

VISUALIZING TEXT

Petra Isenberg

RECAP

STRUCTURED DATA



0.103	0.176	0.387	0.300	0.379
0.333	0.384	0.564	0.587	0.857
0.421	0.309	0.654	0.729	0.228
0.266	0.750	1.056	0.936	0.911
0.225	0.326	0.643	0.337	0.721
0.187	0.586	0.529	0.340	0.829
0.153	0.485	0.560	0.428	0.628

UNSTRUCTURED DATA



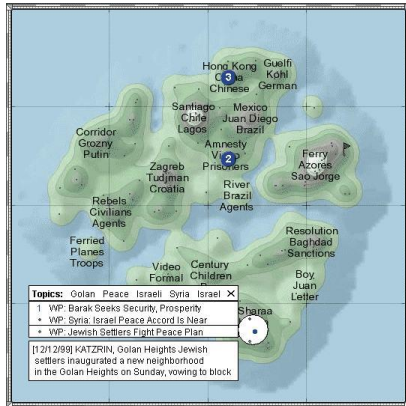
(TODAY)

VISUALIZING TEXT

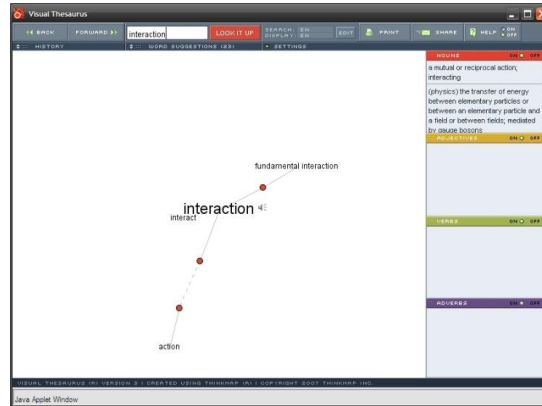
TEXT?

WHY

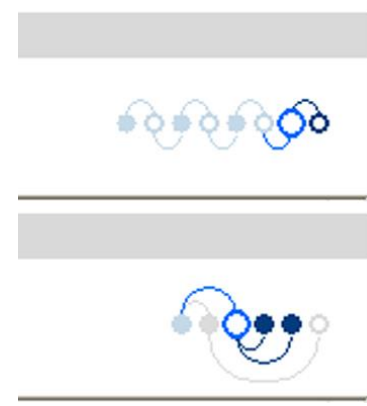
- To assist information retrieval
- To enable linguistic analysis
- To augment analytics on mixed data



Themescape



Visual Thesaurus



Thread Arcs

WHY

UNDERSTANDING: GET THE “GIST” OF A DOCUMENT

GROUPING: CLUSTER FOR OVERVIEW OR CLASSIFICATION

COMPARE: COMPARE DOCUMENT COLLECTIONS, OR
INSPECT EVOLUTION OF COLLECTION OVER TIME

CORRELATE: COMPARE PATTERNS IN TEXT TO THOSE IN
OTHER DATA, E.G., CORRELATE WITH SOCIAL NETWORK

WHAT IS TEXT

DOCUMENTS

ARTICLES, BOOKS AND NOVELS
COMPUTER PROGRAMS
E-MAILS, WEB PAGES, BLOGS
TAGS, COMMENTS

COLLECTION OF DOCUMENTS

MESSAGES (E-MAIL, BLOGS, TAGS, COMMENTS)
SOCIAL NETWORKS (PERSONAL PROFILES)
ACADEMIC COLLABORATIONS (PUBLICATIONS)
EVEN WHOLE LIBRARIES, WEBSITES, SOCIAL NETWORKS

DIFFICULT DATA

- Too much data – what to use?
 - Millions of blog posts,
 - Hundreds of thousands of news stories,
 - 183 billion emails,
 - ... **per day**
- Data is noisy:
 - 70-72% of email is spam
 - Text contains section headings, figure captions, and direct quotes
 -

ONCE YOU HAVE THE DATA...

- Most meaning comes from our minds and common understanding.
- “How much is that doggy in the window?”
 - how much: social system of barter and trade (not the size of the dog)
 - “doggy” implies childlike, plaintive, probably cannot do the purchasing on their own
 - “in the window” implies behind a store window, not really inside a window, requires notion of window shopping

(Hearst, 2006)

LANGUAGE IS AMBIGUOUS

- Words and phrases can have many meanings, determined by context and world knowledge.
 - Interesting language is often figurative:
 - “Tables encourage casual interaction.”
- vs
- “I encouraged her to take a day off.”

LANGUAGE IS AMBIGUOUS

- I saw Pathfinder on Mars with a telescope.
- Pathfinder photographed Mars.
- The Pathfinder photograph mars our perception of a lifeless planet.
- The Pathfinder photograph from Ford has arrived.
- The Pathfinder forded the river without marring its paint job.

(Hearst, 2006)

VISUAL CONSIDERATIONS

Supporters of Martin, who has been jailed without trial for more than two years, are calling on Prime Minister Stephen Harper to ask Mexican president Felipe Calderon to release Martin. Text is not preattentive under a section of the Mexican constitution that allows the government to expel undesirables from the country. Martin's supporters believe she has no chance of a fair trial in Mexico. Neither does Waage.

VISUAL CONSIDERATIONS

Supporters of Martin, who has been jailed without trial for more than two years, are calling on Prime Minister Stephen Harper to ask Mexican president Felipe Calderon to release Martin **text is not preattentive** under a section of the Mexican constitution that allows the government to expel undesirables from the country. Martin's supporters believe she has no chance of a fair trial in Mexico. Neither does Waage.

VISUAL CONSIDERATIONS

- *Text readability is dependent on size, orientation, font, clutter...*



VISUAL CONSIDERATIONS

- Text readability is dependent on size, orientation, font, clutter...
- More likely to need large amounts of text in language visualization

VISUALIZING LANGUAGE IS ALSO EASY!

- SO much data available for analysis
- (Mostly) readily computer readable
- Simple techniques can give instant summaries

OUTLINE

- **TEXT AS DATA**
- **VISUALIZING DOCUMENT CONTENT**
- **EVOLVING DOCUMENTS**
- **DOCUMENT COLLECTIONS**

TEXT AS DATA

Words are
the basic
unit of data.

WORD-LEVEL ATTRIBUTES

- WORD LENGTH
- PART OF SPEECH (NOUN, VERB, ADJECTIVE, ETC.)
- FORMAT (*ITALIC*, UNDERLINE, ETC.)
- LANGUAGE (ENGLISH? LATIN? JAPANESE?)
- FREQUENCY / DIFFICULTY (IS IT COMMON?)
- SENTIMENT (POSITIVE OR NEGATIVE CONNOTATION)
- SYNONYMS / ANTONYMS / ETYMOLOGY (OTHER MEANINGS? ROOTS?)
- ENTITIES (e.g. “Calgary”, “Obama”, “Telus”)
- ... AND MANY MORE

AGGREGATION

REPETITION
PLAGARISM
SHARED
ENTITIES
AUTHOR
STYLE

COLLECTION



• DOCUMENT



• SECTION



• PAGE



• PARAGRAPH



• SENTENCE



• WORD

TENSE
SENTIMENT
SENTENCE
LENGTH
READING

LINGUISTIC METHODS

- Word Counting
- Word Scoring
- Stemming
- Stop Word Removal
- Part of Speech Tagging
- Parsing
- Word Sense Disambiguation
- Named Entity Recognition
- Semantic Categorization
- Sentiment Analysis
- Topic Modeling (some caveats)

WHAT ABOUT THESE WORDS?

automate

automates

automatic

automation



automat

~~a, an, the, to, ...~~

“New York”

“Ban Ki-moon”

“Manchester United”

STEMMING

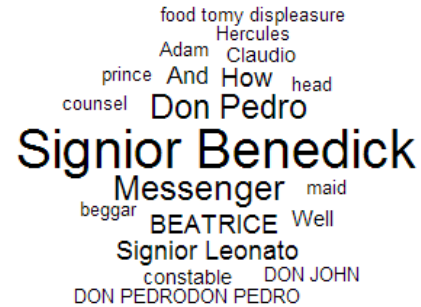
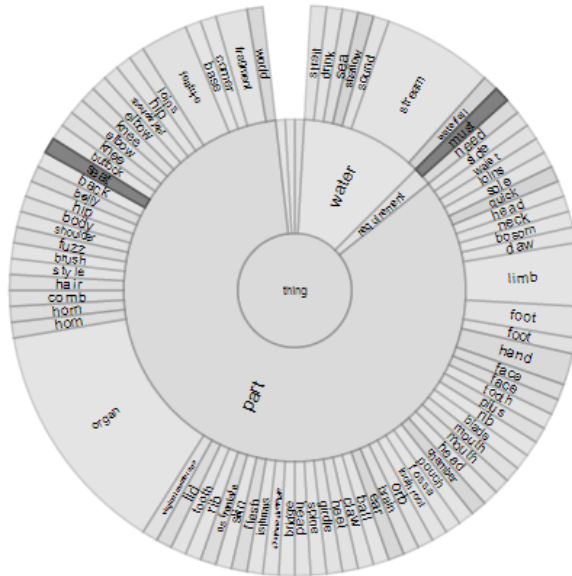
- Reduce words to their 'stems' by removing endings (morphology)
 - running -> run
 - runs -> run
- A good way to increase signal and reduce fracturing of the corpus if there aren't many words.
- Note: Keep the original words somewhere! Also keep the case if you choose to lowercase the word; you never know when you'll need this data

STOP WORD REMOVAL

- Common words such as “and”, “the”, “I” are removed from view to highlight content words
- Domain specific stop words, e.g. in legal domain:
 - Court, attorney, honour, plaintiff, etc.
- Caution! These words have been shown to be useful for stylistic analysis! When working with text corpora, KEEP EVERYTHING.

NAMED ENTITY RECOGNITION

- What are the people, places in the text?
- Use NLTK – it's very good at this.



Much Ado About Nothing



TEXT PROCESSING

TOKENIZATION: SEGMENT TEXT INTO TERMS

ENTITIES? "SAN FRANCISCO", "O'CONNOR", "U.S.A."

REMOVE STOP WORDS? "A", "AN", "THE", "TO", "BE"

N-GRAMS? CAN TAKE WORDS IN 2-WORD GROUPS (BI-GRAMS), 3-WORD (TRI-GRAMS), ETC.

STEMMING: GROUP TOGETHER DIFFERENT FORMS

ROOTS: VISUALIZATION(S), VISUALIZE(S), VISUALLY → VISUAL

LEMMATIZATION: GOES, WENT, GONE → GO

FOR VISUALIZATION, SOMETIMES NEED TO REVERSE STEMMING FOR LABELS

SIMPLE SOLUTION: MAP FROM STEM TO THE MOST FREQUENT WORD

RESULT: ORDERED STREAM OF TERMS

TEXT PROCESSING

“The quick brown fox jumps over the lazy dog.”

TOKENIZE (N=1)

[The], [quick], [brown], [fox], [jumps], [over], [the], [lazy], [dog].

TOKENIZE (N=1), REMOVE STOPWORDS, STEM

[quick], [brown], [fox], [jump], [over], [lazy], [dog]

TOKENIZE (N=2)

[the quick], [quick brown], [brown fox], [fox jumps], [jumps over], [over the]...

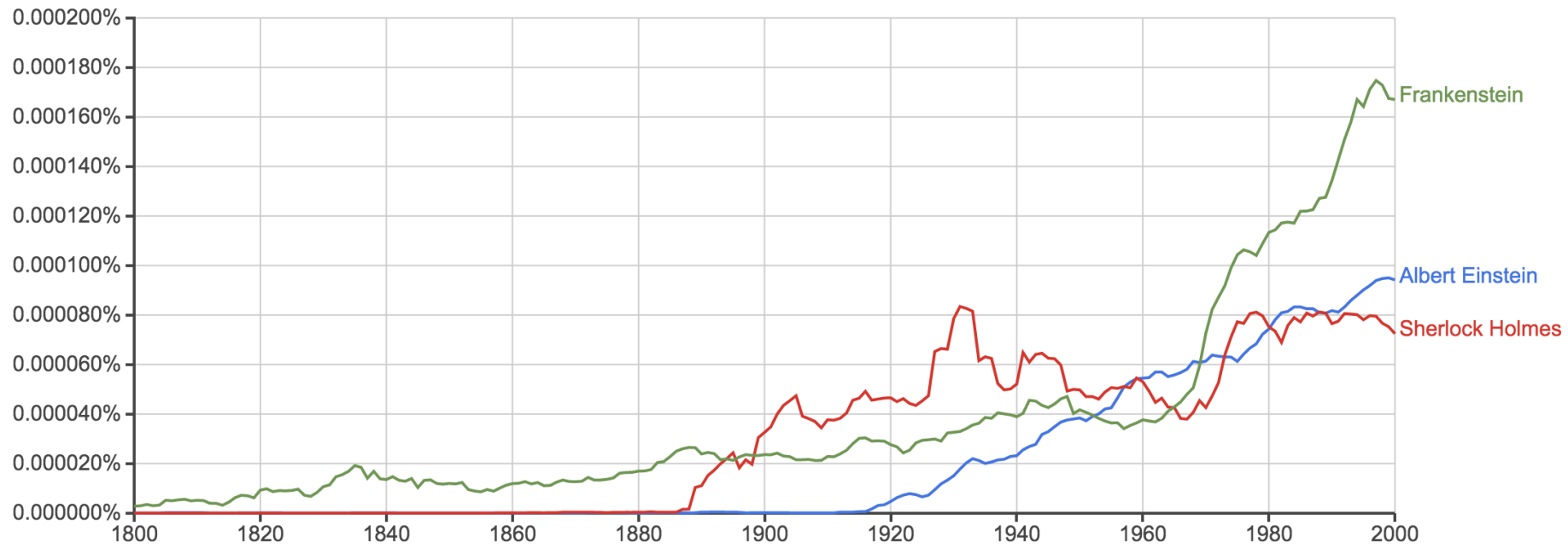
TOKENIZE (N=5)

[the quick brown fox jumps], [quick brown fox jumps over], [brown fox jumps over ...

Google Books Ngram Viewer

Graph these comma-separated phrases: case-insensitive

between and from the corpus with smoothing of [Search lots of books](#)



(click on line/label for focus)

NLTK (NATURAL LANGUAGE TOOLKIT)

Tokenize and tag some text:

```
>>> import nltk
>>> sentence = """At eight o'clock on Thursday morning
... Arthur didn't feel very good."""
>>> tokens = nltk.word_tokenize(sentence)
>>> tokens
['At', 'eight', "o'clock", 'on', 'Thursday', 'morning',
'Arthur', 'did', "n't", 'feel', 'very', 'good', '.']
>>> tagged = nltk.pos_tag(tokens)
>>> tagged[0:6]
[('At', 'IN'), ('eight', 'CD'), ("o'clock", 'JJ'), ('on', 'IN'),
('Thursday', 'NNP'), ('morning', 'NN')]
```

NLTK.org
Python

Identify named entities:

```
>>> entities = nltk.chunk.ne_chunk(tagged)
>>> entities
Tree('S', [(('At', 'IN'), ('eight', 'CD'), ("o'clock", 'JJ'),
('on', 'IN'), ('Thursday', 'NNP'), ('morning', 'NN')),
Tree('PERSON', [(('Arthur', 'NNP')]),
('did', 'VBD'), ("n't", 'RB'), ('feel', 'VB'),
('very', 'RB'), ('good', 'JJ'), ('.', '.')])])
```

DOCUMENT

CONTENT

SKETCHING

SKETCHING: VISUALIZE

IMAGINE YOU HAVE 20
YEARS OF UNIVERSITY
PH.D. THESES:

YEAR

DEPARTMENT

AUTHOR

ADVISOR

COMMITTEE

COMPLETE TEXT

GROUPS OF 3

TASK:

**1) VISUALIZE THE MOST
IMPORTANT CONTENT
FROM A SINGLE THESIS.**

**2) VISUALIZE HOW
SIMILAR THESES FROM
EACH DEPARTMENT
ARE TO THESES FROM
OTHER DEPARTMENTS.**

(~10 MINUTES)

EXAMPLE

Tools & Strategies for Social Data Analysis

by

Wesley Jay Willett

A dissertation submitted in partial satisfaction of the
requirements for the degree of
Doctor of Philosophy

in

Computer Science

in the

Graduate Division

of the

University of California, Berkeley

THESIS WESLEY WILLETT

TAG CLOUDS

WORD COUNT

additional air **analysis** **analysts** annotation applications approach asked author
average based build **chart** citizen **clustering** collaborative collection
comments commentspace community complete condition contributions
crowd crowdsourcing **data** datasets design different discussion evidence example
experiment experts **explanations** explore features figure
filtering **generated** group help hypotheses hypothesis identify including indicating
information interactive interface knowledge **links** members microtasks multiple novice number oae
observations organize **participants** phases pp proceedings process produced
prompt **provide quality** questions rate redundant requires responses results score
sense share showing similar site **social source** specific state strategies study support
systems **tags** **tasks** **tools** understanding used **users** **views**
visualization web work **workers**

<http://tagcrowd.com/>

THESIS WESLEY WILLETT

TAG CLOUDS

WORD COUNT



WHAT'S PROBLEMS DO YOU SEE WITH TAG CLOUDS?

additional air **analysis** analysts annotation applications approach asked author
average based build **chart** citizen **clustering** collaborative collection
comments commentspace community complete condition contributions
crowd crowdsourcing **data** datasets design different discussion evidence example
experiment experts **explanations** explore features figure
filtering **generated** group help hypotheses hypothesis identify including indicating
information interactive interface knowledge **links** members microtasks multiple novice number oae
observations organize **participants** phases pp proceedings process produced
prompt **provide quality** questions rate redundant requires responses results score
sense share showing similar site **social source** specific state strategies study support
systems **tags tasks tools** understanding used **users views**
visualization web work **workers**



TAG CLOUDS

STRENGTHS

CAN HELP WITH GISTING AND INITIAL QUERY FORMATION.

WEAKNESSES

SUB-OPTIMAL VISUAL ENCODING (SIZE VS. POSITION)

INACCURATE SIZE ENCODING (LONG WORDS ARE BIGGER)

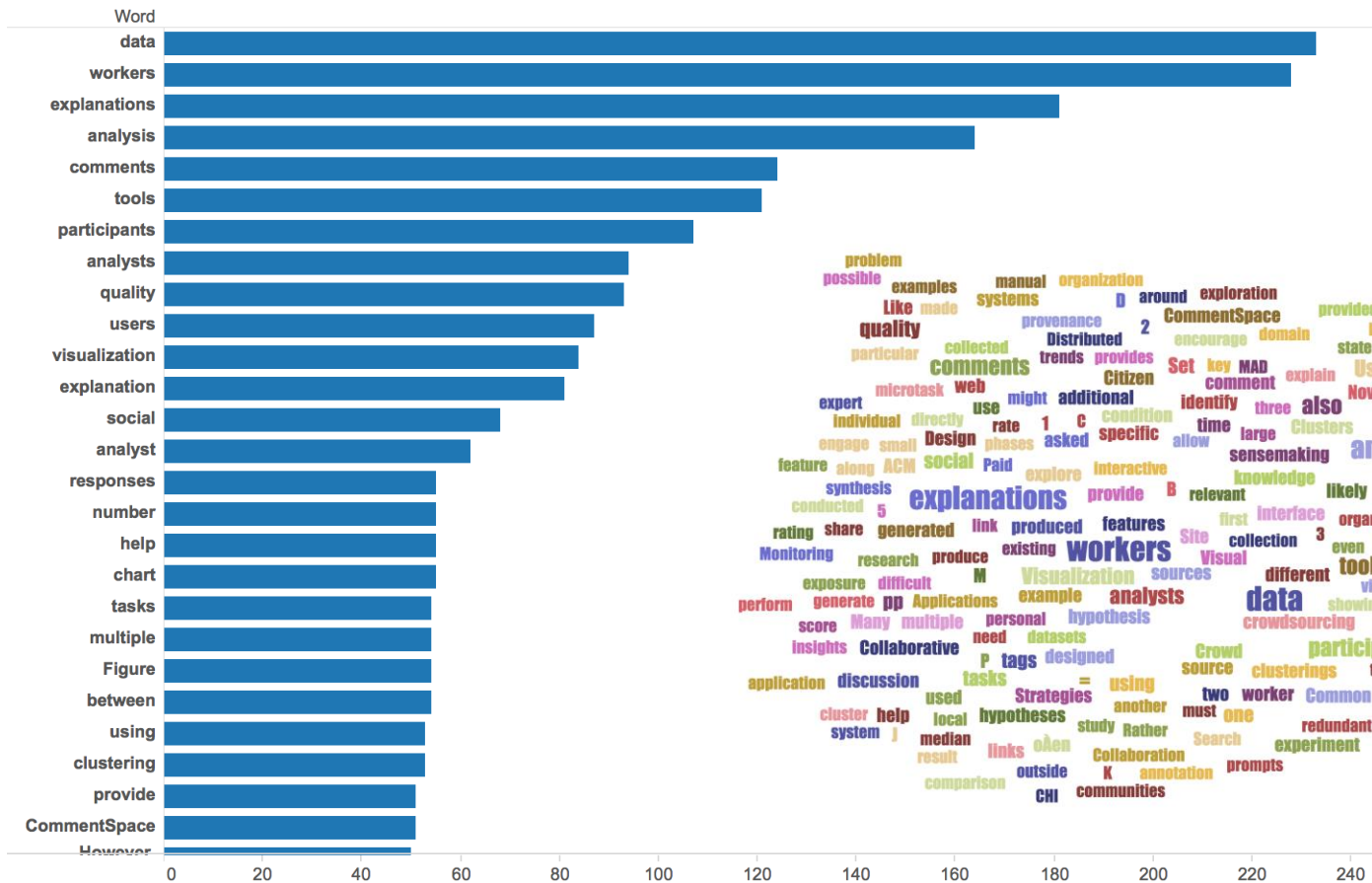
MAY NOT FACILITATE COMPARISON (UNSTABLE LAYOUT)

- ORDER USUALLY MEANINGLESS (USUALLY ALPHABETICAL OR RANDOM)

TERM FREQUENCY MAY NOT BE MEANINGFUL

DOES NOT SHOW THE STRUCTURE OF THE TEXT

WORD COUNTS



WORDCOUNT

WORDCOUNT

◀ PREVIOUS WORD

NEXT WORD ▶

the of and to ain that it is was i for on you he be with as by a have are this no but had his they from she which we in there were do you it is has you'll find it when you're about pen and ink they're

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

CURRENT WORD

FIND WORD:

BY RANK:

REQUESTED WORD: THE

RANK: 1

ARCHIVE

COUNT

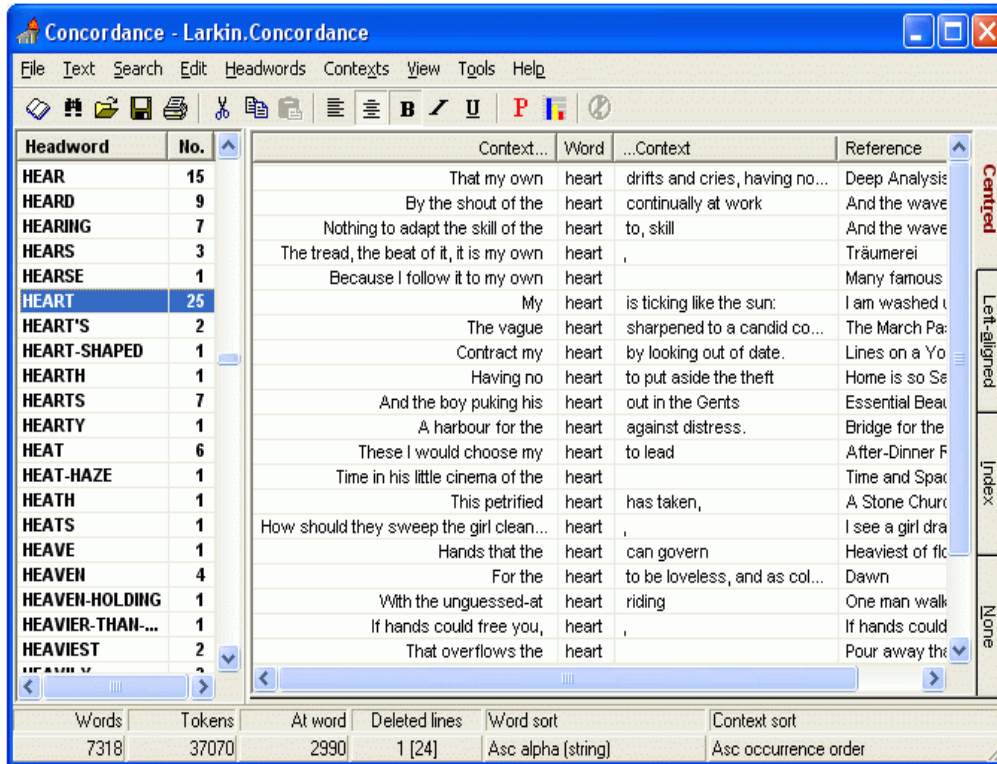


JONATHAN HARRIS

<http://wordcount.org>

CONCORDANCE

WHAT IS THE COMMON LOCAL CONTEXT OF A TERM?



The screenshot shows the 'Concordance - Larkin Concordance' application window. The main area displays a table of concordance results for the word 'HEART'. The table has four columns: 'Headword', 'No.', 'Context...', 'Word', '...Context', and 'Reference'. The 'HEART' entry is highlighted in blue. The 'Context...' column shows the surrounding text for each occurrence, and the 'Word' column shows the word 'heart' in each instance. The 'Reference' column lists the source text for each occurrence.

Headword	No.	Context...	Word	...Context	Reference
HEAR	15	That my own	heart	drifts and cries, having no...	Deep Analysis
HEARD	9	By the shout of the	heart	continually at work	And the wave
HEARING	7	Nothing to adapt the skill of the	heart	to, skill	And the wave
HEARS	3	The tread, the beat of it, it is my own	heart	,	Träumerei
HEARSE	1	Because I follow it to my own	heart		Many famous
HEART	25	My	heart	is ticking like the sun:	I am washed t
HEART'S	2	The vague	heart	sharpened to a candid co...	The March Pa
HEART-SHAPED	1	Contract my	heart	by looking out of date.	Lines on a Yo
HEARTH	1	Having no	heart	to put aside the theft	Home is so Se
HEARTS	7	And the boy puking his	heart	out in the Gents	Essential Bea
HEARTY	1	A harbour for the	heart	against distress.	Bridge for the
HEAT	6	These I would choose my	heart	to lead	After-Dinner F
HEAT-HAZE	1	Time in his little cinema of the	heart		Time and Spa
HEATH	1	This petrified	heart	has taken,	A Stone Chur
HEATS	1	How should they sweep the girl clean...	heart	,	I see a girl dra
HEAVE	1	Hands that the	heart	can govern	Heaviest of fl
HEAVEN	4	For the	heart	to be loveless, and as col...	Dawn
HEAVEN-HOLDING	1	With the unguessed-at	heart	riding	One man walk
HEAVIER-THAN...	1	If hands could free you,	heart	,	If hands could
HEAVIEST	2	That overflows the	heart		Pour away th

At the bottom of the window, there is a summary table:

Words	Tokens	At word	Deleted lines	Word sort	Context sort
7318	37070	2990	1 [24]	Asc alpha (string)	Asc occurrence order

WORD TREES

- cats are better than dogs
- cats eat kibble
- cats are better than hamsters
- cats are awesome
- cats are people too
- cats eat mice
- cats meowing
- cats in the cradle
- cats eat mice
- cats in the cradle lyrics
- cats eat kibble
- cats for adoption
- cats are family
- cats eat mice
- cats are better than kittens
- cats are evil
- cats are weird
- cats eat mice



love the

lord

thy god

with all

thine heart , and with all thy soul ,
 thy heart , and with all thy soul , and with all thy

and with all thy might .
 that thou mayest live .

mind
 strength , a

and

keep his charge , and his statutes , and his judgments , and his commandments , always .
 to walk ever in his ways ; then shalt thou add three cities more for thee , beside these three : 19
 that thou mayest obey his voice , and that thou mayest cleave unto him : for he is thy life , and t
 to walk in his ways , and to keep his commandments and his statutes and his judgments , that thou mayest liv

and to

serve him with all your heart and with all your soul , 11 : 14 that i will give you the rain of your lar
 walk in all his ways , and to keep his commandments , and to cleave unto him , and to serve him
 to walk in all his ways , and to cleave unto him ; 11 : 23 then will the lord drive out all these nations from

your god

with all your heart and with all your soul .

all ye his saints : for the lord preserveth the faithful , and plentifully rewardeth the proud doer .
 hate evil : he preserveth the souls of his saints ; he delivereth them out of the hand of the wicked .
 because he hath heard my voice and my supplications .

name of the lord , to be his servants , every one that keepeth the sabbath from polluting it , and taketh hold of my covenant
 good , and establish judgment in the gate : it may be that the lord god of hosts will be gracious unto the remnant of joseph
 evil ; who pluck off their skin from off them , and their flesh from off their bones ; 3 : 3 who also eat the
 truth and peace .

other ; or else he will hold to the one , and despise the other . ye cannot serve god and mammon .

6 : 25 therefore i say unto
 16 : 14 and the pharisees

uppermost

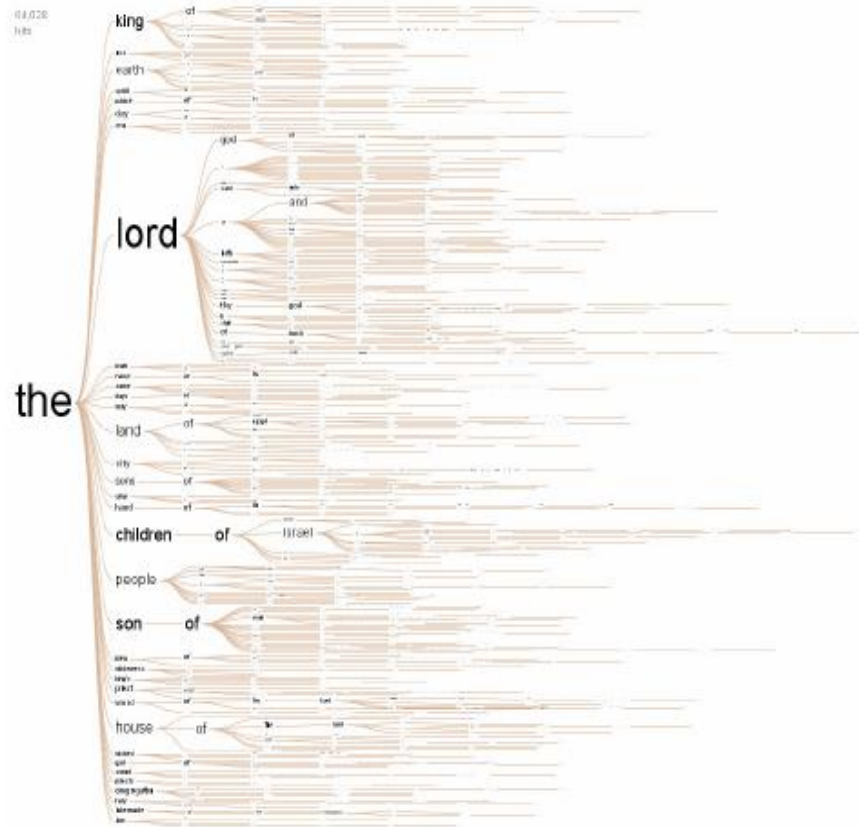
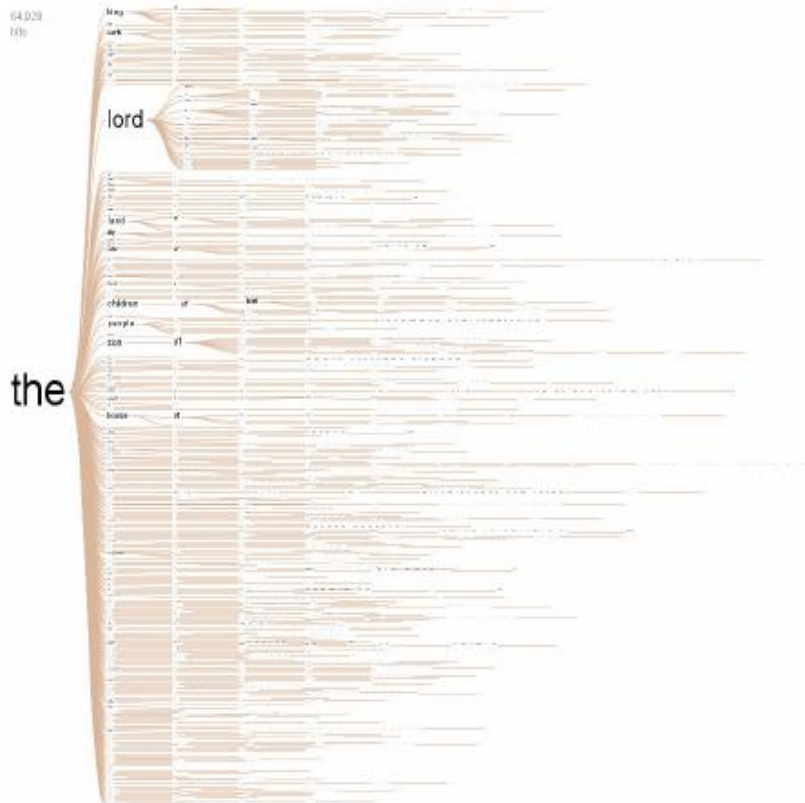
rooms at feasts , and the chief seats in the synagogues , 23 : 7 and greetings in the markets , and to be called of
 seats in the synagogues , and greetings in the markets .

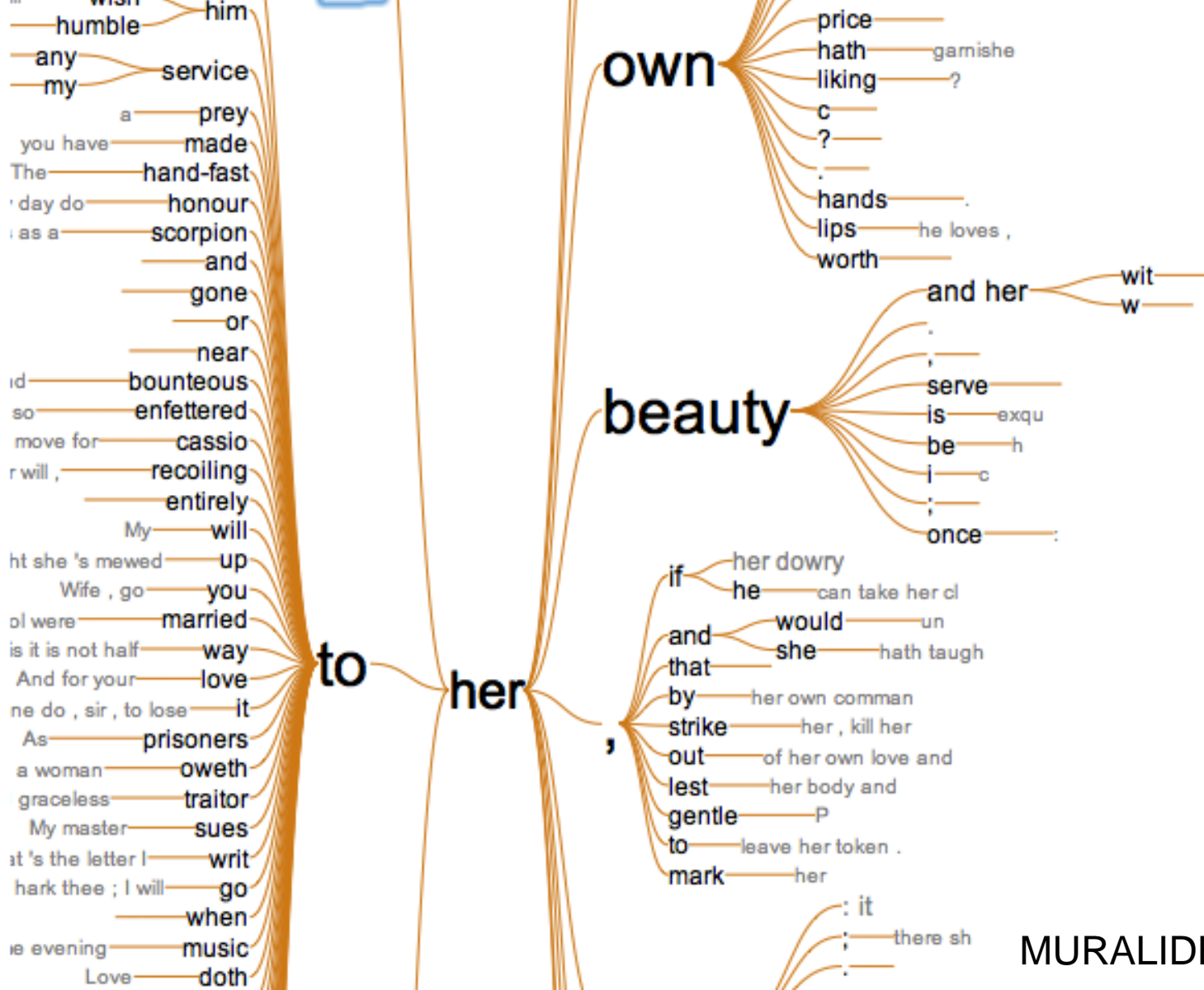
father

; and as the father gave me commandment , even so i do .
 hath bestowed upon us , that we should be called the sons of god : therefore the world knoweth us not , because it knew him

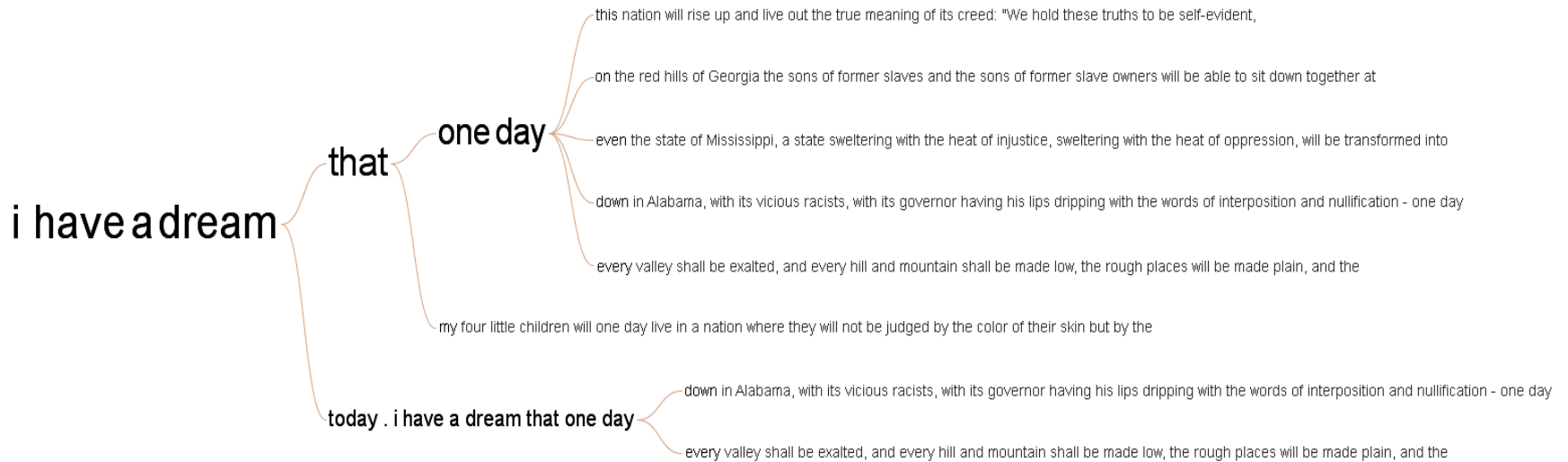
brotherhood .
 world , the love of the father is not in him .
 brethren .
 children of god , when we love god , and keep his commandments .

FILTER INFREQUENT RUNS





RECURRENT THEMES IN SPEECH



GLIMPSES OF STRUCTURE

- CONCORDANCES SHOW LOCAL, REPEATED STRUCTURE
- BUT WHAT ABOUT OTHER TYPES OF PATTERNS?
- FOR EXAMPLE
- LEXICAL: <A> at
- SYNTACTIC: <Noun> <Verb> <Object>

PHRASE NETS

LOOK FOR SPECIFIC LINKING PATTERNS IN THE TEXT:

'A **AND** B', 'A **AT** B', 'A **OF** B', ETC

COULD BE OUTPUT OF REGEXP OR PARSER

VISUALIZE EXTRACTED PATTERNS IN A NODE-LINK VIEW

OCCURRENCES = NODE SIZE

PATTERN POSITION = EDGE DIRECTION

Showing 73 of 1719 terms

X and Y

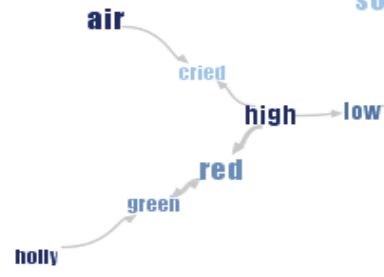
Select a phrase

- word1 and word2
- word1 's word2
- word1 of the word2
- word1 the word2
- word1 a word2
- word1 at word2
- word1 is word2
- word1 [space] word2

or enter your own

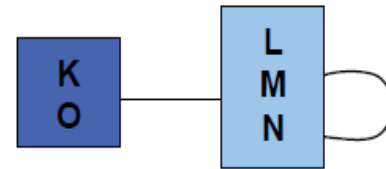
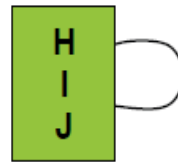
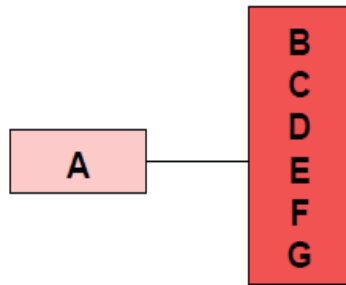
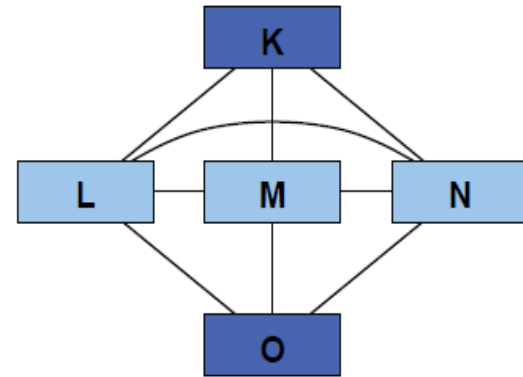
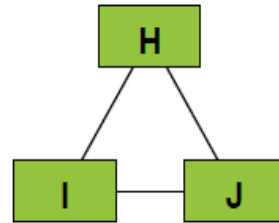
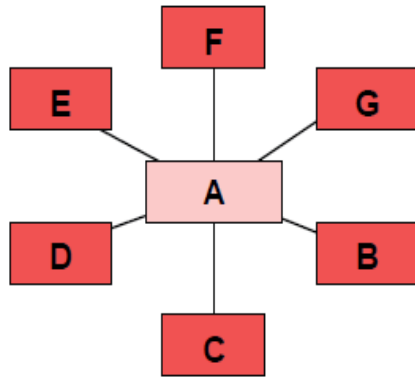
Filters
 Show top:
 Hide common words

Zoom
 In Out Reset



PORTRAIT OF THE ARTIST AS A YOUNG MAN
 JAMES JOYCE

NODE GROUPING



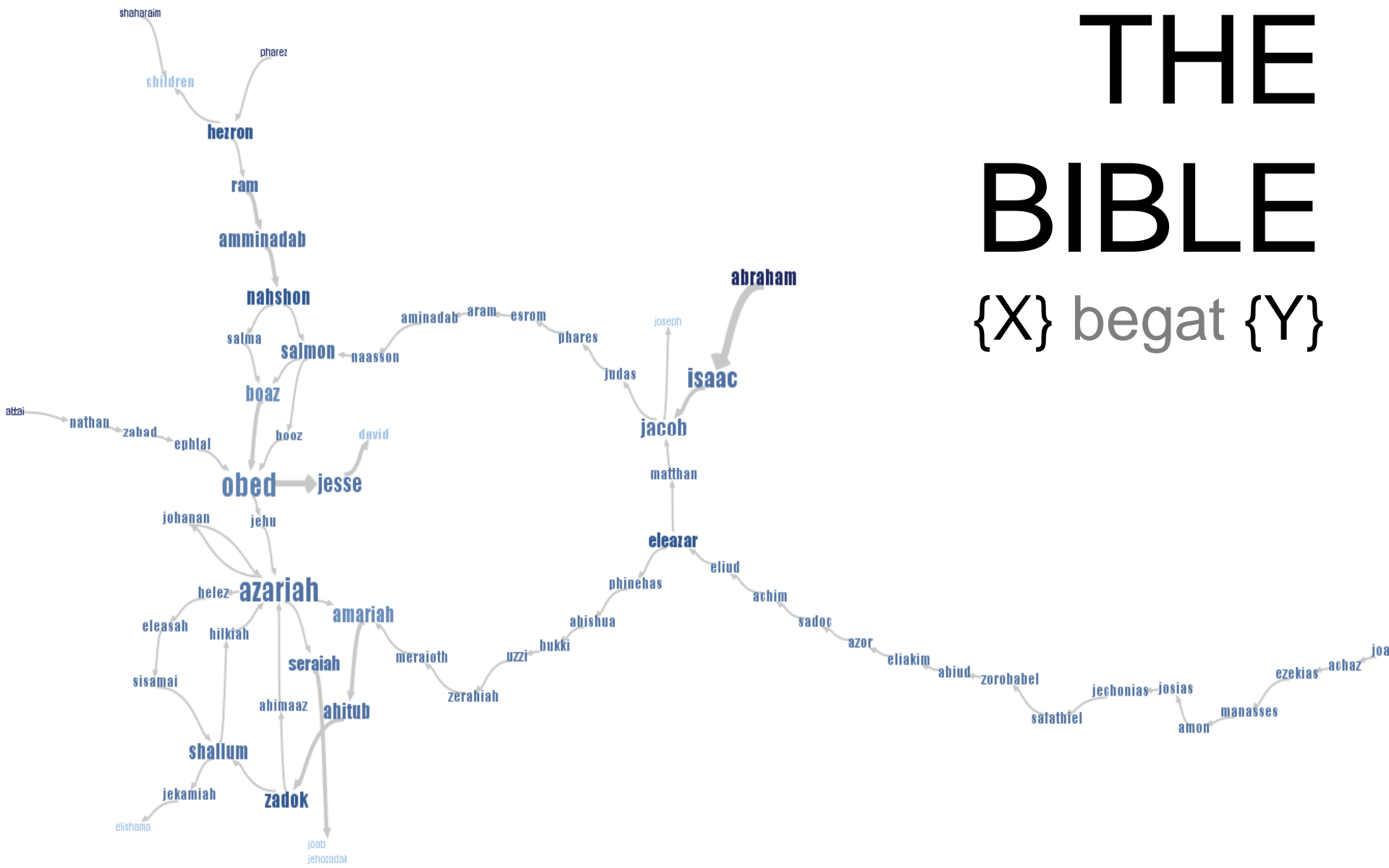
(a)

(b)

(c)

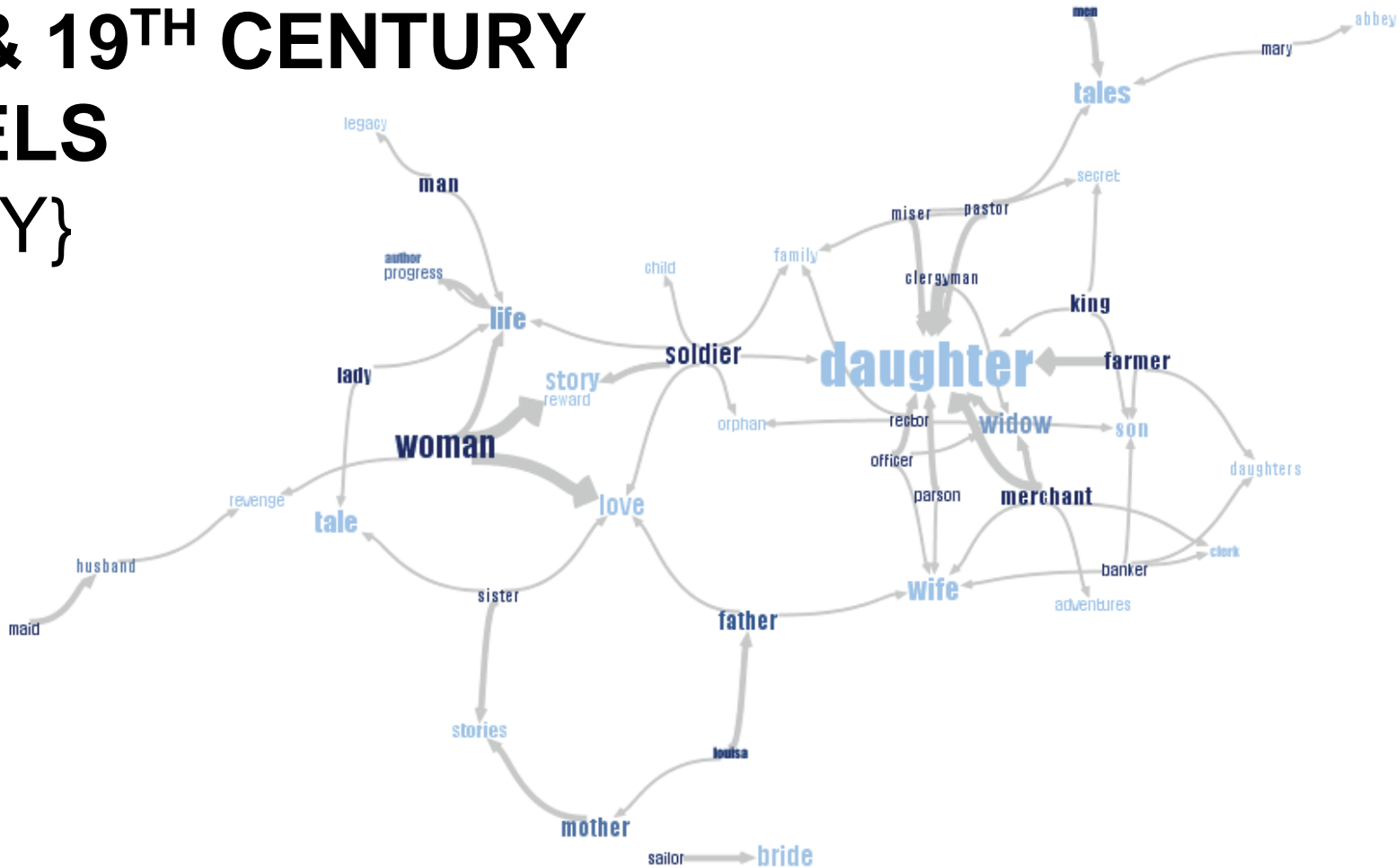
THE BIBLE

{X} begat {Y}



18TH & 19TH CENTURY NOVELS

{X}'s {Y}



RHYME, SPEECH, ETC.

POEMAGE McCurdy et al. 2016

Poemage v0.1

Set View

SONIC RHYMES

Identical Rhyme/Rhyme Riche

Perfect Masculine

Perfect Feminine

Perfect Dactylic

Semirhyme

Syllabic Rhyme

Consonant Slant Rhyme

Vowel Slant Rhyme

Pararhyme

Syllabic 2 Rhyme

Alliteration

Assonance

Consonance

Poem View

Machinations Calcite
Clark Coolidge

acetone imprinted
oblique swatch on the skin car barn oil wall
ocarina & mumps
much wet green
I'd leave sole key to this game to my friend, sheep water cat

actor impressed
weaving candle turn on computer cigarette, paper wall
tarheels & balance
a lot of yellow stick neck
He'll have to hurry & carry away, to my blue friend hustling bringing
his moon & car

agate inked
merry melodies drool on shank of wet lead star tool
crayon & sands
length of granite buck drill
It's sucking up the strand, his crystal flag, & the eels tube for that
their parade swizzle fun

arctic suck
splinter dry -ice spazz duke -ing ace supper at church
hard pinks & sponge breath
many forarms drift
Roller window going up on I repeat my offer food list in iron flakes

Path View

Modes: 1 2 3 shuffle nodes

Machinations Calcite
acetone
oblique swatch skin car
sole key this sheet cat
actor candle computer cigarette
stick neck carry hustling
shank
sands buck
sucking
arctic buck
ice luke ace supper at church
swizzle
that,

clear beautiful mess

hover word show uncertainty custom set

show words show context fill intersecting paths

CONTEXT SLIDER

Poemage v0.1

REVISIT YOUR SKETCHES?

TASK:

1) VISUALIZE THE MOST IMPORTANT CONTENT FROM A SINGLE THESIS.

ARE YOUR VISUALIZATION CHOICES **EFFECTIVE**?

DOES THE VIS CAPTURE THE **LENGTH, FORM, AND POSITION** OF THE IMPORTANT CONTENT?

DO YOU SHOW OR CONNECT BACK TO THE **ORIGINAL TEXT**?

EVOLVING DOCUMENTS

VISUALIZING REVISION HISTORY

HOW TO DEPICT CONTRIBUTIONS AND CHANGES OVER TIME?

Revision history	
October 30, 7:33 AM	■ anonymous
October 29, 3:13 PM	■ anonymous
October 29, 10:37 AM	■ anonymous
October 29, 9:57 AM	■ anonymous
October 29, 9:02 AM	■ anonymous
October 29, 5:21 AM	■ anonymous
October 28, 9:43 PM	■ anonymous
October 28, 4:48 PM	■ Wesley Willett

Visit the main page



WIKIPEDIA
The Free Encyclopedia

Main page
Contents
Featured content
Current events
Random article
Donate to Wikipedia
Wikipedia store

Interaction
Help
About Wikipedia
Community portal
Recent changes
Contact page

Tools
What links here
Related changes
Atom
Upload file
Special pages
Page information
Wikidata item

Languages

Article Talk

Visualization: Revision history

View logs for this page

Browse history

From year (and earlier): 2016 From month (and earlier): all Tag filter: Show

For any version listed below, click on its date to view it. For more help, see [Help:Page history](#) and [Help:Edit summary](#).

External tools: [Revision history statistics](#) · [Revision history search](#) · [Edits by user](#) · [Number of watchers](#) · [Page view statistics](#)

(cur) = difference from current version, (prev) = difference from preceding version, m = minor edit, → = section edit, ← = automatic edit summary (newest | oldest) View (newer 50 | older 50) (20 | 50 | 100 | 250 | 500)

Compare selected revisions

- [\(cur | prev\)](#) [17:57, 5 February 2016](#) Biscuitin (talk | contribs) . . (1,017 bytes) (+29) . . *(add link)* (undo)
- [\(cur | prev\)](#) [11:49, 10 April 2015](#) 87.103.115.78 (talk) . . (988 bytes) (-14) . . *(oops)* (undo)
- [\(cur | prev\)](#) [11:49, 10 April 2015](#) 87.103.115.78 (talk) . . (1,002 bytes) (-23) . . *(fix spelling)* (undo)
- [\(cur | prev\)](#) [14:30, 21 February 2015](#) Everymorning (talk | contribs) . . (1,025 bytes) (+20) . . *(add guided imagery)* (undo)
- [\(cur | prev\)](#) [13:30, 17 June 2014](#) Curious11 (talk | contribs) m . . (1,005 bytes) (+44) . . *(Sport psychology topic I initially was looking for...)* (undo)
- [\(cur | prev\)](#) [09:34, 12 February 2014](#) 134.246.168.123 (talk) . . (961 bytes) (+19) . . (undo)
- [\(cur | prev\)](#) [09:32, 12 February 2014](#) ClueBot NG (talk | contribs) m . . (942 bytes) (+820) . . *(Reverting possible vandalism by 134.246.168. (Bot))* (undo)
- [\(cur | prev\)](#) [09:32, 12 February 2014](#) 134.246.168.123 (talk) . . (122 bytes) (-820) . . (undo)
- [\(cur | prev\)](#) [05:19, 2 March 2013](#) Legobot (talk | contribs) m . . (942 bytes) (-42) . . *(Bot: Migrating langlinks to WP:Wikidata - d:q1696827)* (undo)
- [\(cur | prev\)](#) [23:28, 3 January 2013](#) Robofish (talk | contribs) . . (984 bytes) (-28) . . *(removed link to deleted article)* (undo)
- [\(cur | prev\)](#) [18:31, 21 March 2012](#) Jojan (talk | contribs) m . . (1,012 bytes) (+14) . . *(visualisation and visualization in wiktionary template)* (undo)
- [\(cur | prev\)](#) [19:11, 7 November 2011](#) DGRichard (talk | contribs) m . . (998 bytes) (+28) . . *(Added one more reference)* (undo)
- [\(cur | prev\)](#) [07:04, 25 September 2011](#) Cullen328 (talk | contribs) . . (970 bytes) (+23) . . *(add see also)* (undo)
- [\(cur | prev\)](#) [00:14, 9 July 2010](#) Squids and Chips (talk | contribs) m . . (947 bytes) (-19) . . *(remove {{Incoming links}})* (undo)
- [\(cur | prev\)](#) [15:29, 19 February 2010](#) Mdd (talk | contribs) . . (966 bytes) (+42) . . *(+ de:Visualisierung (Begriffsklärung))* (undo)
- [\(cur | prev\)](#) [15:30, 3 August 2009](#) Funandtrvl (talk | contribs) m . . (924 bytes) (-56) . . *(rm duplicates, copy-edit)* (undo)
- [\(cur | prev\)](#) [15:27, 3 August 2009](#) Funandtrvl (talk | contribs) m . . (980 bytes) (+20) . . *(WikiCleaner 0.90 - Repairing link to disambiguation)* (undo)
- [\(cur | prev\)](#) [03:25, 29 July 2009](#) FortdJ33 (talk | contribs) m . . (960 bytes) (-1) . . *(Clean up using AWB)* (undo)
- [\(cur | prev\)](#) [14:28, 28 July 2009](#) FortdJ33 (talk | contribs) m . . (961 bytes) (+19) . . *(Added tag)* (undo)
- [\(cur | prev\)](#) [13:29, 18 June 2009](#) C.J.L.L. Wright (talk | contribs) m . . (942 bytes) (-39) . . *(Reverted edits by Vizbi (talk) to last version by M.ne)* (undo)
- [\(cur | prev\)](#) [13:15, 18 June 2009](#) Vizbi (talk | contribs) . . (981 bytes) (+39) . . (undo)
- [\(cur | prev\)](#) [17:43, 18 March 2009](#) M.nelson (talk | contribs) . . (942 bytes) (+23) . . *(changed to "The term "visualization" or "visualisation"*

DIFF

svn diff: sshconsole.js

Diff style: Side-by-side Enable syntax coloring

Files Changed:

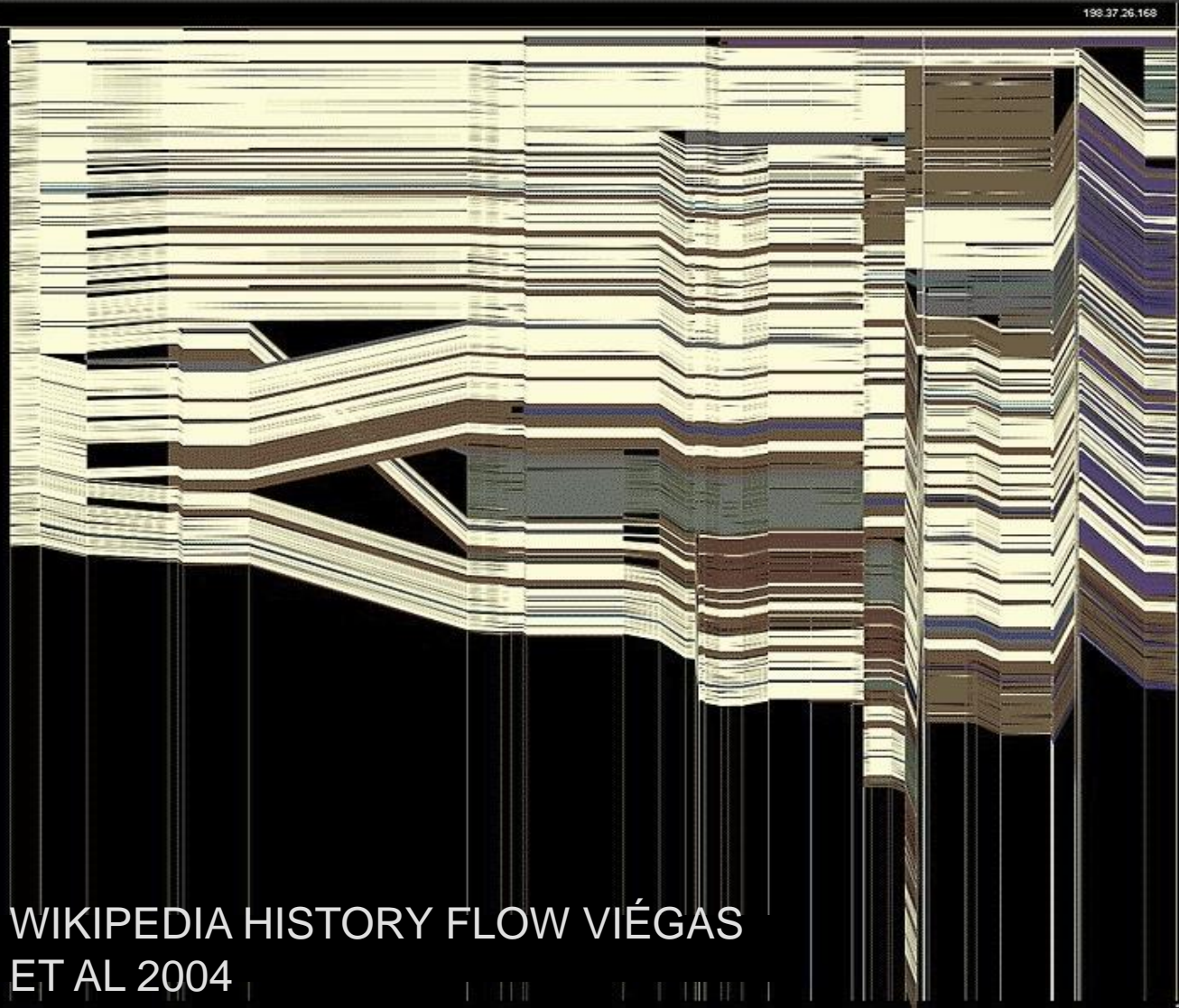
1. [sshconsole.js](#): 1 change [1]

/home/toddw/src/sshconsole-read-only/content/sshconsole.js

```
... 50 lines hidden [Expand]
51  _term = new VT100(80, 24, "term");
52  //_term.debug_ = 1;
53  _term.curs_set(true, true, _term_box_element);
54  _term.noecho();
55
56  // Replace the go_getch_ function with our own, this is called
57  // for every keypress that is passed through the terminal to the
58  // remote server. The character is already converted into the
59  // required VT100 character sequence(s).
60  VT100.go_getch_ = function() {
61    var vt = VT100.the_vt_;
62    if (vt === undefined) {
63      return;
64    }
65    var ch = vt.key_buf_.shift();
66    //dump("go_getch_:: ch: " + ch + "\n");
67    if (ch === undefined) {
68      return;
69    }
70    if (vt.echo_ && ch.length == 1) {
71      vt.addch(ch);
72    }
73    if (_ssh_channel) {
74      _ssh_channel.sendStdin(ch);
75    }
76  }
77
78  var serverTextbox = document.getElementById("sshconsole_server_textbox");
79  var connectionText;
80  if ('connectionText' in window.arguments[0]) {
81    connectionText = window.arguments[0].connectionText;
82  } else {
51  _term = new VT100(80, 24, "term");
52  //_term.debug_ = 1;
53  _term.curs_set(true, true, _term_box_element);
54  _term.noecho();
55
56  // Replace the go_getch_ function with our own, this is called
57  // for every keypress that is passed through the terminal to the
58  // remote server. The character is already converted into the
59  // required VT100 character sequence(s).
60  VT100.go_getch_ = function() {
61    var vt = VT100.the_vt_;
62    if (vt === somevalue) {
63      return;
64    }
65    var ch = vt.key_buf_.shift();
66    if (ch === undefined) {
67      return;
68    }
69    if (vt.echo_ && ch.length == 1) {
70      vt.addch(ch);
71      vt.refres();
72    }
73    if (_ssh_channel) {
74      _ssh_channel.sendStdin(ch);
75    }
76  }
77
78  var serverTextbox = document.getElementById("sshconsole_server_textbox");
79  var connectionText;
80  if ('connectionText' in window.arguments[0]) {
81    connectionText = window.arguments[0].connectionText;
82  } else {
... 174 lines hidden [Expand]
```

authors posts

- Zundark 1
- The Cunctator 1
- The Epopt 1
- Conversion script 1
- Rik 1
- Freob 1
- B4hand 1
- KamikazeArchon 1
- Stephen Gilbert 1
- Sirubenstein 8
- Mimccorn 5
- Ista 1
- Derek Ross 1
- Dante Alighieri 2
- Maveric143 3
- Jazzbug 2
- Jadri 8
- Theanthrope 1
- Wiesley 2
- Dreamword 1
- Steverbjo 4
- Camenbert 1
- Hephaestos 2
- Zoo 1
- MyRedDice 1
- G-Man 2
- Ringtarde 1
- Montbreaks 1
- Zee 1



Abortion

(Revision as of 22:56 4 Jun 2003)

"**Abortion**," in its most commonly used sense, refers to the deliberate early termination of pregnancy, resulting in the death of the embryo or fetus. [1] Medically, the term also refers to the early termination of a pregnancy by natural causes ("spontaneous abortion" or miscarriage, which ends 1 in 5 of all pregnancies, usually within the first 13 weeks) or to the cessation of normal growth of a body part or organ. What follows is a discussion of the issues related to deliberate or "induced" abortion.

Methods

Depending on the stage of pregnancy an abortion is performed by a number of different methods. For the earliest terminations (before nine weeks or so) a chemical abortion is the usual method, the drug **mifepristone** is usually the only legal method although research has uncovered similar effects from **methotrexate** and **misoprostol**. Concurrent with chemical abortion and extending up until around the fifteenth week **suction-aspiration** or **vacuum abortion** is the most common approach, replacing the more risky **dilation and curettage** (D & C). From the fifteenth week up until around the eighteenth week a surgical **dilation and evacuation** (D & E) is used.

As the fetus size increases other techniques must be used to secure abortion in the third trimester, premature expulsion of the fetus can be induced with **prostaglandin**, this can be coupled with injecting the amniotic fluid with saline or urea solution. Very late abortions can be brought about by the controversial **intact dilation and extraction** (D & X) or a **hysterotomy abortion**, similar to a **caesarian section**.

The controversy

The morality and legality of abortion is a large and important topic in **applied ethics** and is also discussed by **legal scholars** and **religious people**. Important facts about abortion are also researched by **sociologists** and **historians**.

Abortion has been common in most societies, although it has often been opposed by some institutionalized religions and governments. In **20th century politics in the United States and Europe**, abortion became commonly accepted by the end of the 20th century. Additionally, abortion is legal and accepted in **China**, **India** and other populous countries. The **Catholic Church** remains opposed to the procedure, however, and in other countries, notably the **United States** and the (predominantly Catholic) **Republic of Ireland**, the controversy is still extremely active, to the extent that even the names of the respective positions are subject to heated debate. While those on both sides of the argument are generally peaceful, if heated, in their advocacy of their positions, the debate is sometimes characterized by violence. Though true of both sides, this is more marked on the side of those opposed to abortion, because of what they see as the gravity and urgency of their views.

The central question

The central question in the abortion debate is a clash of presumed or perceived rights. On the one hand, is a fetus (sometimes called the "unborn" by pro-life/anti-abortion advocates) a human being with a right to life, and if so, at what point in the

WIKIPEDIA HISTORY FLOW VIÉGAS ET AL 2004

ANIMATED TRACES

fathom.info/traces

ON THE ORIGIN OF SPECIES *The Preservation of Favoured Traces*

I II III IV V VI VII VIII IX

head, not known to be electrical, but which appears to be the real homologue of the electric battery in the Torpedo. It is generally admitted that there exists between these organs and ordinary muscle a close analogy, in intimate

BEN FRY



Reset

Pause

Slow

Fast

I

II

III

IV

V

VI

VII

VIII

IX

X

XI

XII

XIII

XIV

■ First Edition (1859)

■ Second Edition (1860)

■ Third Edition (1861)

■ Fourth Edition (1866)

■ Fifth Edition (1869)

■ Sixth Edition (1872)

DIFFAMATION

Using Text Animated Transitions to support Navigation in Document Histories



Fanny
Chevalier



Pierre
Dragicevic



Anastasia
Bezerianos



Jean-Daniel
Fekete

VISUALIZING DOCUMENT COLLECTIONS

Analysts: GOP may regret gridlock over Scalia replacement

Update: Uber driver arrested in Michigan rampage that killed 6

Boris Johnson backs EU exit: London mayor confirms support for Brexit

'A multifaceted catastrophe': Turkey has 'so alienated everyone

Blasts rock Syrian city of Homs, killing at least 32

Palestinians struggle to define those who attack Israelis

Canada, USA renew rivalry in CONCACAF final



Sportsnet's James Sharman met with coach John Herdman and members of the Canadian women's soccer team, who are looking to beat the USA in Sunday's CONCACAF final. headshot Gavin Day February 20, 2016, 8:08 PM. headshot Gavin Day February

Feb 20 17:47 | 587 related articles | Sportsnet.ca

US rejected North Korea peace talks offer before last nuclear test

Malaysia, south-east Asia nations wamed of terror attacks

Samsung, LG unveil new devices in bid for smartphone recovery

Raceline Radio Program Guide: February 21, 2016

Canada, USA renew rivalry in CONCACAF final

'Deadpool' dominates again with \$55 million in 2nd week

Judge blocks attempt to halt deposition of Bill Cosby's wife

Taylor Swift donates \$250K to help Kesha's legal battle

Highlights from the USC report on entertainment diversity

Robbie Williams' ACTA

Chan wins Four Continents figure-skating championship

Years later, ex-Raptor Vince Carter's still soaring

SPRING TRAINING Blue Jays' focus at 2016 camp is on 2017

Scientists at Brock studying Zika to see if Canadian mosquitoes can spread the virus

How Syrian refugees arriving in Canada became 'extras' in their own stories

One dead, another injured in avalanche near Golden

LG Unveils the LG G5, Its First Modular Smartphone [Video]

LG G5 vs LG V10: first look

EPA asks Volkswagen to make electric cars in the US

Lenovo Open Firmware, the Open BIOS for IBM Tablets

Truex comes up a few inches short in closest Daytona 500

Canadian women earn historic 19-10 rugby victory over New Zealand

Miller puts an end to Canucks' losing streak

Leafs get set for a busy draft with Matthias trade

La Luche staff, students return to school this week

Cherry's arguments of fault still to put spotlight on the why and how

DOCUMENT CARDS

SMALL MULTIPLES FOR DOCUMENTS

4 Cerebral: Visualizing Multiple Experimental Conditions on a Graph with Biological Context

systems biologist context interaction graph graph model dataset figure

edge

tool

cell

gene

layout algorithm

process node cerebral

Aaron Barsky, Tamara Munzner, Jennifer Gurdy, and Robert Kincaid

2 Multi-Focused Geospatial Analysis Using Probes

probe interface

participant

type

window

region-of-interest local region

figure scale

data

application

Thomas Rutkiewicz, Wenwen Dou, Zachary Wartell, William Ribarsky, and Remco Chang

2 Stacked Graphs: Geometry & Aesthetics

question visualization paper

type author color

comment

york time

algorithm

order

namevoyager graphic time sery system

legibility design issue layout method

layer

trend

Lee Byron and Martin Wattenberg

3 Vispedia : Interactive Visual Exploration of Wikipedia Data via Search-Based Integration

Bryan Chan, Leslie Wu, Justin Talbot, Mike Cammarano, and Pat Hanrahan

4 Geometry-Based Edge Clustering for Graph Visualization

edge bundle technique polyline segment

large graph

road map control mesh straight line

mesh edge pattern transfer function

color and opacity enhancement

node position control point graph layout

result method visual cluster

general graph primary direction

user

Weiwei Cui, Hong Zhou, Student, Huamin Qu, Pak Chung Wong, and Xiaoming Li

5 VisGets: Coordinated Visualizations for Web-based Information Exploration and Discovery

map

rss feed

participant

temporal information item

data

information space

query parameter exploration set

visget

description

Marian Dirk, Sheelagh Caperdale, Christopher Collins, and Carey Williamson

6 Who Votes For What? A Visual Query Language for Opinion Data

user study

report attribute paper

sample population entity

result

sector opinion poll state street

typical data set

user interface

visual query language

visualization

design

poll data participant ring position system data point

task

model

Jeffrey M. Drapes, and Richard F. Riesenfeld

7 Exploration of Networks Using Overview+Detail with Constraint-based Cooperative Layout

layout method

route

tool

edge rout

high quality layout primary graph large network

detailed view

uml class diagram display

layout technique cluster position structure focus node

focal node

user lod

placement constraint

level

part

system

model

Tim Dwyer, Kim Marriott, Falk Schreiber, Peter J. Stuckey, Michael Woodward and Michael Wybow

8 Rolling the Dice: Multidimensional Visual Exploration using Scatterplot Matrix Navigation

visual exploration

data dimension

query

prototype implementation

visual representation

cameras

digital camera data set

figure

overview

range

navigation

grand tour

system

scatterplot matrix

user

plane

operation method order

Niklas Elmqvist, Pierre Dragicevic, and Jean-Daniel Fekete

9 Interactive Visual Analysis of Set-Typed Data

bar block user

scatterplot

figure

feature

width

data item

dataset

data record set-typed data view

washing agent histogram

Wolfgang Freller, Kresimir Matković, Computer Society, and Helwig Hauser

10 Graphical Histories for Visualization: Supporting Analysis, Communication, and Evaluation

graphical history usage history item

rule

tableau

image

data field

display

approach

event history interface history tool

Jeffrey Heer, Jock D. Mackinlay, Chris Stolte, and Maneesh Agrawala

11 Improving the Readability of Clustered Social Networks using Node Duplication

representation success rate

social network time clonemode

analysis

visualization duplicate

community

noduplication

duplication link splitlink

participant

readability

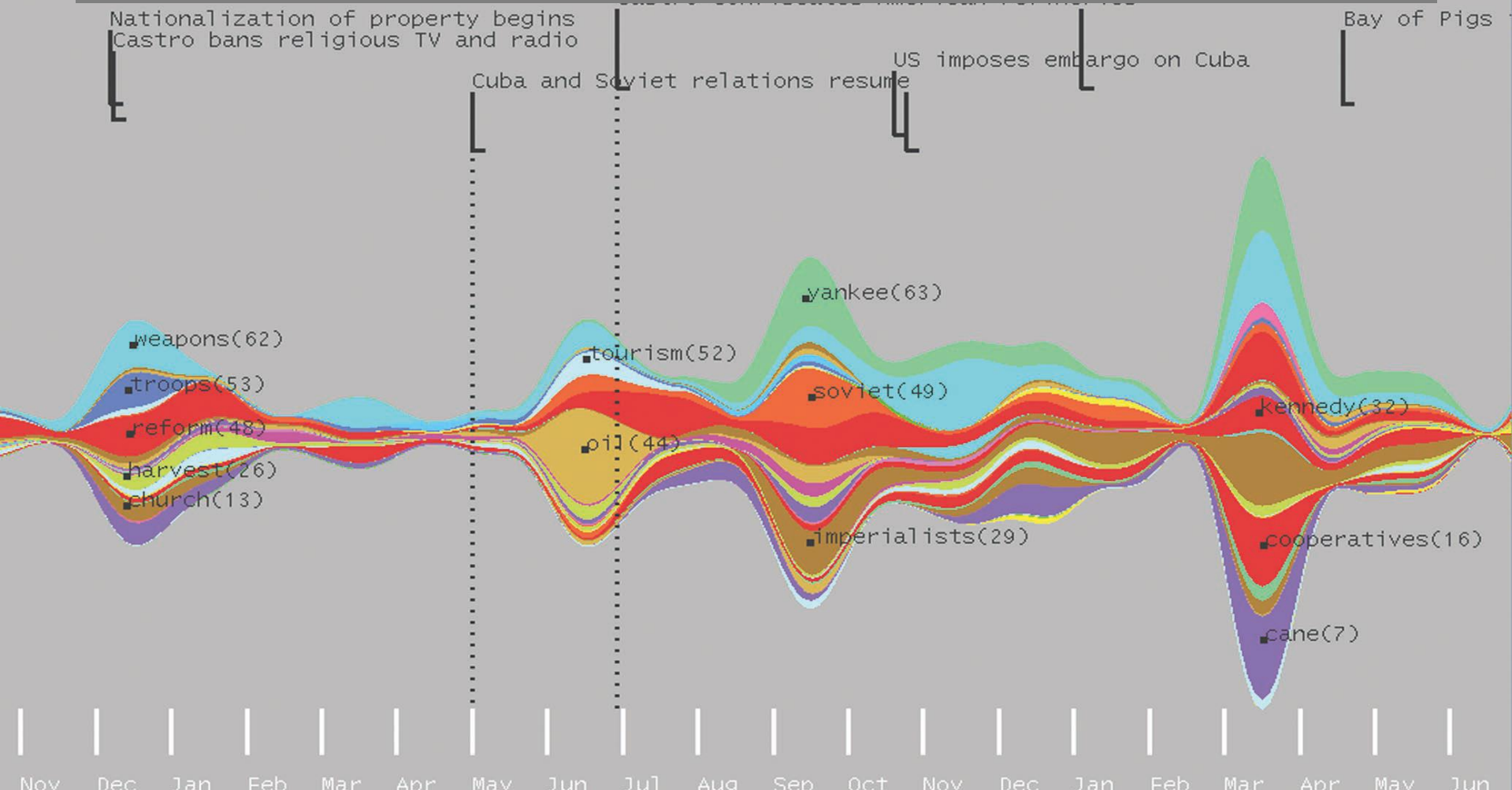
central actor clonelink

test

significant effect cluster

Nathalie Henry, Anastasia Bezerianos, and Jean-Daniel Fekete

THEMERIVER HAVRE ET AL 1999



SUPPORTING SEARCH

User Query
(Enter words for different topics on different lines.)

osteoporosis
prevention
research

Run Search New Query Quit

Search Limit: 50 100 250 500 1000
Number of Clusters: 3 4 5 8 10

Mode: Tile Bars

Cluster Titles Backup

The screenshot displays a search interface with a list of results. On the left, there are vertical bar charts (TileBars) for each result, showing the distribution of terms across different clusters. The results are as follows:

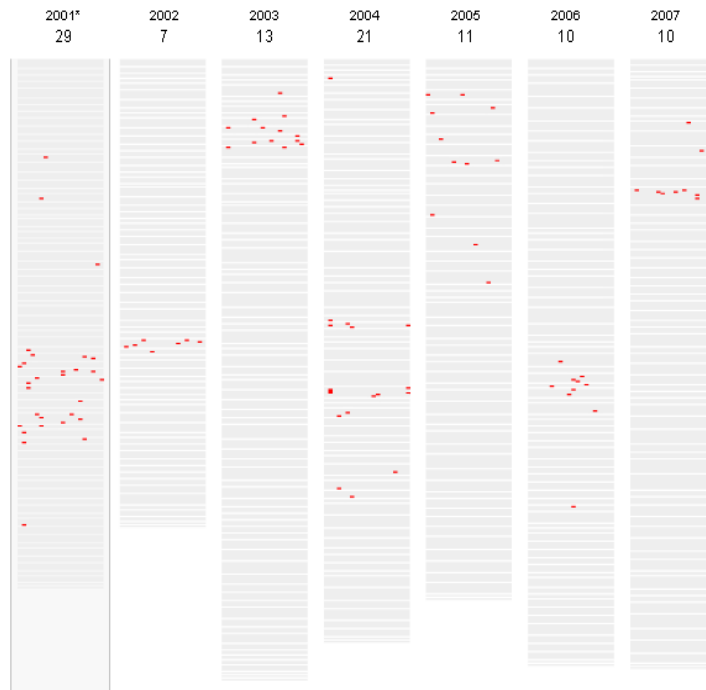
- FR88513-0157
- AP: Groups Seek \$1 Billion a Year for Aging Research
- SJMN: WOMEN'S HEALTH LEGISLATION PROPOSED CF
- AP: Older Athletes Run For Science
- FR: Committee Meetings
- FR: October Advisory Committees; Meetings
- FR88120-0046
- FR: Chronic Disease Burden and Prevention Models; Program
- AP: Survey Says Experts Split on Diversion of Funds for AIDS
- FR: Consolidated Delegations of Authority for Policy Developm
- SJMN: RESEARCH FOR BREAST CANCER IS STUCK IN P

TileBars Hearst 1999

The 2007 State of the Union Address

Over the years, President Bush's State of the Union address has averaged almost 5,000 words each, meaning the the President has delivered over 34,000 words. Some words appear frequently while others appear only sporadically. Use the tools below to analyze what Mr. Bush has said.

Use of the phrase "Tax" in past State of the Union Addresses



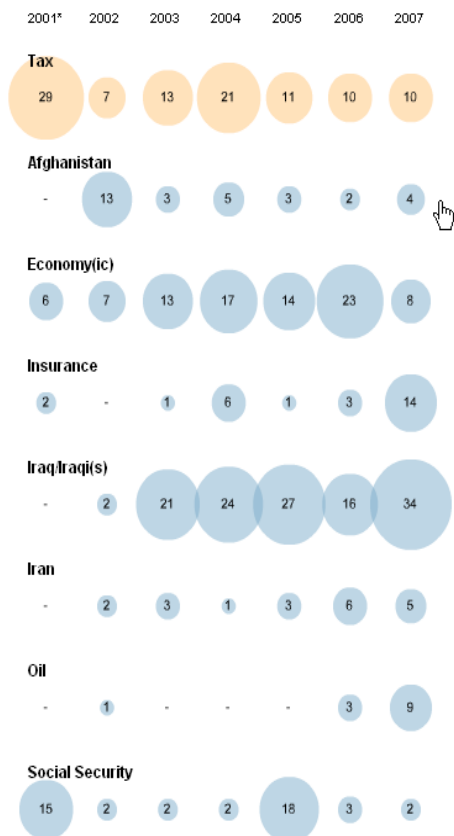
The word in context

I believe in local control of schools. We should not, and we will not, run public schools from Washington, D.C. Yet when the federal government spends **TAX** dollars, we must insist on results. Children should be tested on basic reading and math skills every year between grades three and eight. Measuring is the only way to know whether all our children are learning. And I want to know, because I refuse to leave any child behind in America.

-- 2001 (Paragraph 14 of 73)

[Next instance of 'Tax'](#)

Compared with other words



* As a newly elected president, Mr. Bush did not deliver a formal State of the Union address in 2001. His Feb. 27 speech to a joint session of Congress was analogous to the State of the Union, but without the title.

NAMED ENTITY RECOGNITION

IDENTIFY AND CLASSIFY NAMED ENTITIES IN TEXT:

JOHN SMITH IS A **PERSON**

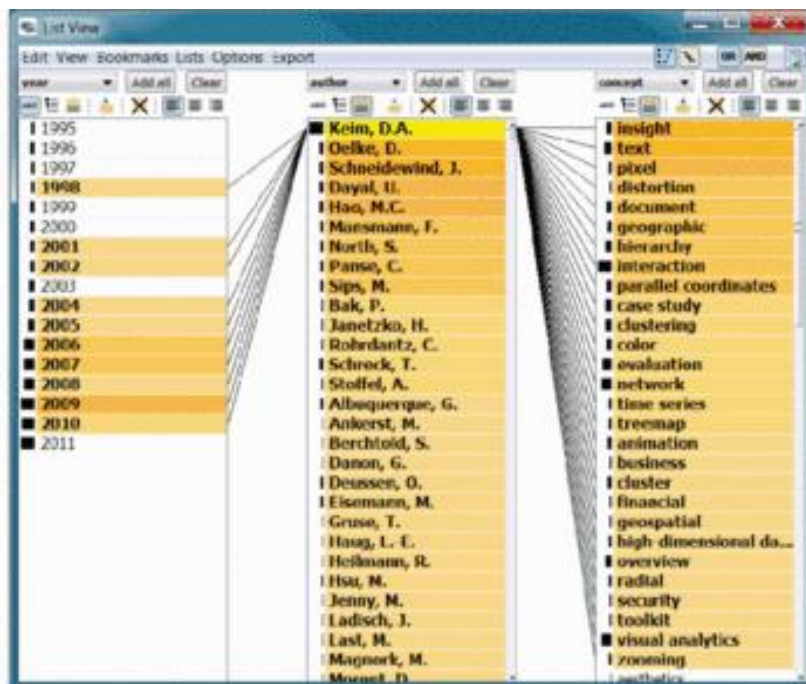
SOVIET UNION IS A **COUNTRY**

2500 UNIVERSITY DR IS AN **ADDRESS**


(555) 867-5309 IS A **PHONE NUMBER**

ENTITY RELATIONS: HOW DO THE ENTITIES RELATE?

DO THEY CO-OCCUR IN A DOCUMENT? IN A SENTENCE?



JIGSAW



CENDARI
COLLABORATIVE EUROPEAN DIGITAL
ARCHIVE INFRASTRUCTURE

[Home](#) [Browse](#) [About](#) [Issue Report](#) [Survey](#)

[anthi](#)

Resources New Save Import Help

My Projects:

- Green Cadres
- WW1
 - Notes (1)
 - Green Cadres Notes
 - Documents (144)
 - Entities (7)
 - Event (1)
 - Organization (0)
 - Person (3)
 - Publication (0)
 - Artifact (0)
 - Place (5)
 - Tag (3)

Note 5: Green Cadres Notes

Entities (12) Status (Open) Assigned Users

Green Cadres Notes

Note Description [Read Only] --- click here for Edit mode


In 1918, as privations and social unrest began to undermine the Austro-Hungarian war effort on the home front, a specific kind of revolt gripped the countryside in a number of regions of the empire. The so-called **Green Cadres** or **Green Brigades** were groups of armed deserters, supplemented by the local poor peasantry, who hid themselves in forested areas, staging raids on livestock and crops, attacking the local gendarmerie and military, and (in some instances) articulating social revolutionary programs. Reports on these irregular armed bands abounded in the final year of the year in many regions of both **Austria and Hungary** but they were concentrated in **Croatia-Slavonia** (current Croatia and **Serbia**) and southern **Moravia** (current Czech republic). The **Green Cadres** represented a specifically rural form of unrest—largely unhitched from **nationalist** and party political agendas—reflecting the widespread sense of apocalyptic collapse among the rural population of Austria-Hungary.

The historical research on the Green Cadres is scant and preponderantly concentrated on the region of **Croatia-Slavonia**, where the Cadres where most numerous and their actions most ambitious. Communist-era **Yugoslav** scholarship treated the Green Cadres as proto-Bolsheviks, overemphasizing the prevalence of **Leninist** ideas among them. Indeed, research has revealed that soldiers returning from Russian imprisonment in 1918 played leading roles in mass desertions, mutinies, and the propagation of social-revolutionist ideas. But scholars have not identified the specific mechanisms by which former POWs became Green Cadres or how the Russian experience was reinterpreted in rural Austro-Hungarian contexts. More importantly, a comparative study of the cadres in various regions is missing because of the challenges of finding, organizing, and interpreting sources that are now fragmented in various national archival research 'siloes'.


This project seeks to open up comparative vistas on the problem of the Green Cadres. Among the possible questions it seeks to answer are: 1. How did the far-flung groups identified as Green Cadres compare to each other in terms of actions and aims; 2. Why did the Cadres appear in the places that they did?; 3. What were the social, political, and cultural factors that facilitated the formation or concentration of Cadres in specific locales?; 4. What kind of **deserters** made up the **bulk of the Cadres**—deserters from the front, replacement regiments, or allotted leave after returning from **Russian internment**?; 5. What played a bigger role in the formation of Green Cadres: social revolutionary influences from Russian imprisonment or disillusionment with the war effort?

Visualizations

Most Common Person **FRAPET, Guillaume**




Most Common Place **Nantes** 128 docs




Most Recent **Date: 1711/1/29** 1711-1-29

Oldest **Date: 1669/6/5** 1669-6-5



Most Common Place **Nantes** 128 docs



CENDARI NOTE-TAKING ENVIRONMENT 2015

DOCUMENT SIMILARITY & CLUSTERING

COMPUTE SIMILARITY BETWEEN DOCUMENTS BASED ON THE WORDS THEY SHARE

- TF-IDF (TERM FREQUENCY-INVERSE DOCUMENT FREQUENCY) IS COMMON

TOPIC MODELING APPROACHES

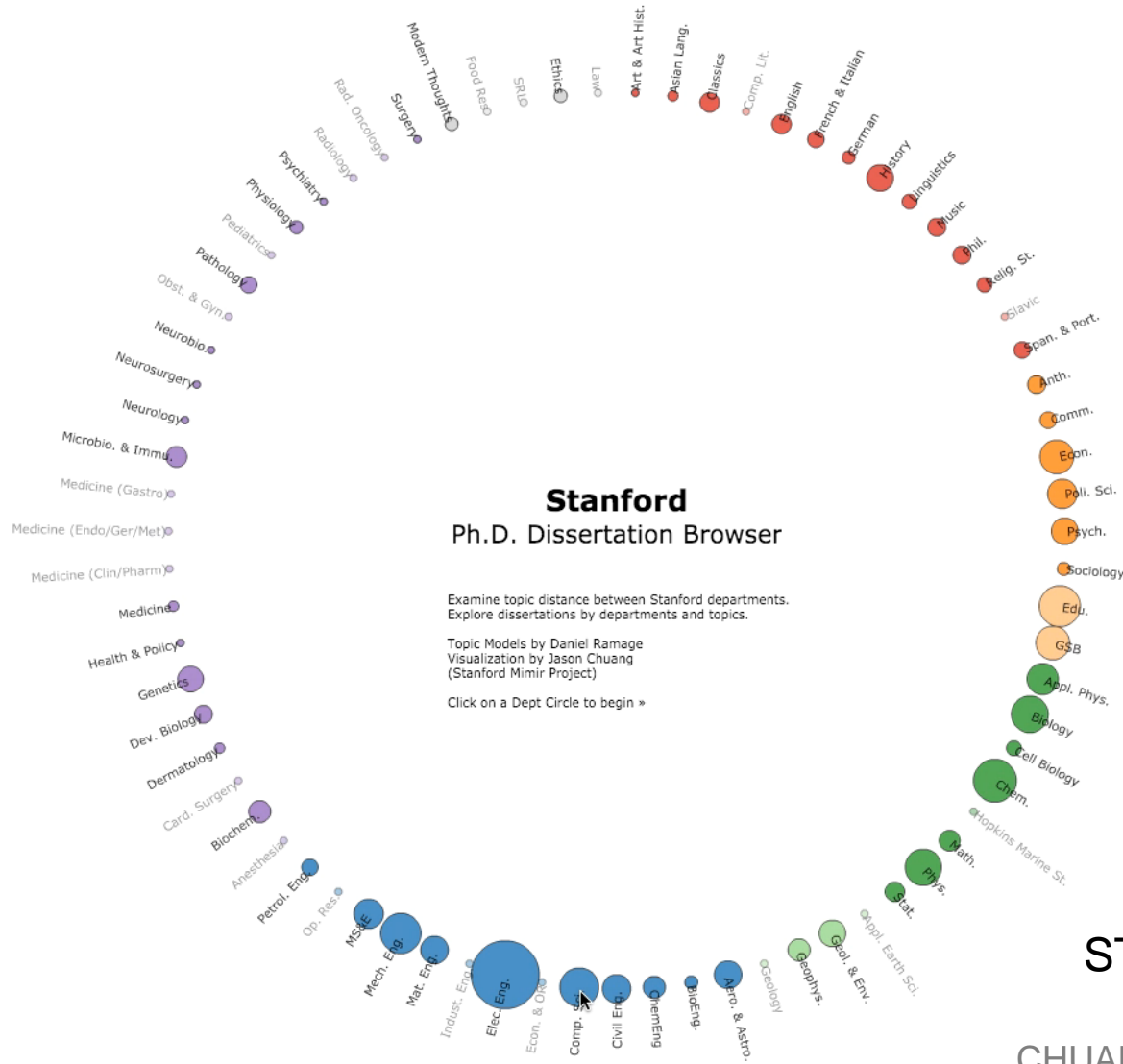
- ASSUME DOCUMENTS ARE A MIXTURE OF TOPICS
 - TOPICS ARE (ROUGHLY) A SET OF CO-OCCURRING TERMS
 - LATENT SEMANTIC ANALYSIS (LSA): REDUCE TERM MATRIX
-
- MANY, MANY APPROACHES EXIST

Stanford Ph.D. Dissertation Browser

Examine topic distance between Stanford departments.
Explore dissertations by departments and topics.

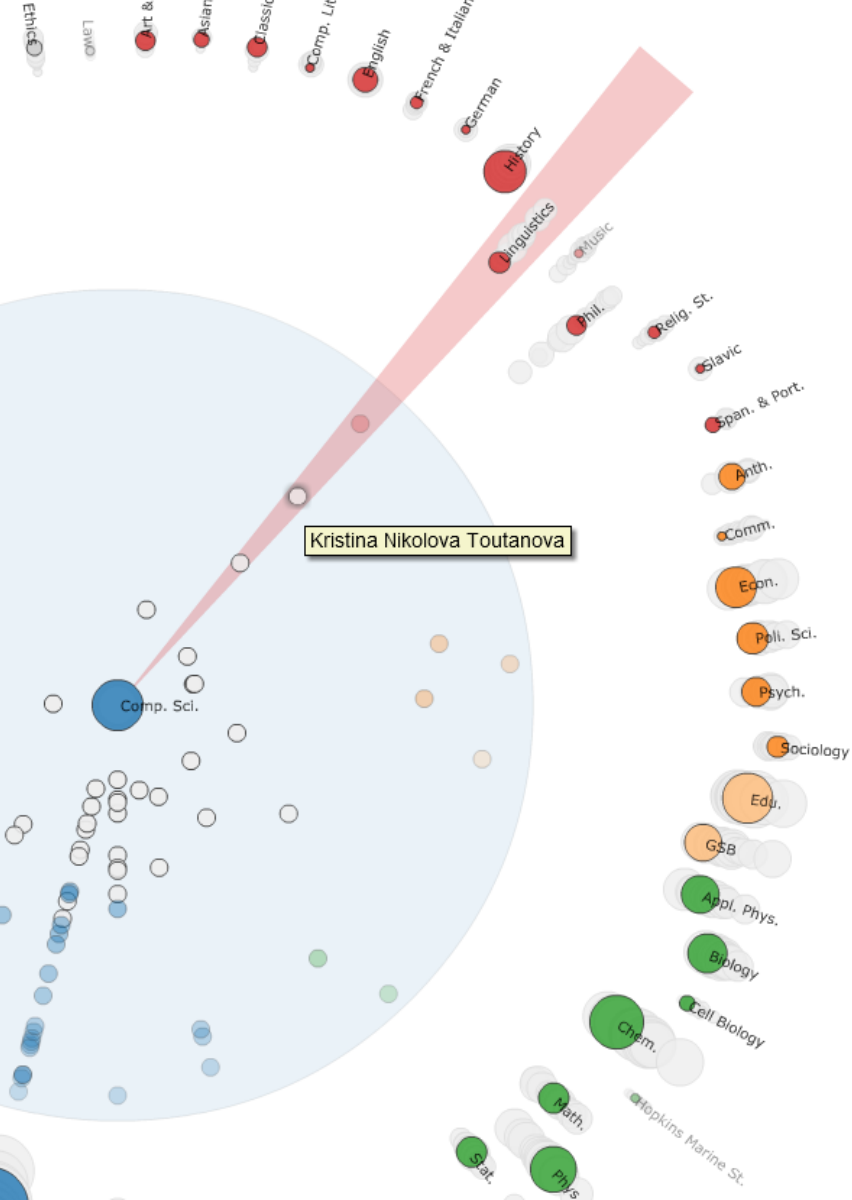
Topic Models by Daniel Ramage
Visualization by Jason Chuang
(Stanford Mimir Project)

Click on a Dept Circle to begin »



STANFORD DISSERTATION BROWSER

CHUANG, RAMAGE, MANNING & HEER
2012



Effective statistical models for syntactic and semantic disambiguation

Student: Kristina Nikolova Toutanova

Advisor: Christopher D. Manning

Computer Science (2005)

Keywords: Syntactic, Semantic, Tree kernels, Parsing

Abstract:

This thesis focuses on building effective statistical models for disambiguation of sophisticated syntactic and semantic natural language (NL) structures. We advance the state of the art in several domains by (i) choosing representations that encode domain knowledge more effectively and (ii) developing machine learning algorithms that deal with the specific properties of NL disambiguation tasks--sparsity of training data and large, structured spaces of hidden labels. For the task of syntactic disambiguation, we propose a novel representation of parse trees that connects the words of the sentence with the hidden syntactic structure in a direct way. Experimental evaluation on parse selection for a Head Driven Phrase Structure Grammar shows the new representation achieves superior performance compared to previous models. For the task of disambiguating the semantic role structure of verbs, we build a more accurate model, which captures the knowledge that the semantic frame of a verb is a joint structure with strong dependencies between arguments. We achieve this using a Conditional Random Field without Markov independence assumptions on the sequence of semantic role labels. To address the sparsity problem in machine learning for NL, we develop a method for incorporating many additional sources of information, using Markov chains in the space of words. The Markov chain framework makes it possible to combine multiple knowledge sources, to learn how much to trust each of them, and to chain inferences together. It achieves large gains in the task of disambiguating prepositional phrase attachments.

WARNING

OFTEN, TEXT VISUALIZATIONS DO NOT REPRESENT TEXT DIRECTLY, BUT THEY REPRESENT A MODEL
WORD COUNTS, WORD SEQUENCES, CLUSTERS, ETC.

ASK:

CAN YOU INTERPRET THE VISUALIZATION?

DOES THE MODEL ACCURATELY REPRESENT THE ORIGINAL TEXT?

LESSONS FOR TEXT VISUALIZATION

SHOW SOURCE TEXT (OR PROVIDE ACCESS TO IT)

WHERE POSSIBLE, USE VISUALIZATION AS INDEX INTO DOCUMENTS

GROUP DOCUMENTS IN MEANINGFUL WAYS

WILL VIEWERS UNDERSTAND THE CLUSTERS?

WHERE POSSIBLE USE TEXT TO REPRESENT TEXT

HUNDREDS OF TOOLS & TECHNIQUES FOR TEXT AT

<http://textvis.lnu.se/>

The screenshot shows a web browser window with the URL `textvis.lnu.se`. The page title is "Text Visualization Browser" and the subtitle is "A Visual Survey of Text Visualization Techniques". It is provided by the ISOVIS group. The page features a navigation menu with "About", "Add entry", and "Other surveys".

On the left side, there is a sidebar with the following controls:

- Techniques displayed:** 272
- Search:** A search input field with a clear button (X).
- Time filter:** A range selector from 1976 to 2016.
- Analytic Tasks:** A grid of icons representing different tasks: Sum, Alert, Heart, Like, Bell, Share, Text, Refresh, and Edit.

The main content area displays a grid of 48 text visualization techniques. A tooltip is visible over one of the techniques, labeled "Visual Plagiarism Analysis Tool (2015)".

At the bottom right, there is a button labeled "Display a menu".

QUESTIONS?

ACKNOWLEDGEMENTS

Slides in were inspired, adapted, taken from slides by

- Christopher Collins (University of Ontario Institute of Technology)
- Wesley Willett (University of Calgary)