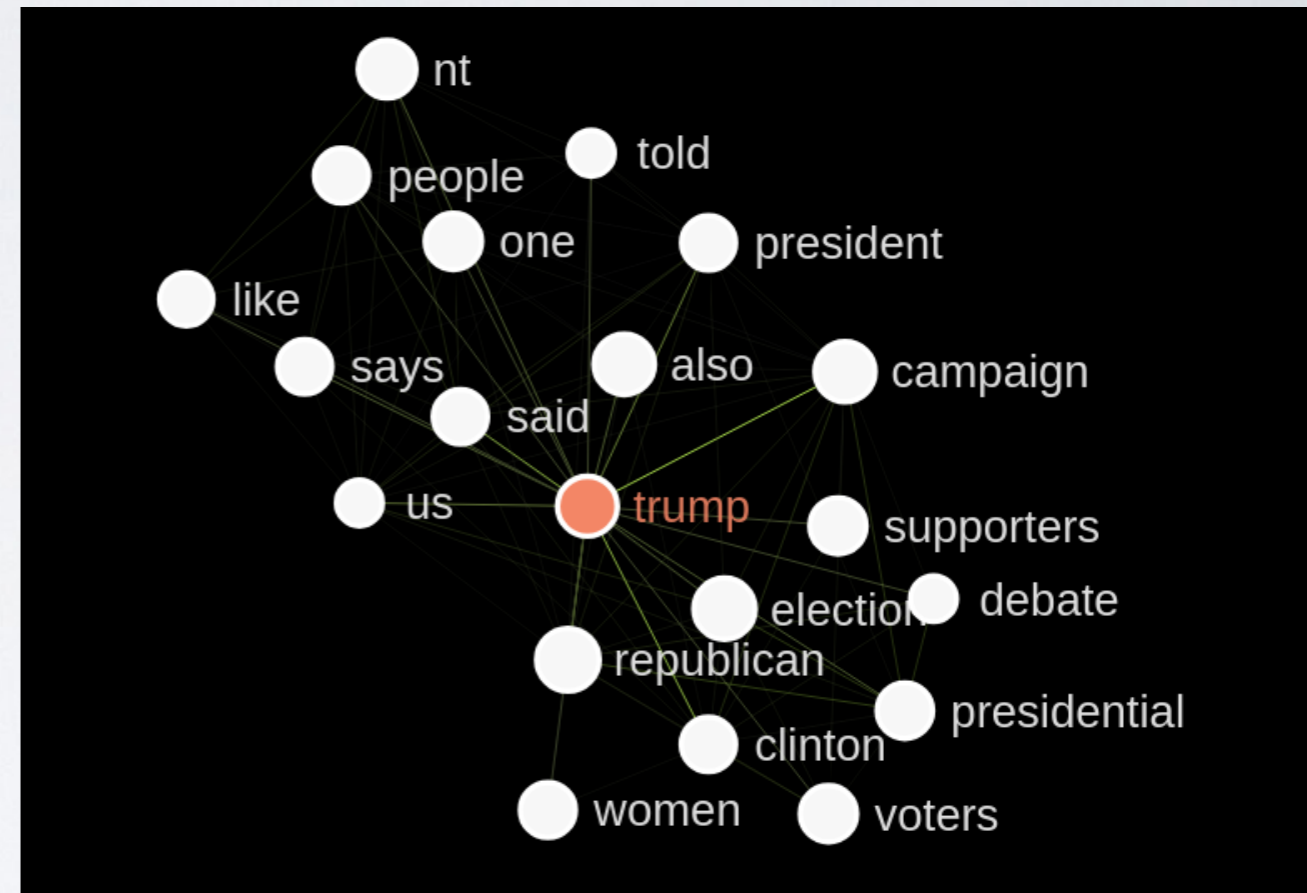
geringe Kontextvolatilität

KONTEXTVOLATILITÄT

Kontext for „trump“ in
2013/2014



Kontext for „trump“ in
2015/2016



hohe Kontextvolatilität

ANWENDUNG

- Datengrundlage: Guardian Zeitungstexte
1999-2017
- ca. 1,5 Mio. Dokumente
- Einschränkung auf Rubrik „Science“

Welche Themen gibt es?
Wann sind diese populär?

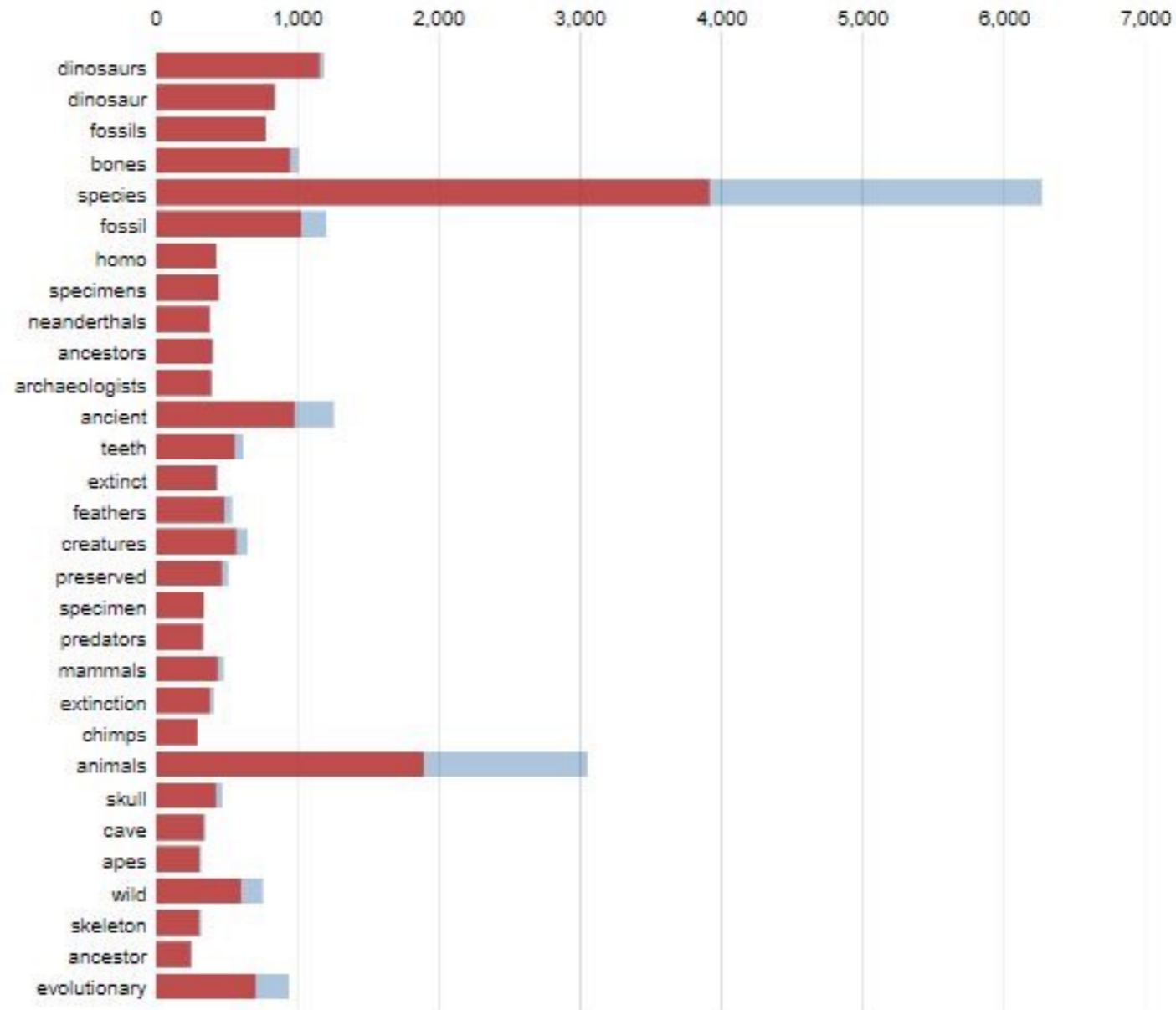
Selected Topic: Previous Topic Next Topic Clear Topic

Slide to adjust relevance metric:⁽²⁾
 $\lambda = 0.2$

Intertopic Distance Map (via multidimensional scaling)



Top-30 Most Relevant Terms for Topic 4 (10.4% of tokens)



1. saliency(term w) = frequency(w) * [sum_t p(t | w) * log(p(t | w)/p(t))] for topics t; see Chuang et. al (2012)
 2. relevance(term w | topic t) = $\lambda * p(w | t) + (1 - \lambda) * p(w | t)/p(w)$; see Sievert & Shirley (2014)

Selected Topic: 7

Previous Topic

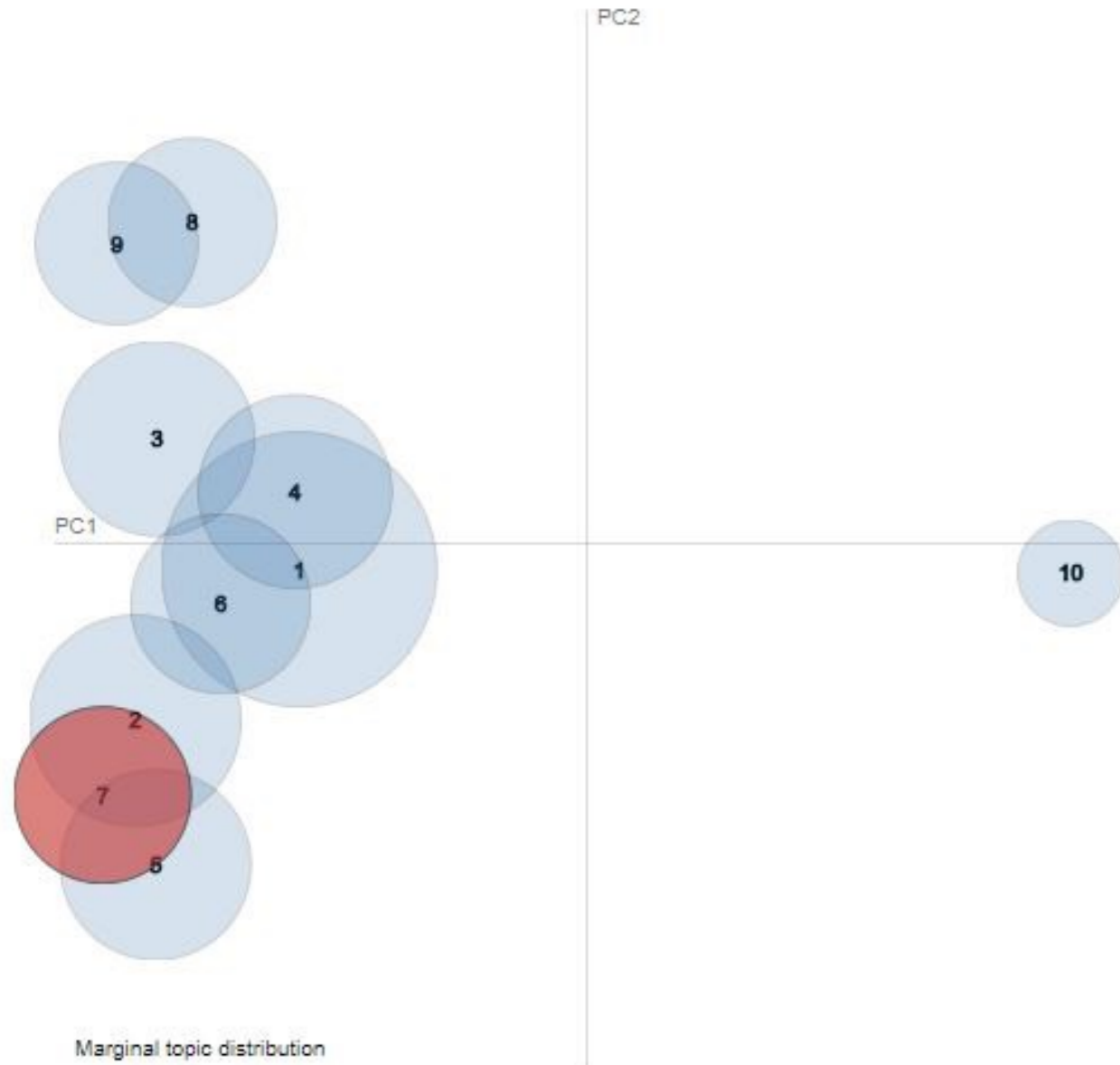
Next Topic

Clear Topic

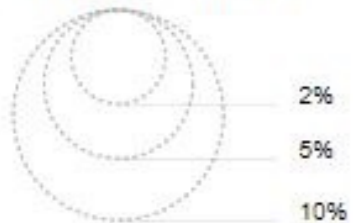
Slide to adjust relevance metric:⁽²⁾ $\lambda = 0.2$

0.0 0.2 0.4 0.6 0.8 1.0

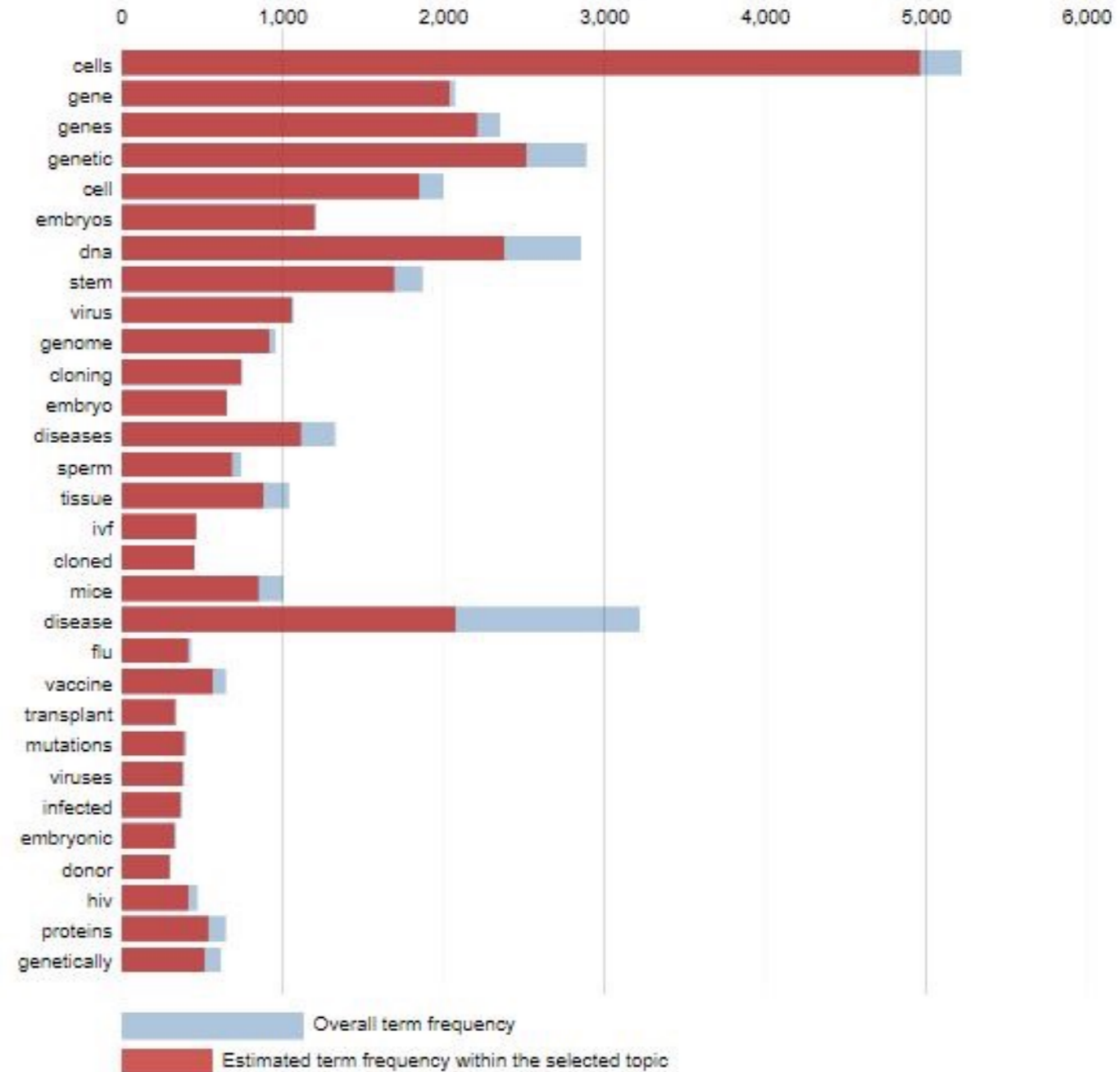
Intertopic Distance Map (via multidimensional scaling)



Marginal topic distribution



Top-30 Most Relevant Terms for Topic 7 (8.6% of tokens)



1. saliency(term w) = frequency(w) * [sum_t p(t | w) * log(p(t | w)/p(t))] for topics t; see Chuang et. al (2012)
 2. relevance(term w | topic t) = $\lambda * p(w | t) + (1 - \lambda) * p(w | t)/p(w)$; see Sievert & Shirley (2014)

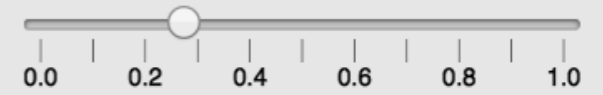
Selected Topic: 5

Previous Topic

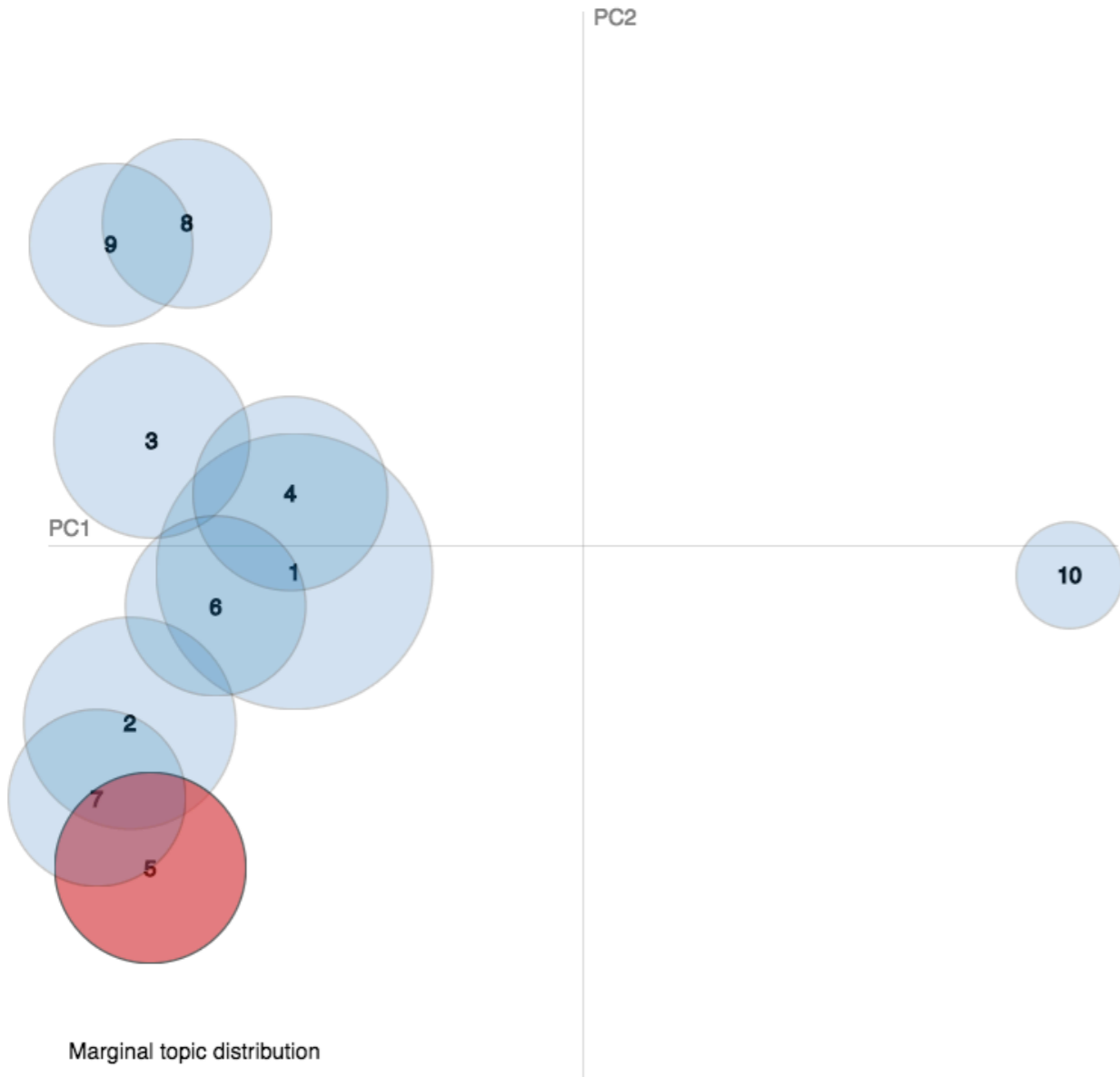
Next Topic

Clear Topic

Slide to adjust relevance metric:⁽²⁾
 $\lambda = 0.27$



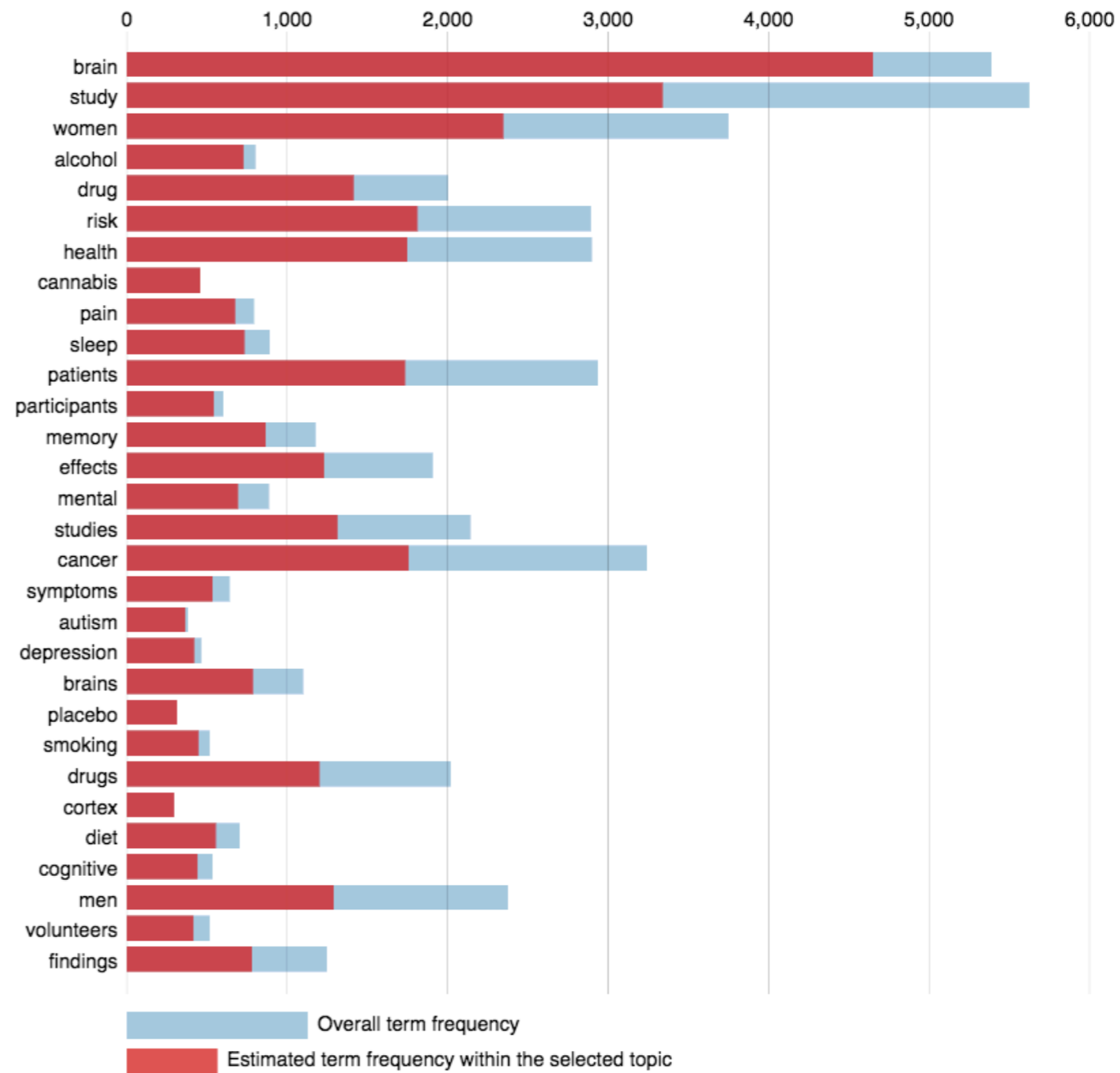
Intertopic Distance Map (via multidimensional scaling)



Marginal topic distribution



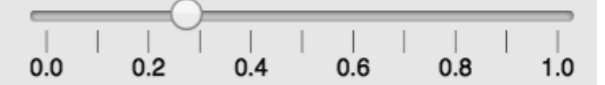
Top-30 Most Relevant Terms for Topic 5 (10% of tokens)



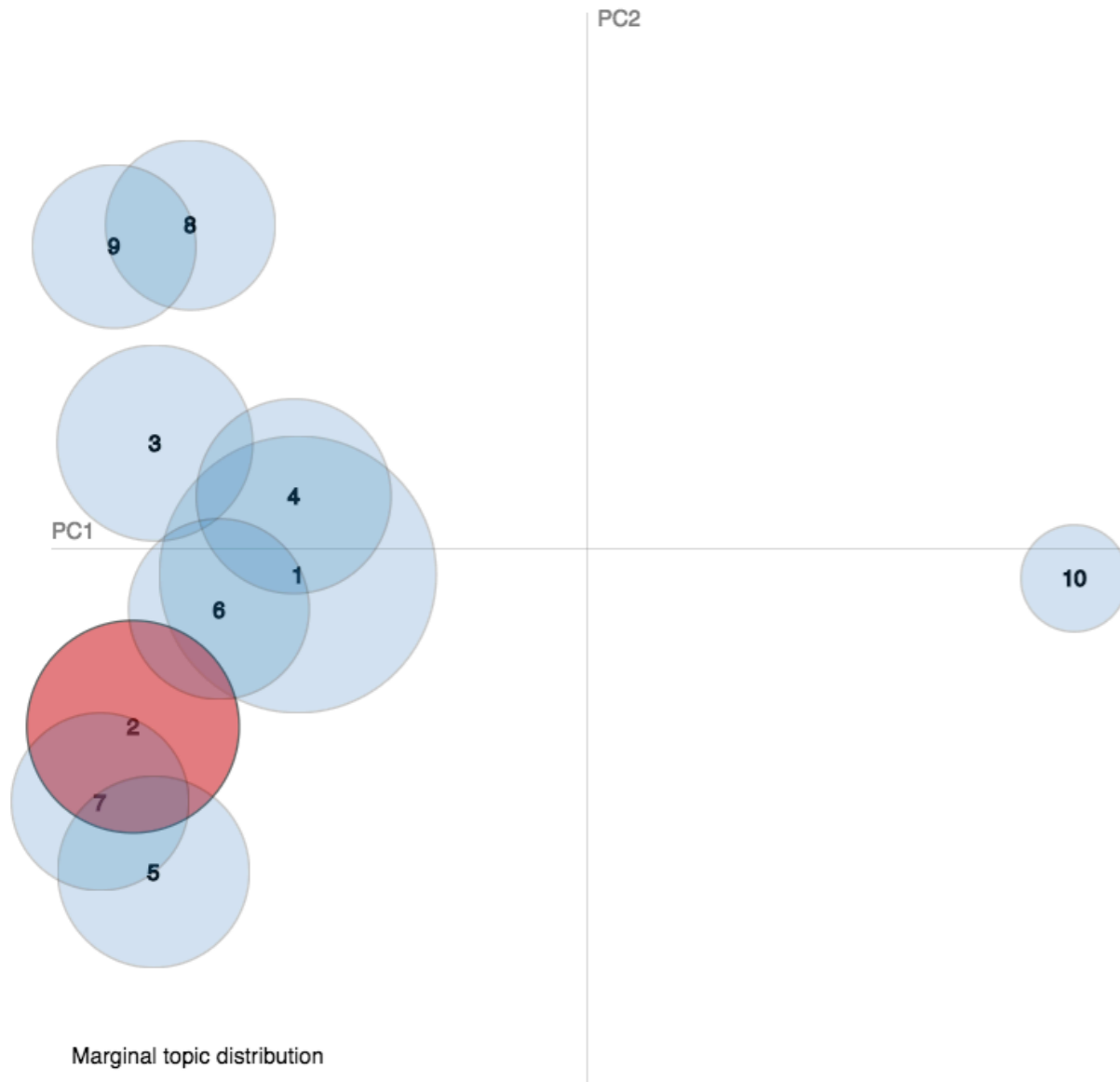
1. saliency(term w) = frequency(w) * [sum_t p(t | w) * log(p(t | w)/p(t))] for topics t; see Chuang et. al (2012)
 2. relevance(term w | topic t) = $\lambda * p(w | t) + (1 - \lambda) * p(w | t)/p(w)$; see Sievert & Shirley (2014)

Selected Topic: Previous Topic Next Topic Clear Topic

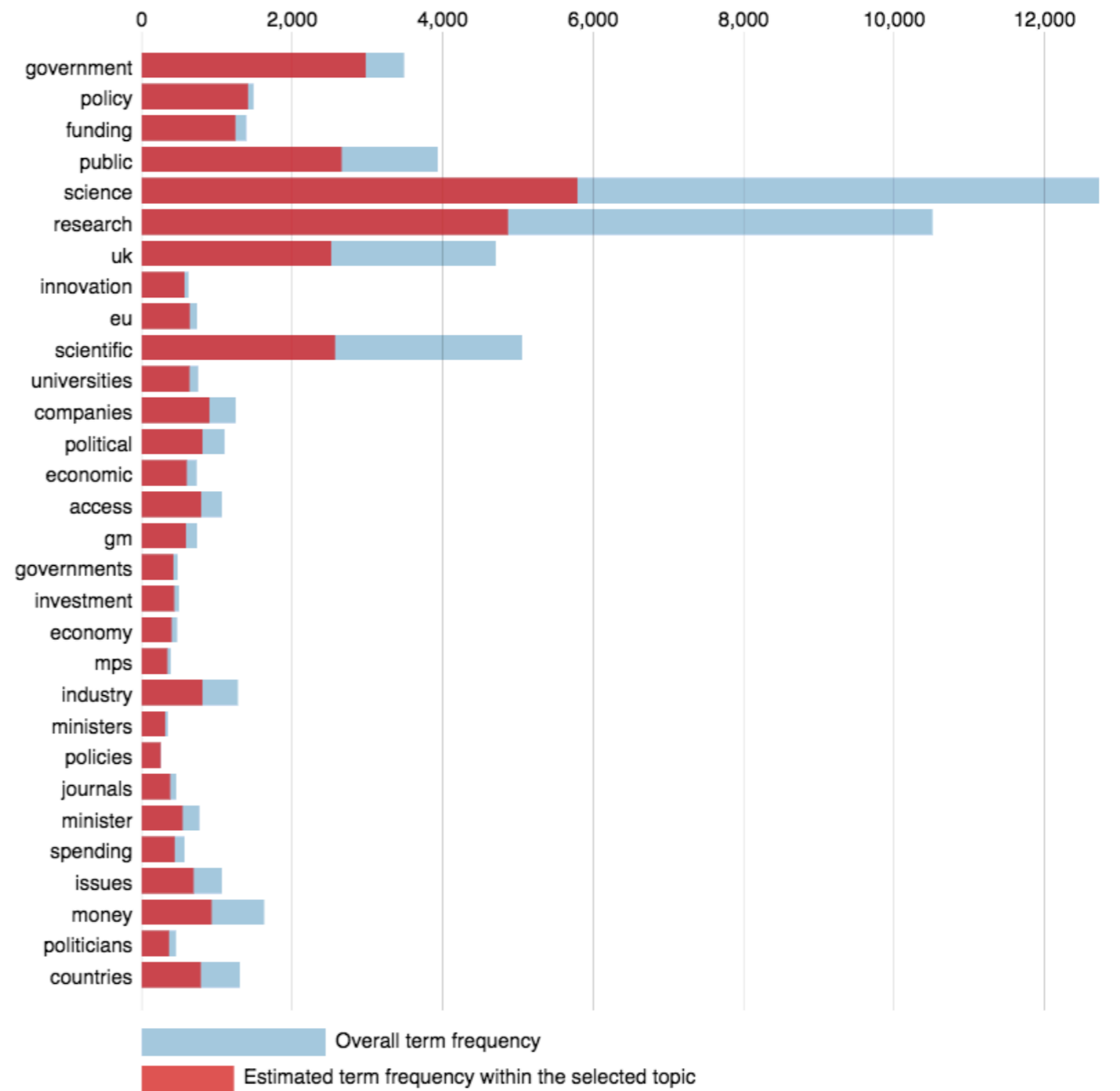
Slide to adjust relevance metric:⁽²⁾
λ = 0.27



Intertopic Distance Map (via multidimensional scaling)



Top-30 Most Relevant Terms for Topic 2 (12.3% of tokens)

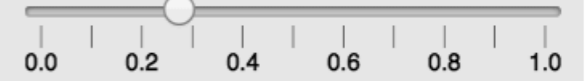


1. saliency(term w) = frequency(w) * [sum_t p(t | w) * log(p(t | w)/p(t))] for topics t; see Chuang et. al (2012)
2. relevance(term w | topic t) = λ * p(w | t) + (1 - λ) * p(w | t)/p(w); see Sievert & Shirley (2014)

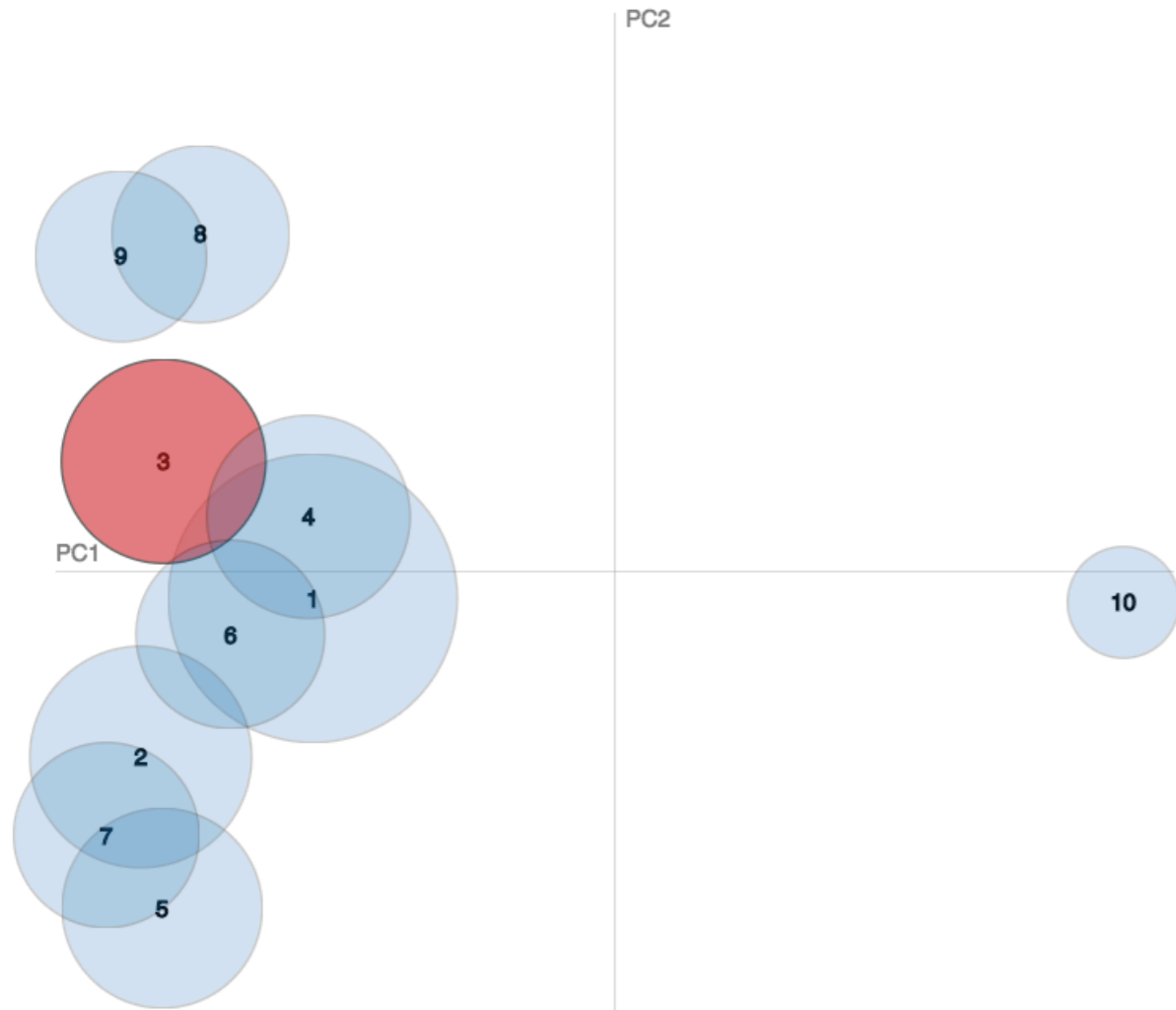
Selected Topic: Previous Topic Next Topic Clear Topic

Slide to adjust relevance metric:⁽²⁾

$\lambda = 0.27$



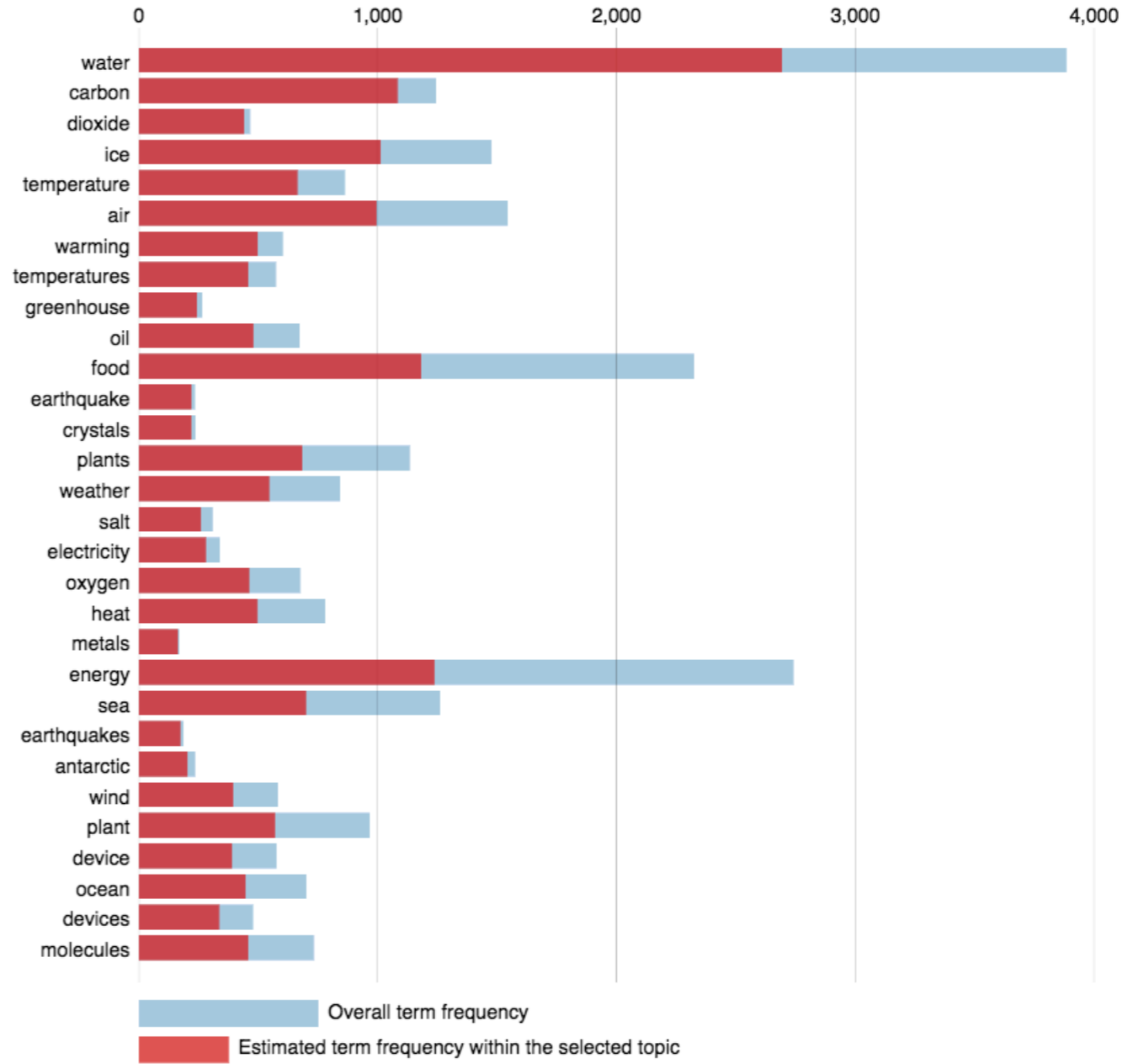
Intertopic Distance Map (via multidimensional scaling)



Marginal topic distribution



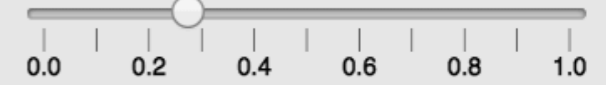
Top-30 Most Relevant Terms for Topic 3 (10.5% of tokens)



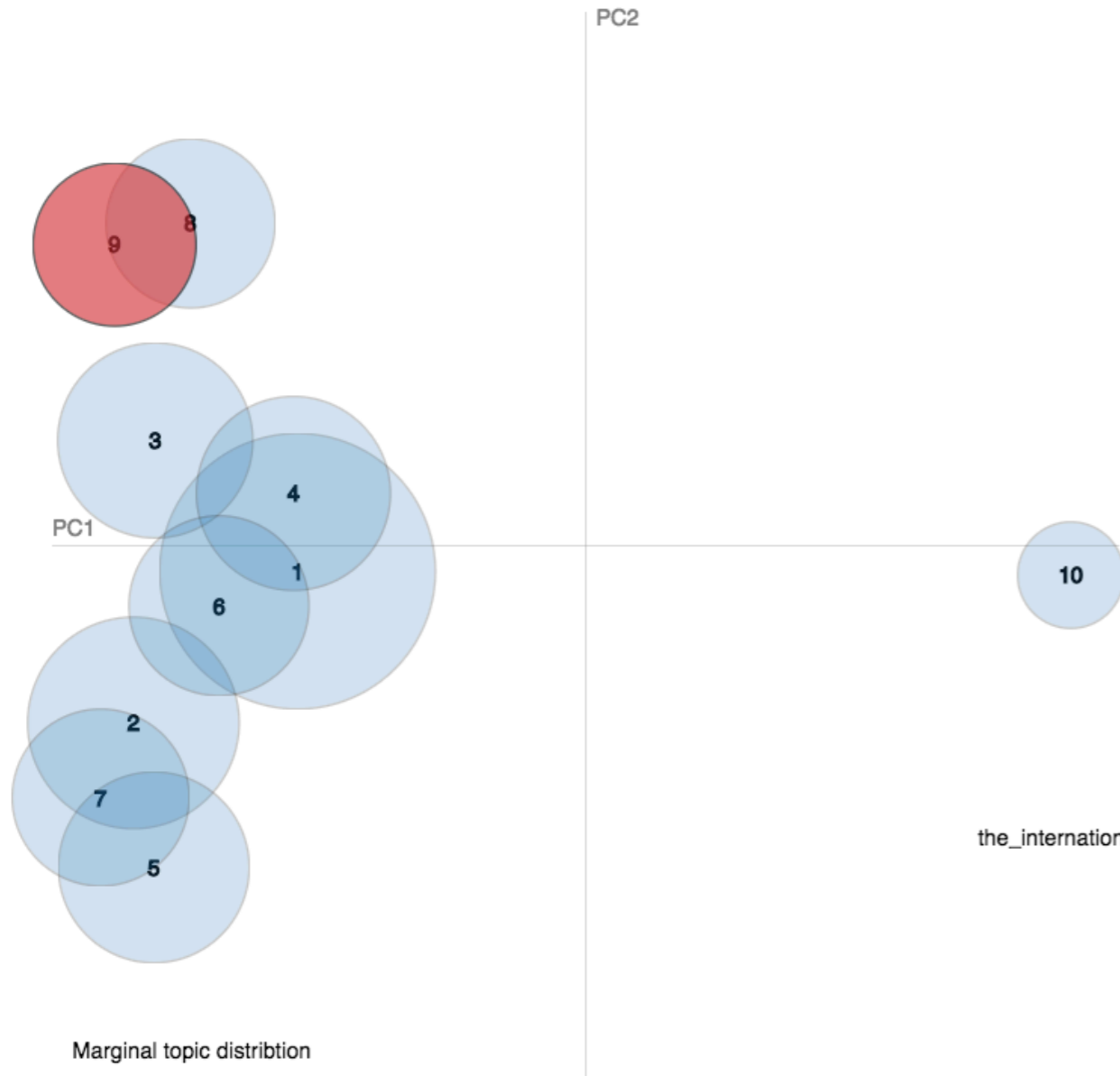
1. saliency(term w) = frequency(w) * [sum_t p(t | w) * log(p(t | w)/p(t))] for topics t; see Chuang et. al (2012)
 2. relevance(term w | topic t) = $\lambda * p(w | t) + (1 - \lambda) * p(w | t)/p(w)$; see Sievert & Shirley (2014)

Selected Topic: Previous Topic Next Topic Clear Topic

Slide to adjust relevance metric:⁽²⁾
λ = 0.27



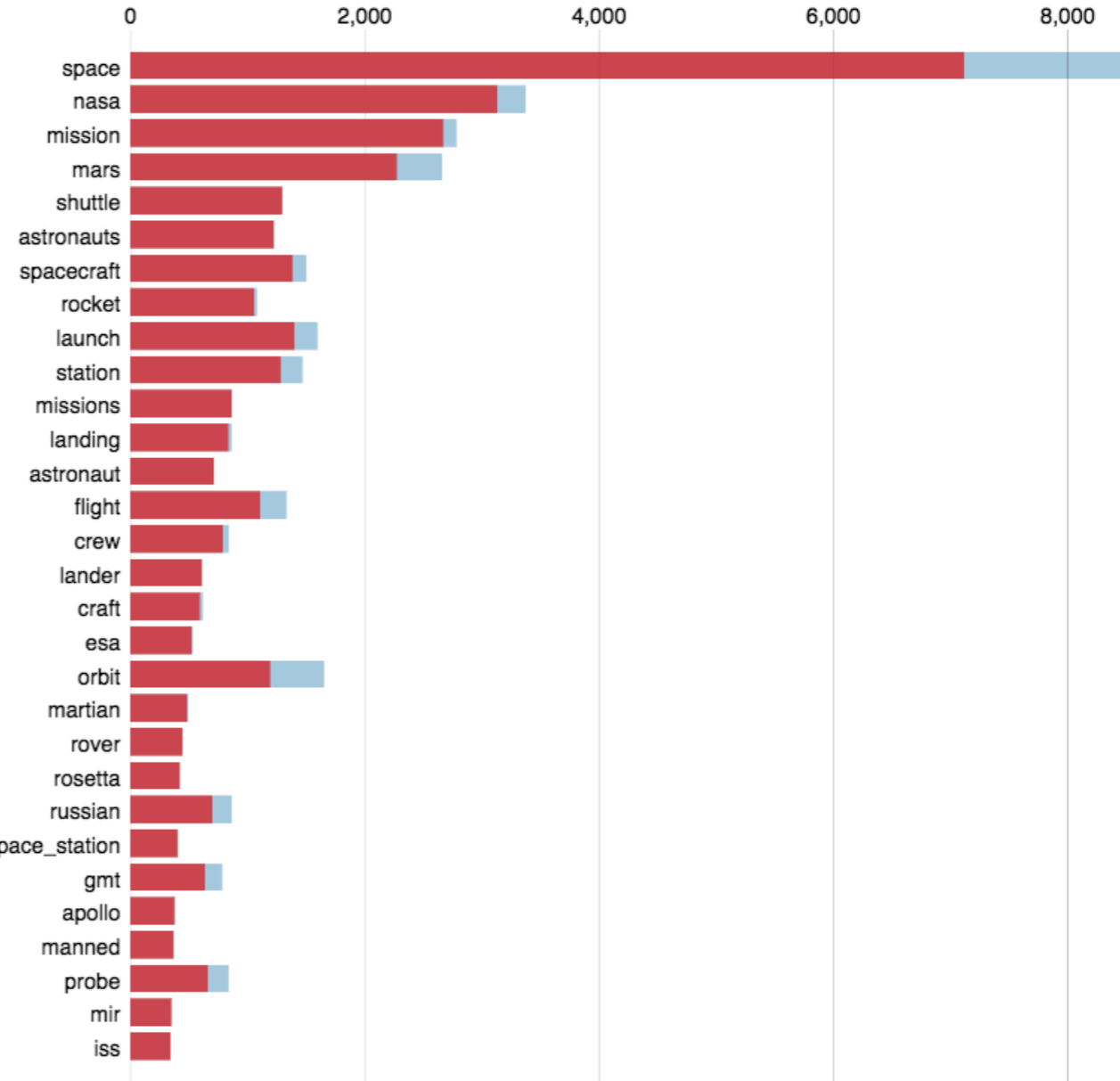
Intertopic Distance Map (via multidimensional scaling)



Marginal topic distribution



Top-30 Most Relevant Terms for Topic 9 (7.3% of tokens)



Overall term frequency
Estimated term frequency within the selected topic

1. saliency(term w) = frequency(w) * [sum_t p(t | w) * log(p(t | w)/p(t))] for topics t; see Chuang et. al (2012)
2. relevance(term w | topic t) = λ * p(w | t) + (1 - λ) * p(w | t)/p(w); see Sievert & Shirley (2014)

Parameters

reset chart
lay Year
Day Month Year
Document Count relative Document Count
Document Count Document Probability Document Count
Use Rank1 for Selecting documentbelongings

Topic: 1

+ 
Probability: 0.1854

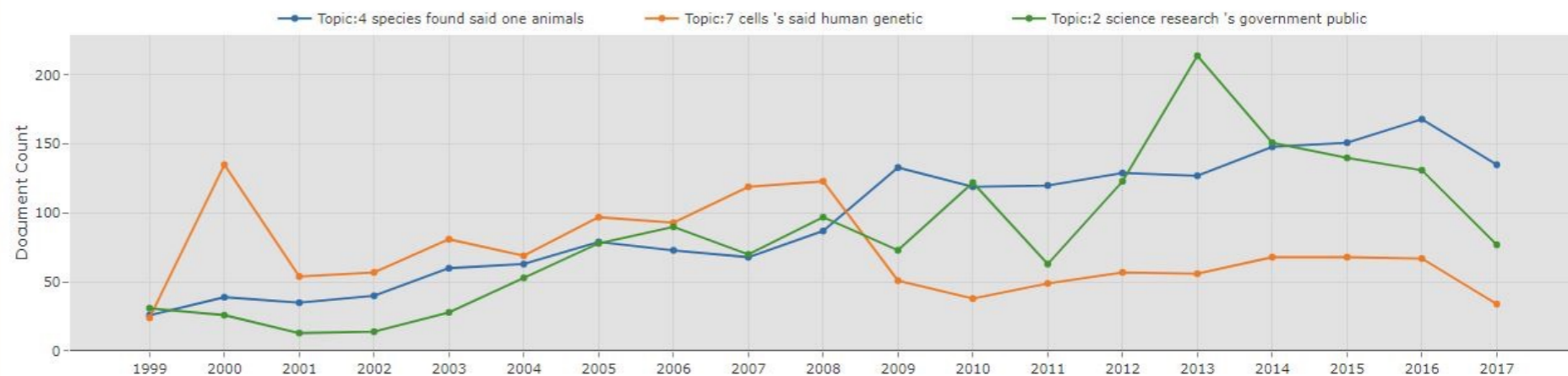


Topic: 2

+ 
Probability: 0.1007



LDA-Vis Wordclouds



Topic most coherent words

topic: 4 species found said one animals new 's like humans human also first birds long known

topic: 7 cells 's said human genetic dna scientists genes disease gene can cell new research stem

topic: 2 science research 's government public said scientists scientific uk new can us people also policy

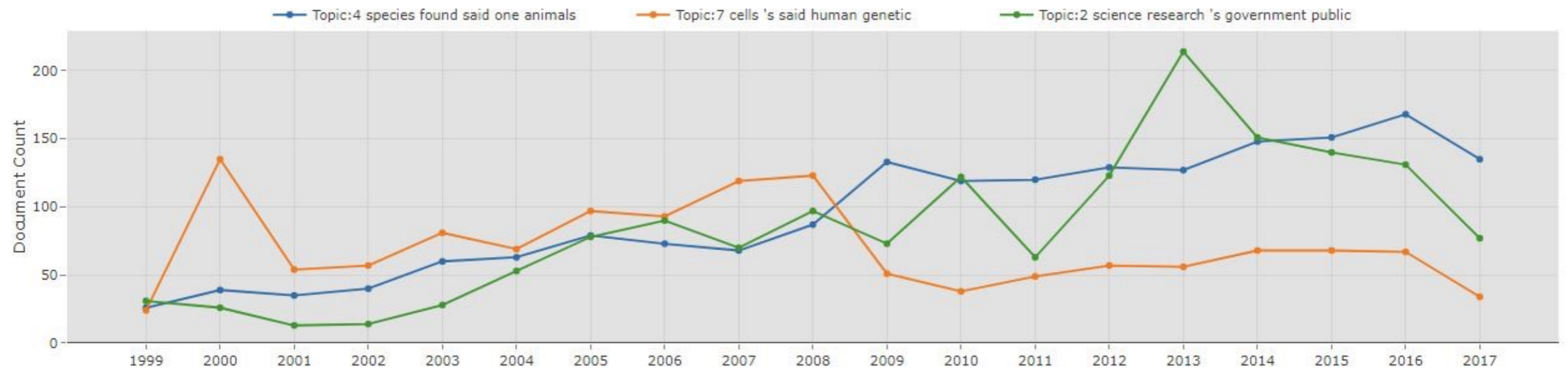
Name for Subcollection

science_

Save Subcollection

LDA-Vis

Wordclouds



Welche Terme haben eine hohe Kontextvolatilität?



- Explorer
- Collection Worker
- Categories
- Scripts
- Importer

Parameters

Update Plot

which time?

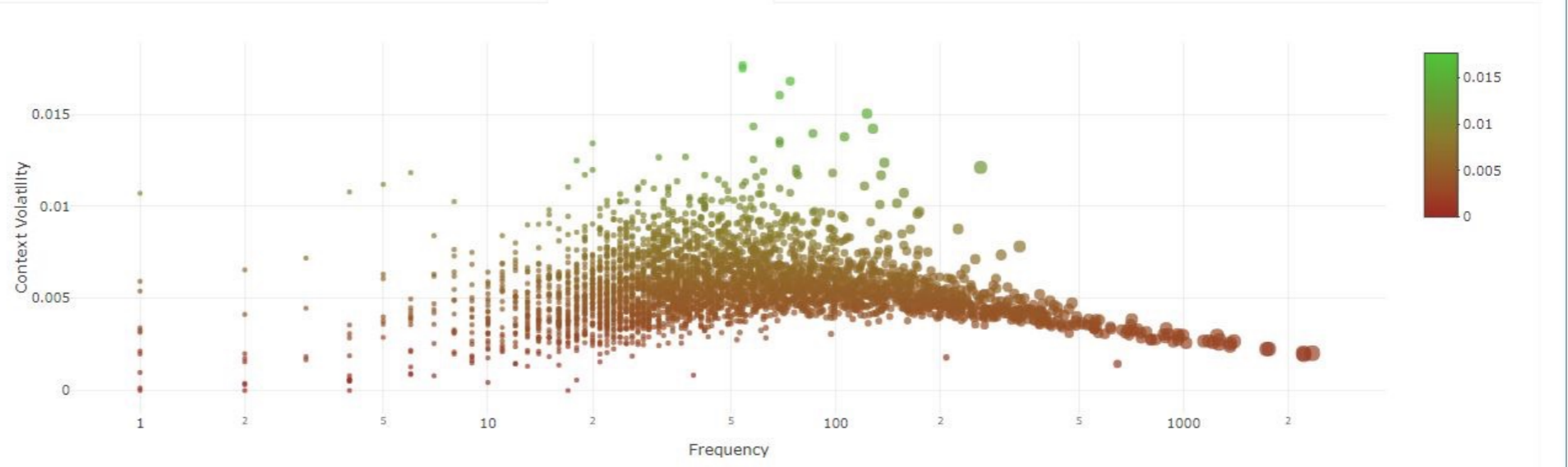
2017

specify NER Tags

all

specify POS Tags

all



- Explorer
- Collection Worker
- Categories
- Scripts
- Importer

Parameters

[Update Plot](#)

which time?
 year

specify NER Tags
 all

specify POS Tags
 all

max frequency
 1000

min frequency
 20

Number of Words per Plot

Year: 2002

Show 10 entries Search:

	words	frequency	volatility
1	clone	53	0.0226
2	dolly	68	0.0221
3	fertilisation	24	0.0197
4	bridge	60	0.0195
5	therapeutic	31	0.0169
6	fibres	25	0.0168
7	sheep	54	0.0163
8	cloned	104	0.0162
9	meteorite	40	0.0162
10	shares	49	0.016

Showing 1 to 10 of 1,009 entries

Previous 1 2 3 4 5 ... 101 Next

Year: 2003

Show 10 entries Search:

	words	frequency	volatility
1	dolly	34	0.0179
2	fertilisation	35	0.0176
3	aids	56	0.0161

Year: 2017

A word cloud for the year 2017, featuring various terms in different colors and orientations. The words are: landed, moons, editing, spacex, violence, nasas, alamy, rings, cassini, mag, puzzles, cretaaceous, column, mitochondrial, and alzheimers. The words are arranged in a roughly triangular shape, with 'landed' at the top and 'mitochondrial' at the bottom left.

Year: 2017

A word cloud for the year 2017. The words are arranged in a roughly circular pattern and vary in size and color. The word 'spacex' is the largest and is highlighted with a yellow hand-drawn box. Other prominent words include 'landed', 'moons', 'editing', 'violence', 'nasas', 'alamy', 'rings', 'cassini', 'mag', 'puzzles', 'cretaceous', 'column', 'mitochondrial', and 'alzheimers'. The colors range from dark purple to green.

landed
moons editing
spacex
violence nasas alamy rings
cassini mag puzzles
cretaceous
column
mitochondrial alzheimers

Single Word

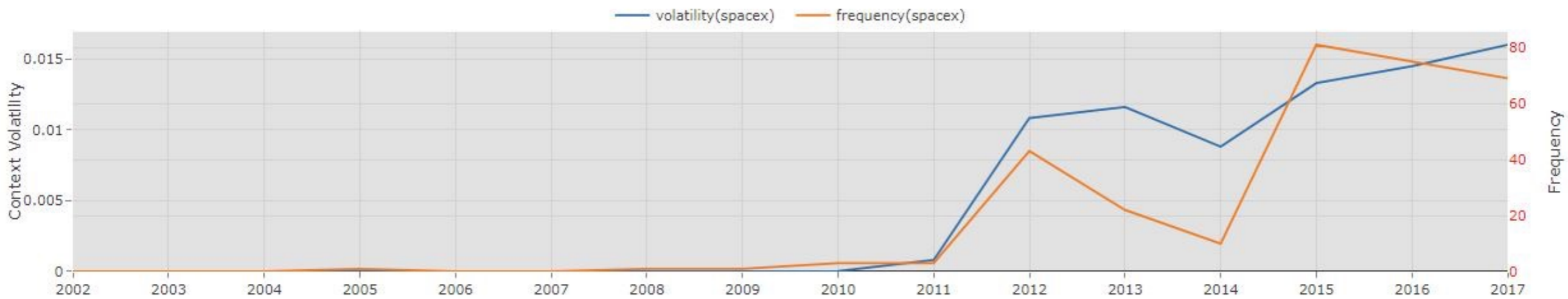
Multi Words

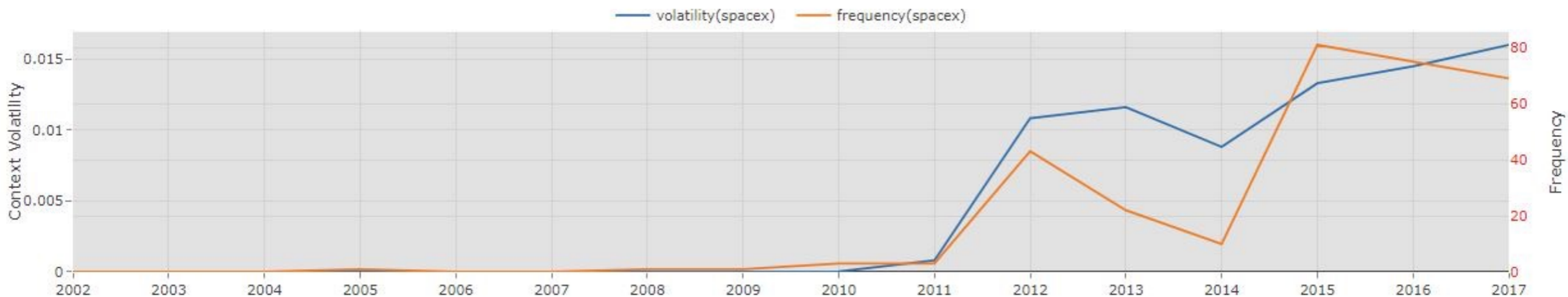
Highest Volatility

Lowest Volatility

Highest Volatility periodwise

Wordclouds for Highest Volat





top co-occurrences



Single Word

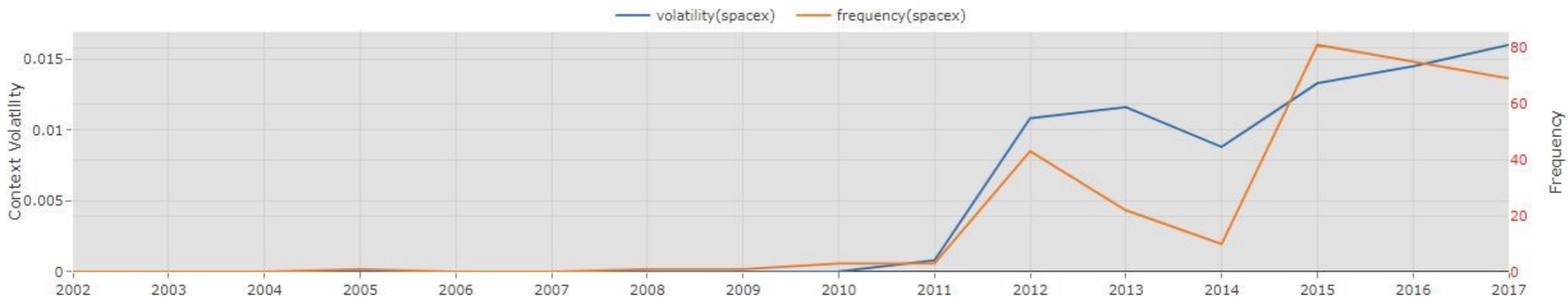
Multi Words

Highest Volatility

Lowest Volatility

Highest Volatility periodwise

Wordclouds for Highest Volat



top co-occurrences





Explorer

which corpus?

GU

Collection Worker

Categories

Scripts

Importer

Search Results | Time Series | Document View | Facets

362 Documents were found!

id	score	section	title	author	date	token	keyword.and.context	keep
1357700	17.367487	Science	Nasa SpaceX mission to International Space Station ends in explosion	0	2015-06-28	877	launch of a SpaceX supply mission to the International Space Station (ISS) ended in an explosion that	<input checked="" type="checkbox"/>
1344489	17.44553	Science	Unmanned SpaceX flight aims to show it has learned shuttle disaster lessons	0	2015-05-05	900	presidential candidates suggests constitutional reform may no longer be the refuge of political kooks. SpaceX	<input checked="" type="checkbox"/>
1479581	17.479893	Technology	Elon Musk wants to cover the world with internet from space	0	2016-11-17	413	in order to blanket the Earth with internet access. SpaceX, the privateer space company led by Musk	<input checked="" type="checkbox"/>
1489911	17.491764	Science	SpaceX successfully launches Falcon 9 rocket months after explosion	0	2017-01-15	482	SpaceX successfully launches Falcon 9 rocket months after explosion. Gig organised by Planned	<input checked="" type="checkbox"/>
1508164	17.498999	Science	SpaceX becomes first to re-fly used rocket	0	2017-03-30	819	and Jackie Chan. SpaceX launched its first pre-flown rocket on Thursday, marking the first time anyone	<input checked="" type="checkbox"/>
1394505	17.531256	Science	Nasa signs first contracts with SpaceX for manned commercial spaceflight	0	2015-11-20	427	first mission orders with California-based private spaceflight company SpaceX to transport astronauts to	<input checked="" type="checkbox"/>
1432934	17.601074	Science	Elon Musk planning SpaceX mission to Mars by 2018	0	2016-04-27	317	Elon Musk planning SpaceX mission to Mars by 2018. Tesla boss SpaceX plans to send an unmanned	<input checked="" type="checkbox"/>
1434980	17.61261	Science	Elon Musk's SpaceX lands reusable rocket on barge for second time	0	2016-05-06	767	estrangement from Nicki Minaj the worlds most meme-worthy rapper returns. SpaceX landed a rocket on a robotic	<input checked="" type="checkbox"/>
1055757	17.722359	Science	SpaceX Dragon docking with the space station – in pictures	0	2012-05-25	449	have clinched the title before the astonishing finish at the Etihad Stadium. The SpaceX Dragon	<input checked="" type="checkbox"/>
1403364	17.778984	Technology	Size matters: Bitter Bezos takes swipe at Musk over SpaceX rocket landing	0	2015-12-22	459	landing the 48m SpaceX Falcon 9 rocket after delivering satellites into orbit was too good a moment to	<input checked="" type="checkbox"/>

Page: 1 5 9 13 17 21 25 29 33 37

Simple | Detailed | Custom

Simple search. Terms may be combined with + # -
 + = AND
 # = OR
 - = NOT

Keyword

spacex

Use raw text

Search

Save Collection

Collection Name:

spacex

Save Collection



Explorer

which corpus?
GU

Collection Worker

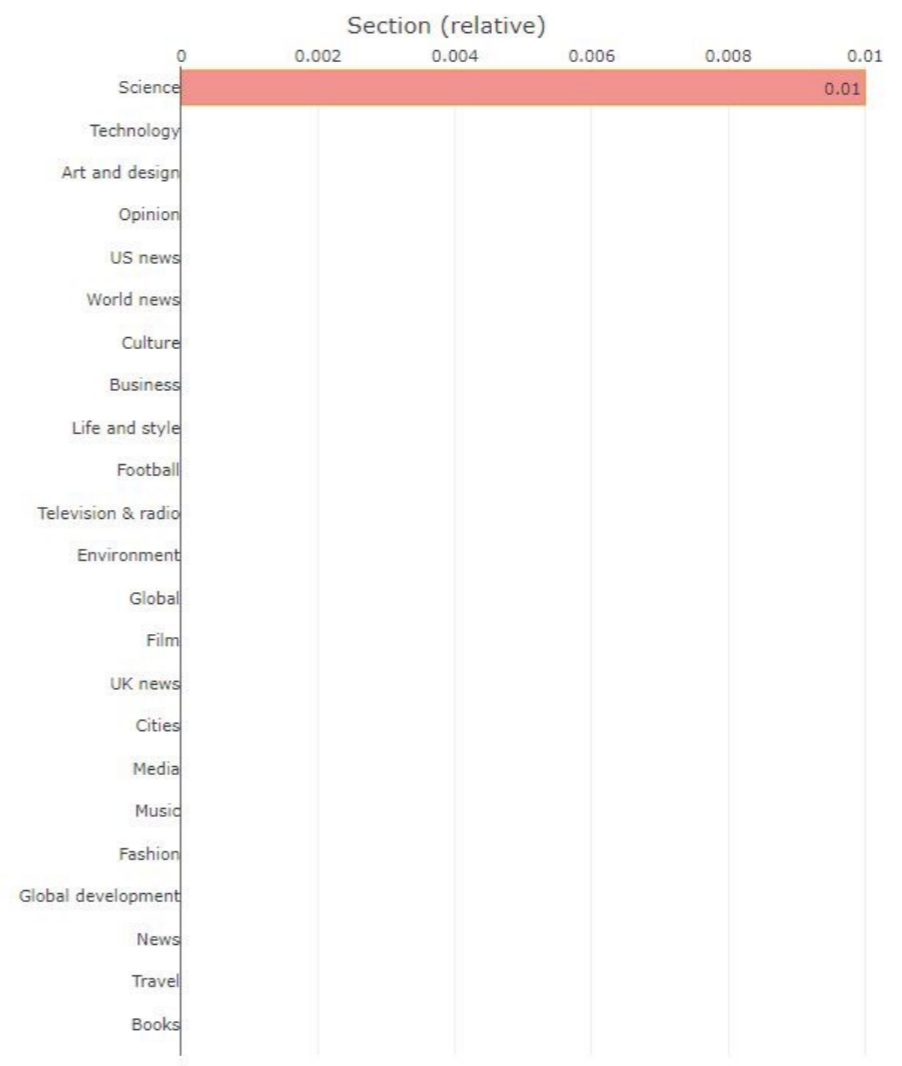
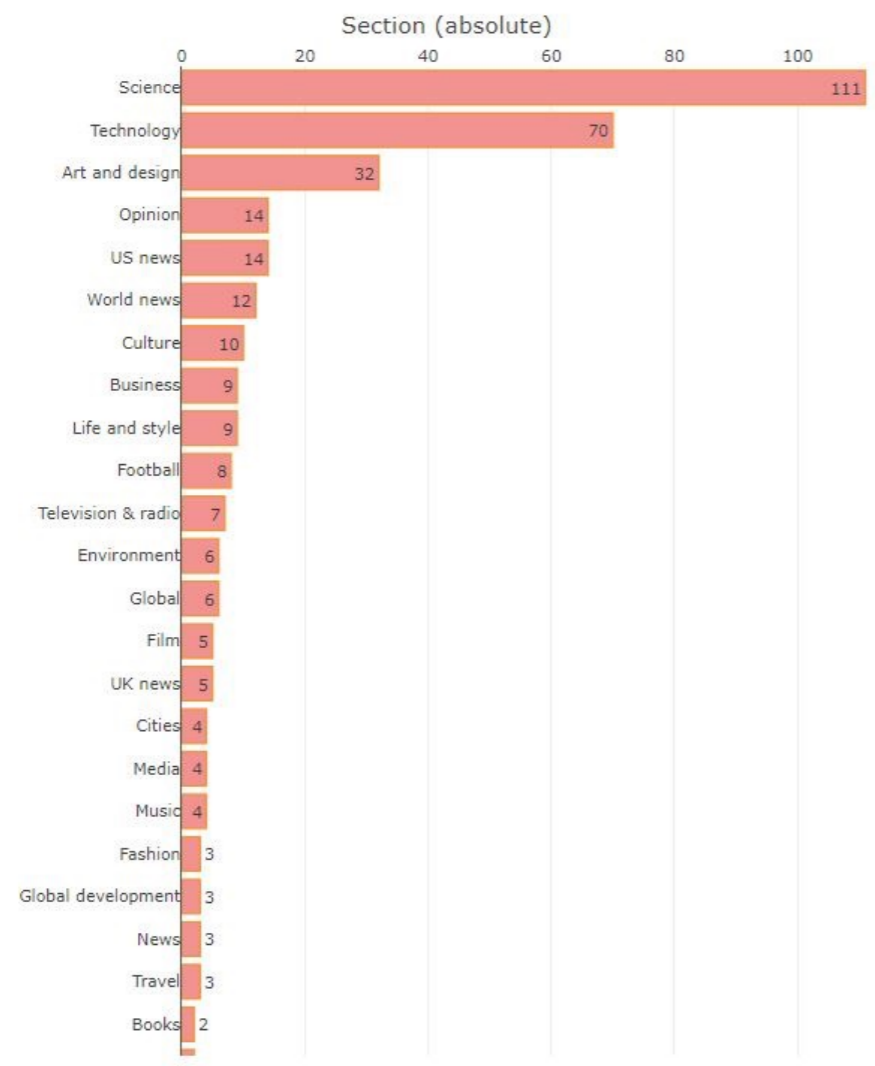
Categories

Scripts

Importer

Search Results | Time Series | Document View | **Facets**

✕ Author | **✓ Section** | ✕ Number of Token | ✕ Entities



Simple | Detailed | Custom

Simple search. Terms may be combined with + # -
+ = AND
= OR
- = NOT

Keyword

Use raw text

Search



- Explorer
- Collection Worker
- Categories
- Scripts
- Importer

Parameters

Update Plot

Words:

spacex

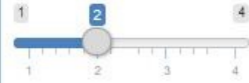
Root max Links:



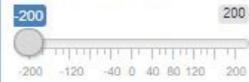
Leaves max Links:



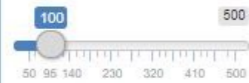
Depth of Graph



Charge of Graph

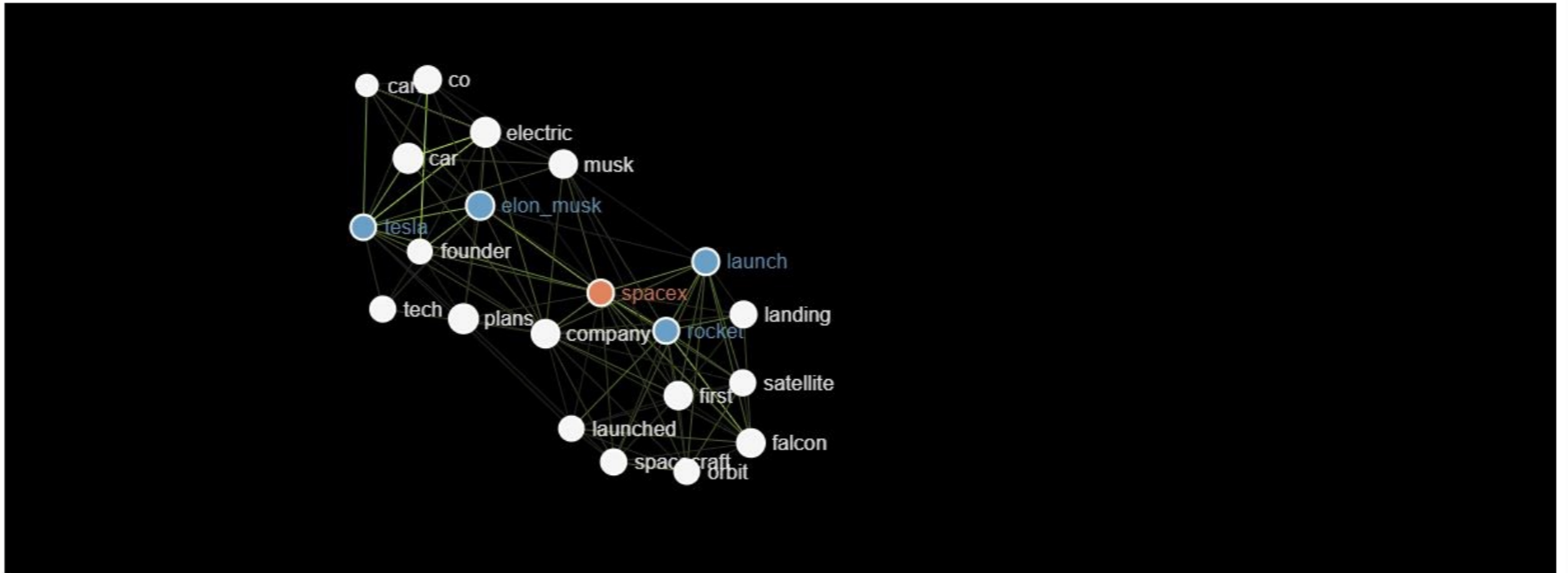


Maximum Number of Edges

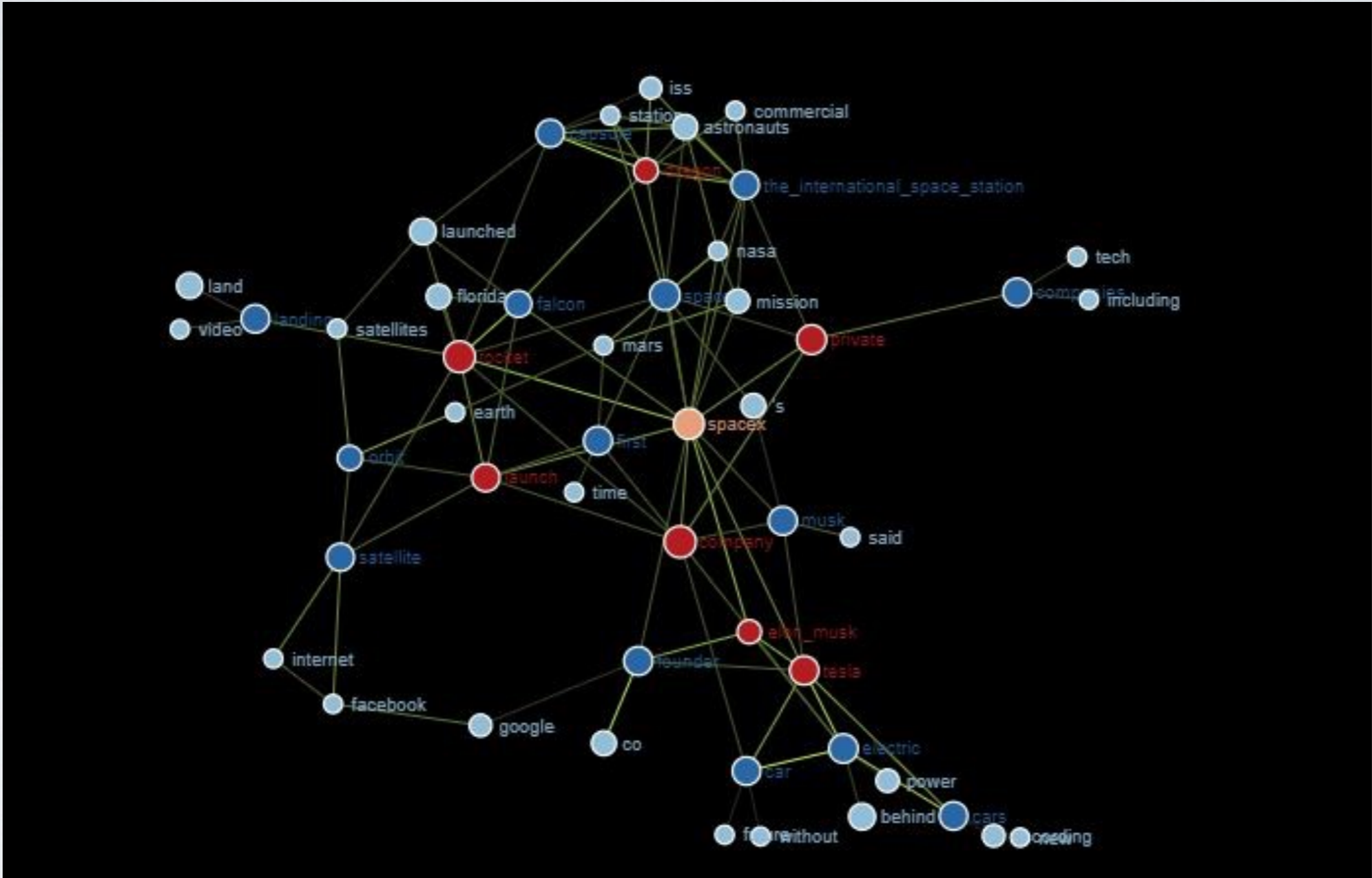


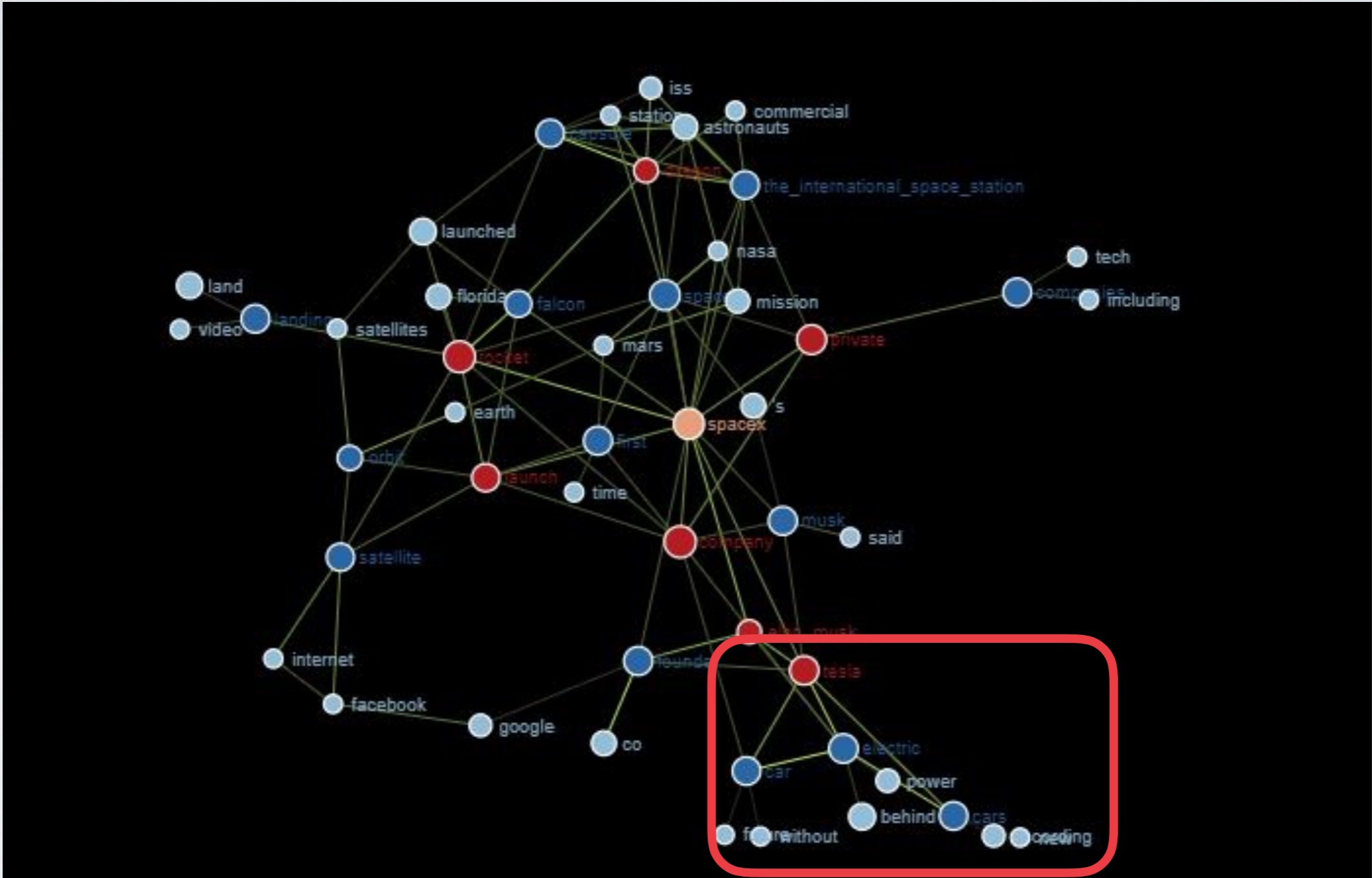
Co-occurrence Graph

Co-occurrence Matrix



before	target	after
payment system PayPal , has a firm called	spacex	which aims to launch a military satellite this_year
documenting his death - defying performances . JL	spacex	, to Dec_2 Shell Wildlife_Photographer Of The YearLondon
his genius as a design engineer . His	spacex	company builds wholly re - usable spacecraft (
of quiet contemplation and hallucinatory images . JL	spacex	, Sat_25 to Sep_22 William_Blake_Edinburgh Has there ever
is the natural order of things . JL	spacex	, to Dec 1 Louise_Bourgeois London The nonagenarian
a day between_December_15_and_February_23 to visit Exeter's trailblazing	spacex	gallery . Here you'll find an exhibition







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- [Mitmachen](#)
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Tesla, Inc.

Tesla, Inc. (bis 1. Februar 2017 *Tesla Motors*) ist ein **US-amerikanisches** Unternehmen, das 2003 gegründet wurde. Es nennt als Ziel: „Die Beschleunigung des Übergangs zu nachhaltiger Energie“.^[3] Dazu sollten so schnell wie möglich **Elektroautos**, **Stromspeicher** und **Photovoltaikanlagen** für ein breites Publikum gebaut werden. Der Name erinnert an den Physiker und Erfinder **Nikola Tesla**. Die Nutzungsrechte für die Marke Tesla erhielt das US-amerikanische Unternehmen nach einer Übereinkunft mit der tschechischen **Tesla Holding** nach einem Markenrechtsstreit im Jahr 2010.^[4]

Der **Tesla Roadster**, gebaut zwischen 2008 und 2012, war das erste Automobil mit einer **Batterie aus Lithium-Ionen-Zellen**,^[5] wie sie zum Beispiel in Laptops verwendet werden. Danach wurde die Oberklasse-Limousine **Tesla Model S** entwickelt, von der von Juni 2012 bis Ende 2015 über 100.000 Exemplare verkauft wurden. Ein Ableger davon ist der etwas größere SUV/Van-Crossover **Model X** mit Flügeltüren.

Gegründet wurde die Firma im Juli 2003 von **Martin Eberhard** und **Marc Tarpenning**, die 2008 ausschieden. Im Frühjahr 2004 stiegen Risikokapital-Investoren ein, **Elon Musk** wurde Aufsichtsratsvorsitzender und avancierte bald zur prägenden Figur von Tesla. Der Firmensitz ist **Palo Alto** im **Silicon Valley**. Ende 2017 beschäftigte das Unternehmen rund 37.500 Mitarbeiter. Tesla produziert derzeit die Modelle 3, S und X in **Fremont (Kalifornien)**, wobei das Model S zusätzlich aus **Completely-Knocked-Down**-Bausätzen in Tilburg in den Niederlanden gefertigt wird.^{[6][7][8]}

Tesla verkauft (Stand 2010) unter anderem an **Daimler** und **Toyota** verschiedene Komponenten für deren elektrische **Antriebsstränge**.^[9]

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3.1 Roadster
3.1.1 Bauform 2008

Tesla, Inc.

Rechtsform Incorporated
ISIN US88160R1014
Gründung 2003
Sitz Palo Alto, Vereinigte Staaten
Leitung Elon Musk (Chairman und CEO)
Mitarbeiter 37.543 (31. Dez. 2017)^[1]
Umsatz 11,759 Mrd. US-Dollar (2017)^[1]
Branche Automobilindustrie, Solarindustrie, Energiespeicher
Website www.tesla.com



Aktuelles **Tesla Model S** an einem

Vielen Dank!

Fragen?

TOPIC MODEL

- jedes Dokument ist eine Verteilung von Themen
- jedes Thema ist eine Verteilung über das Vokabular
- finde bestmögliche Zuordnung (Inferenz - Gibbs-Sampler)