Semantic Web Visualization

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DIG Seminar
August 18th 2009

Outline

- Why is Semantic Web visualization hard?
- What are the methods that have been used for viewing Semantic Web data?
- What lessons have been learned so far?
- Discussion: How can we use those lessons to make a better browsing experience?

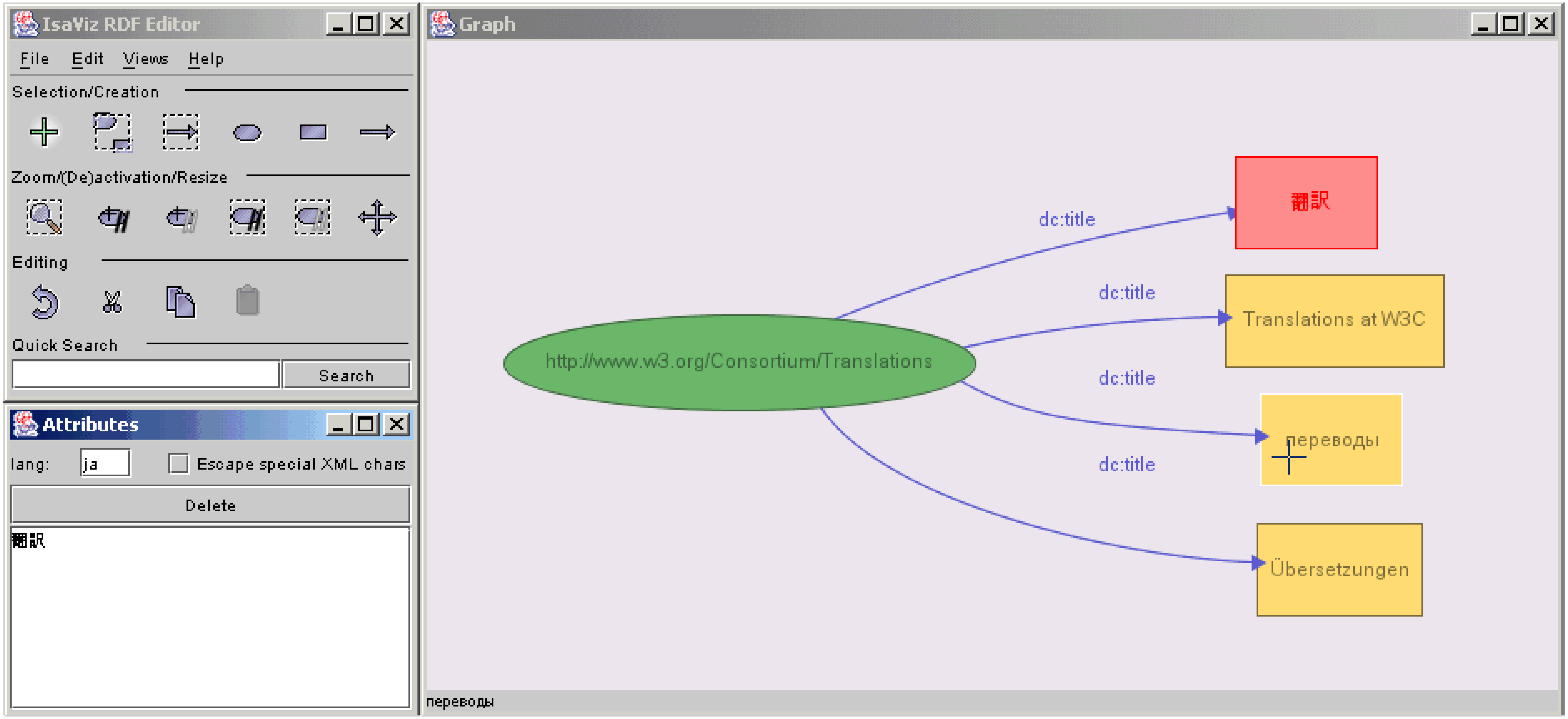
Issues viewing the Semantic Web

- Irrelevant data
  - Family photographs when you want a business card
- Redundant data
  - Given Name, Family Name, Name
- Display and Layout
  - No layout information
  - Bad labels or even no labels

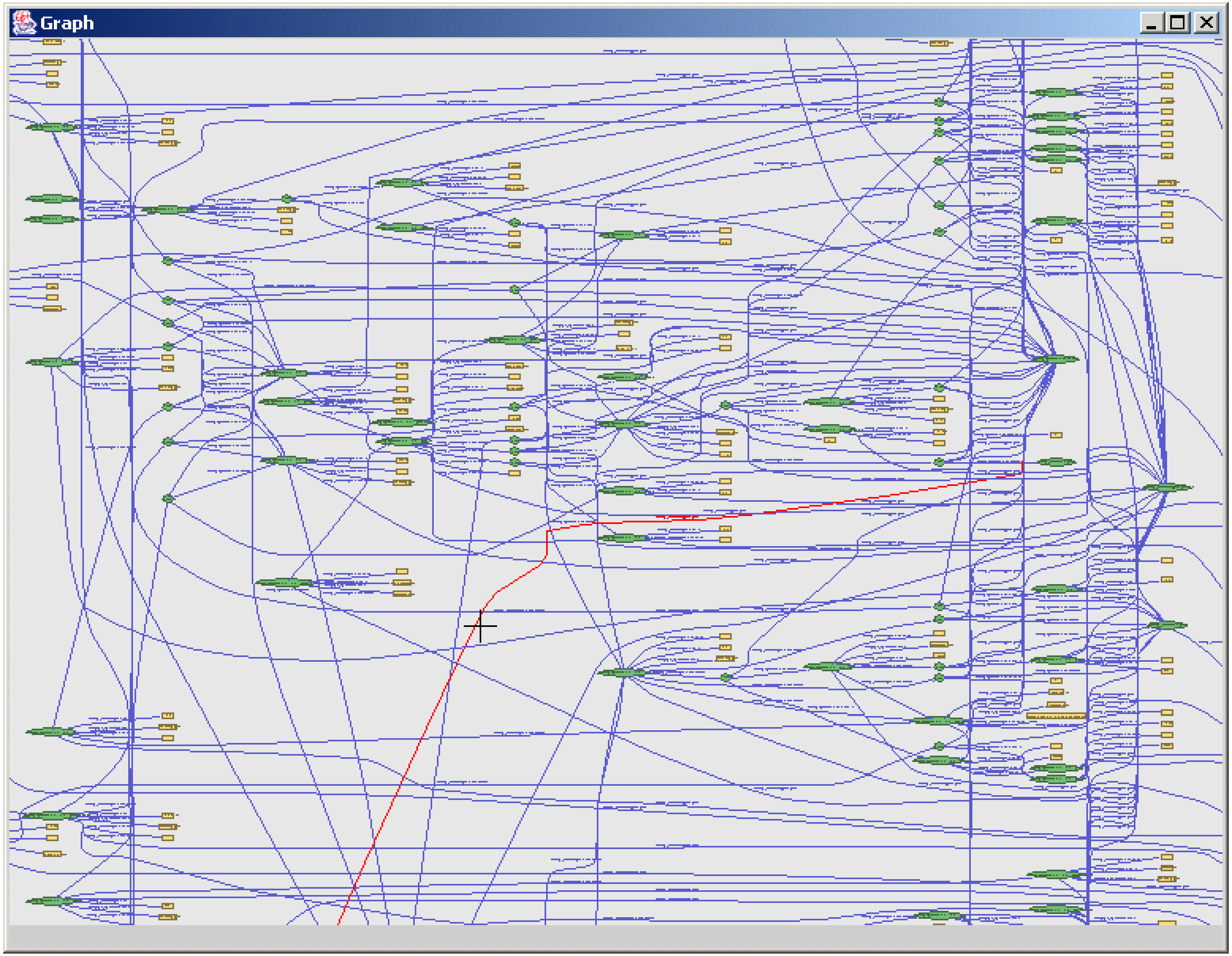
Circles And Arrows

- True graph representation
- Interesting with small datasets with relatively few branches.
- Very poor for most Semantic Web-scale datasets.

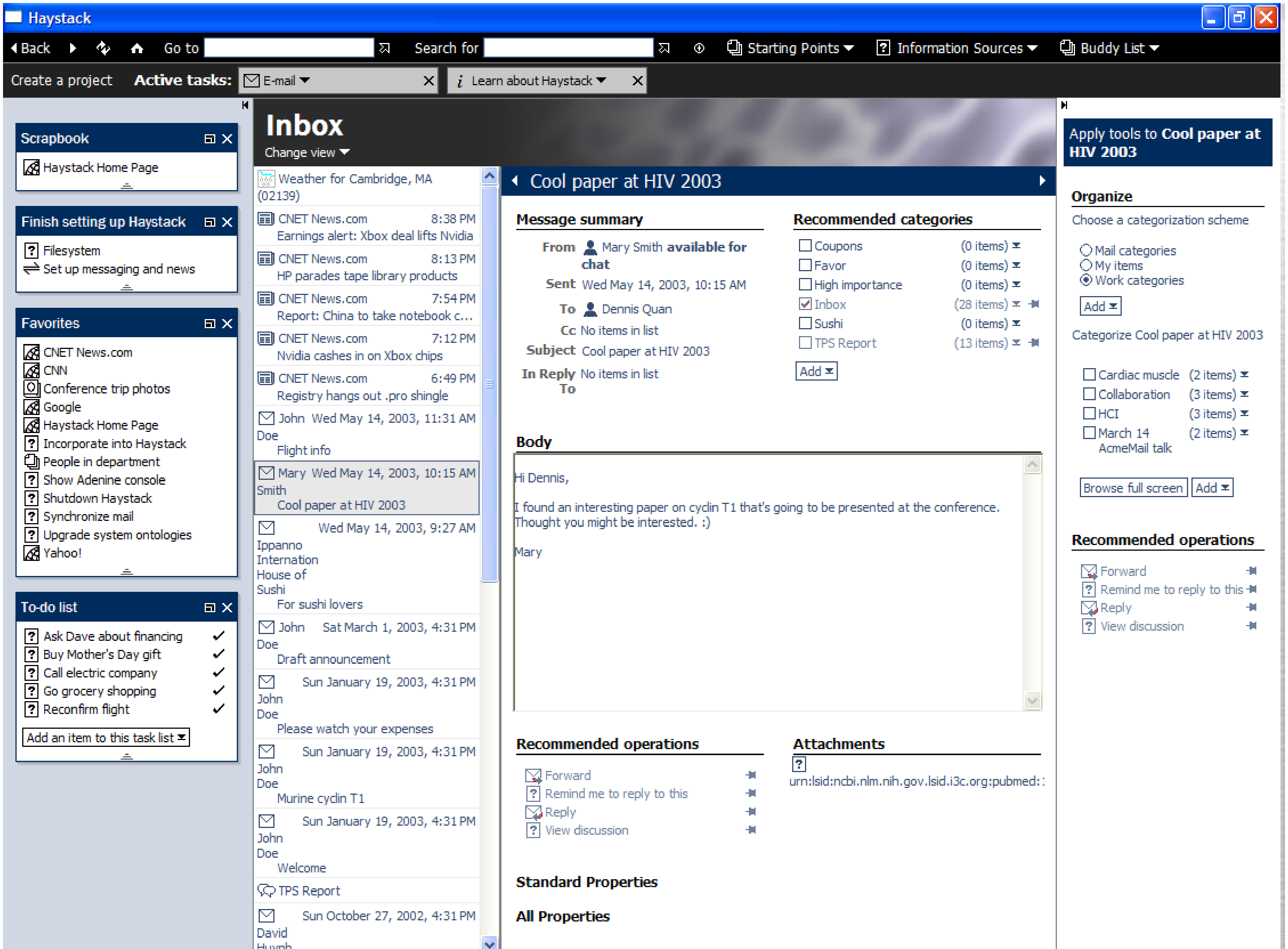
Isaviz


IsaViz RDF Editor
File Edit Views Help
Selection/Creation
Zoom/(De)activation/Resize
Editing
Quick Search
Search
Attributes
lang: ja
Escape special XML chars
Delete
翻訳
Graph
http://www.w3.org/Consortium/Translations
dc:title
dc:title
dc:title
dc:title
翻訳
Translations at W3C
переводы
Übersetzungen
переводы

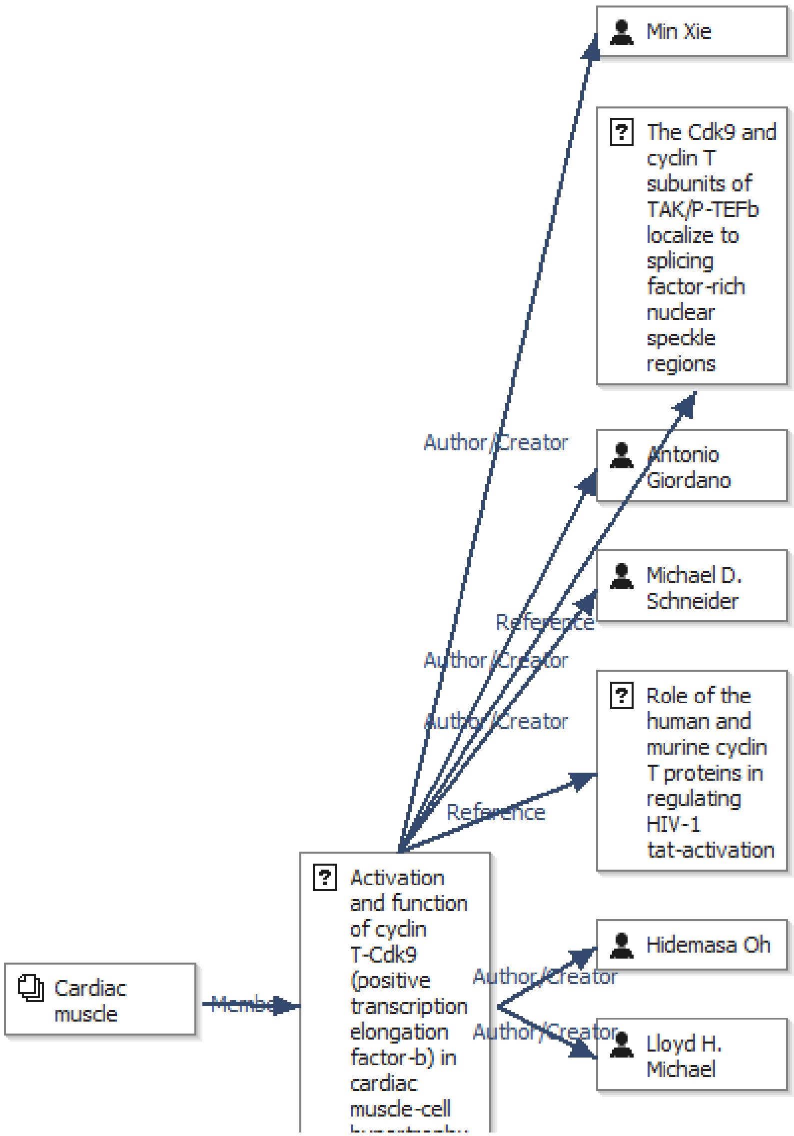
Isaviz



Haystack


Haystack
Back
Go to
Search for
Starting Points
Information Sources
Buddy List
Create a project
Active tasks:
E-mail
Learn about Haystack
Scrapbook
Haystack Home Page
Finish setting up Haystack
Filesystem
Set up messaging and news
Favorites
CNET News.com
CNN
Conference trip photos
Google
Haystack Home Page
Incorporate into Haystack
People in department
Show Adenine console
Shutdown Haystack
Synchronize mail
Upgrade system ontologies
Yahoo!
To-do list
Ask Dave about financing
Buy Mother's Day gift
Call electric company
Go grocery shopping
Reconfirm flight
Add an item to this task list
Inbox
Change view
Weather for Cambridge, MA (02139)
CNET News.com 8:38 PM
Earnings alert: Xbox deal lifts Nvidia
CNET News.com 8:13 PM
HP parades tape library products
CNET News.com 7:54 PM
Report: China to take notebook c...
CNET News.com 7:12 PM
Nvidia cashes in on Xbox chips
CNET News.com 6:49 PM
Registry hangs out .pro shingle
John Doe Wed May 14, 2003, 11:31 AM
Flight info
Mary Smith Wed May 14, 2003, 10:15 AM
Cool paper at HIV 2003
Ippanno Internation House of Sushi Wed May 14, 2003, 9:27 AM
For sushi lovers
John Doe Sat March 1, 2003, 4:31 PM
Draft announcement
John Doe Sun January 19, 2003, 4:31 PM
Please watch your expenses
John Doe Sun January 19, 2003, 4:31 PM
Murine cyclin T1
John Doe Sun January 19, 2003, 4:31 PM
Welcome
TPS Report
David Huynh Sun October 27, 2002, 4:31 PM
Cool paper at HIV 2003
Message summary
From Mary Smith available for chat
Sent Wed May 14, 2003, 10:15 AM
To Dennis Quan
Cc No items in list
Subject Cool paper at HIV 2003
In Reply To No items in list
Recommended categories
Coupons (0 items)
Favor (0 items)
High importance (0 items)
Inbox (28 items)
Sushi (0 items)
TPS Report (13 items)
Add
Body
Hi Dennis,
I found an interesting paper on cyclin T1 that's going to be presented at the conference. Thought you might be interested. :)
Mary
Recommended operations
Forward
Remind me to reply to this
Reply
View discussion
Attachments
urn:lsid:ncbi.nlm.nih.gov.lsid.i3c.org:pubmed:
Standard Properties
All Properties
Apply tools to Cool paper at HIV 2003
Organize
Choose a categorization scheme
Mail categories
My items
Work categories
Add
Categorize Cool paper at HIV 2003
Cardiac muscle (2 items)
Collaboration (3 items)
HCI (3 items)
March 14 AcmeMail talk (2 items)
Browse full screen
Add
Recommended operations
Forward
Remind me to reply to this
Reply
View discussion

Haystack



Min Xie
The Cdk9 and cyclin T subunits of TAK/P-TEFb localize to splicing factor-rich nuclear speckle regions
Author/Creator
Antonio Giordano
Michael D. Schneider
Reference
Author/Creator
Author/Creator
Role of the human and murine cyclin T proteins in regulating HIV-1 tat-activation
Reference
Activation and function of cyclin T-Cdk9 (positive transcription elongation factor-b) in cardiac muscle-cell
Hidemasa Oh
Author/Creator
Author/Creator
Lloyd H. Michael
Cardiac muscle

Data Tables and Mashups

- Well-suited for displaying property-value pairs
  - Less cluttered than circles and arrows
- Allows users to navigate the graph
- At times, data table is almost too generic
  - Try to solve with domain-specific mashups

Tabulator

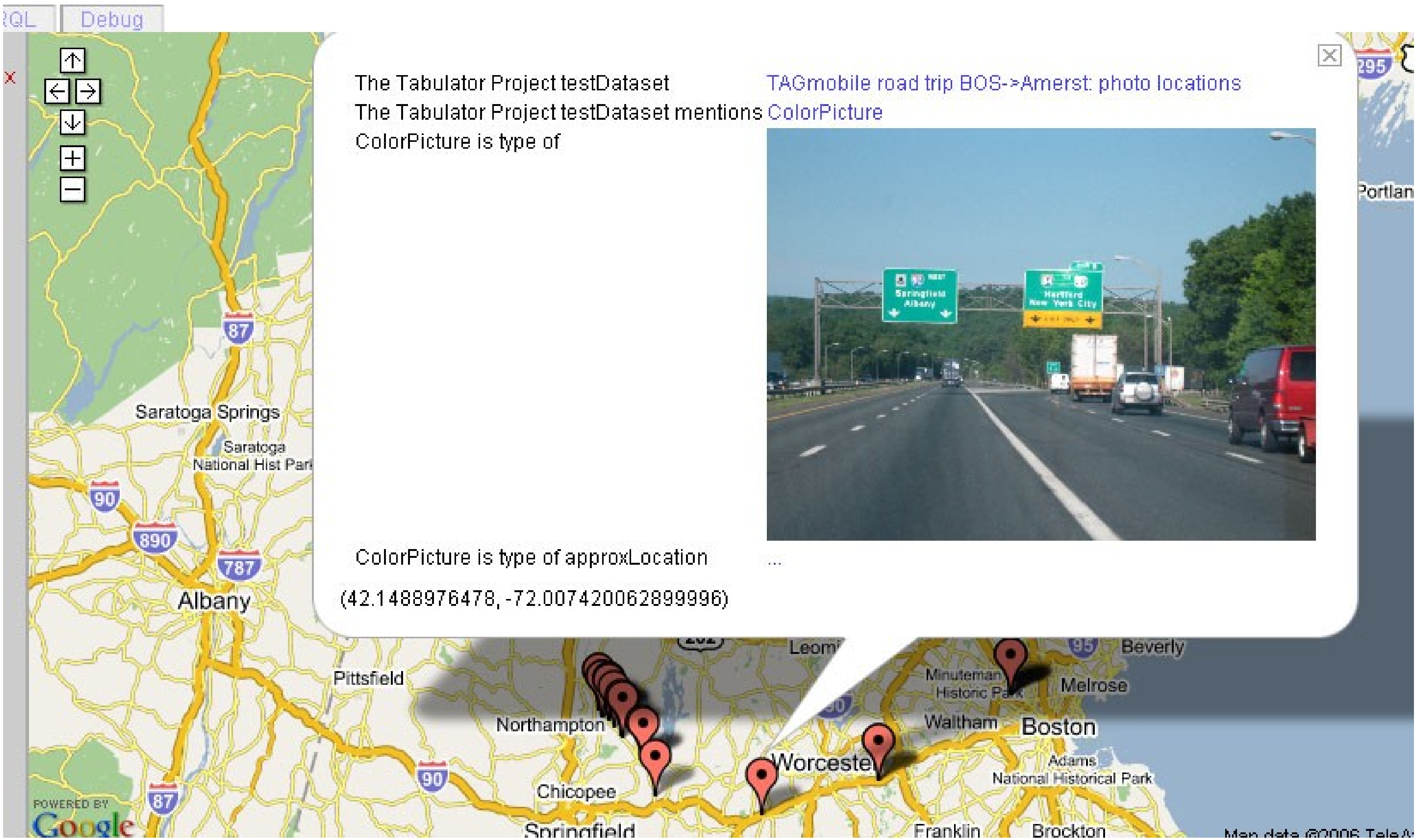
▼Decentralized Information Group

type	▶ Organization
label	DIG
homepage	▶ http://dig.csail.mit.edu/
logo	DIG ▶
member	▶ Fuming
	▶ Ralph

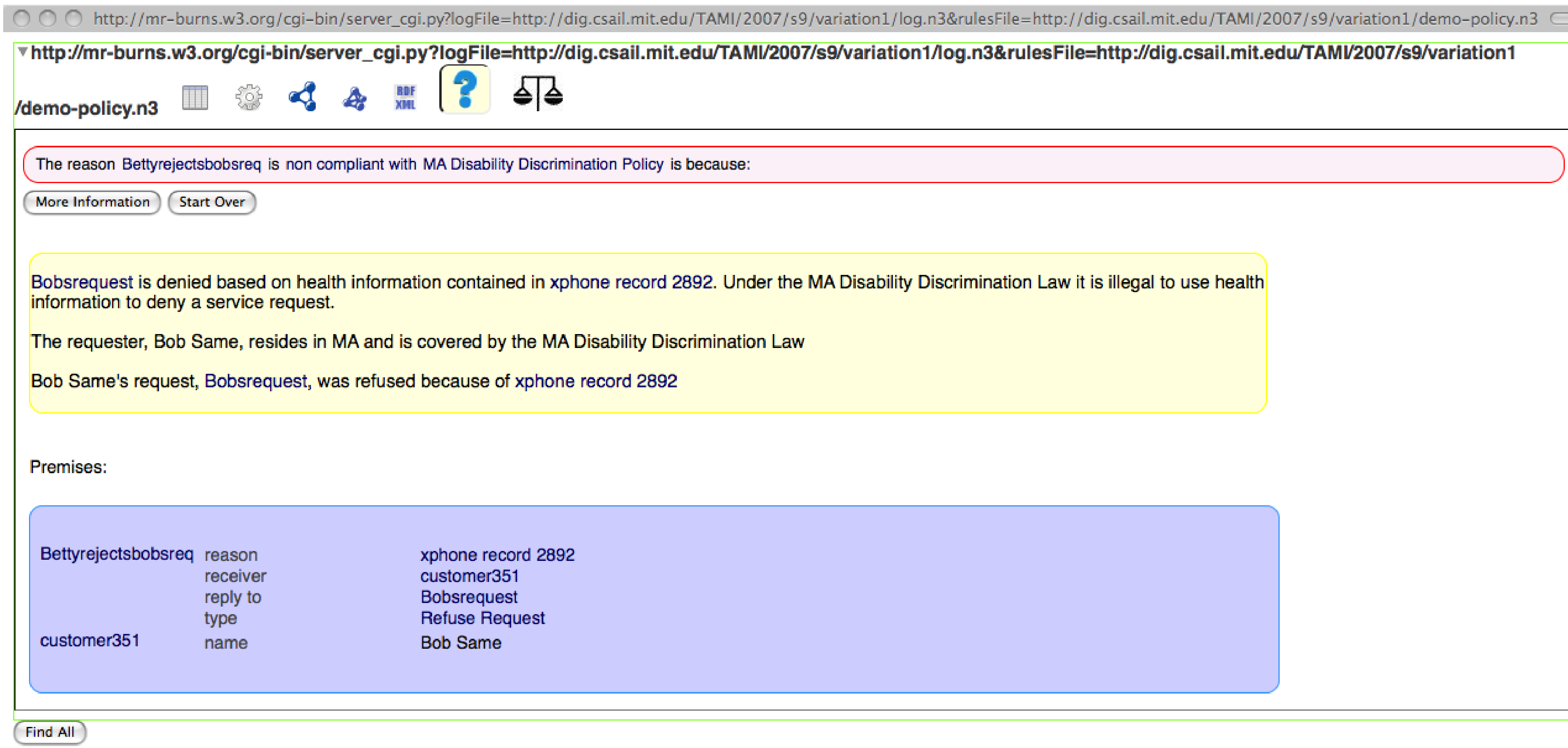
▼Gerald Jay Sussman

type	▶ Person
label	Gerry
depiction	

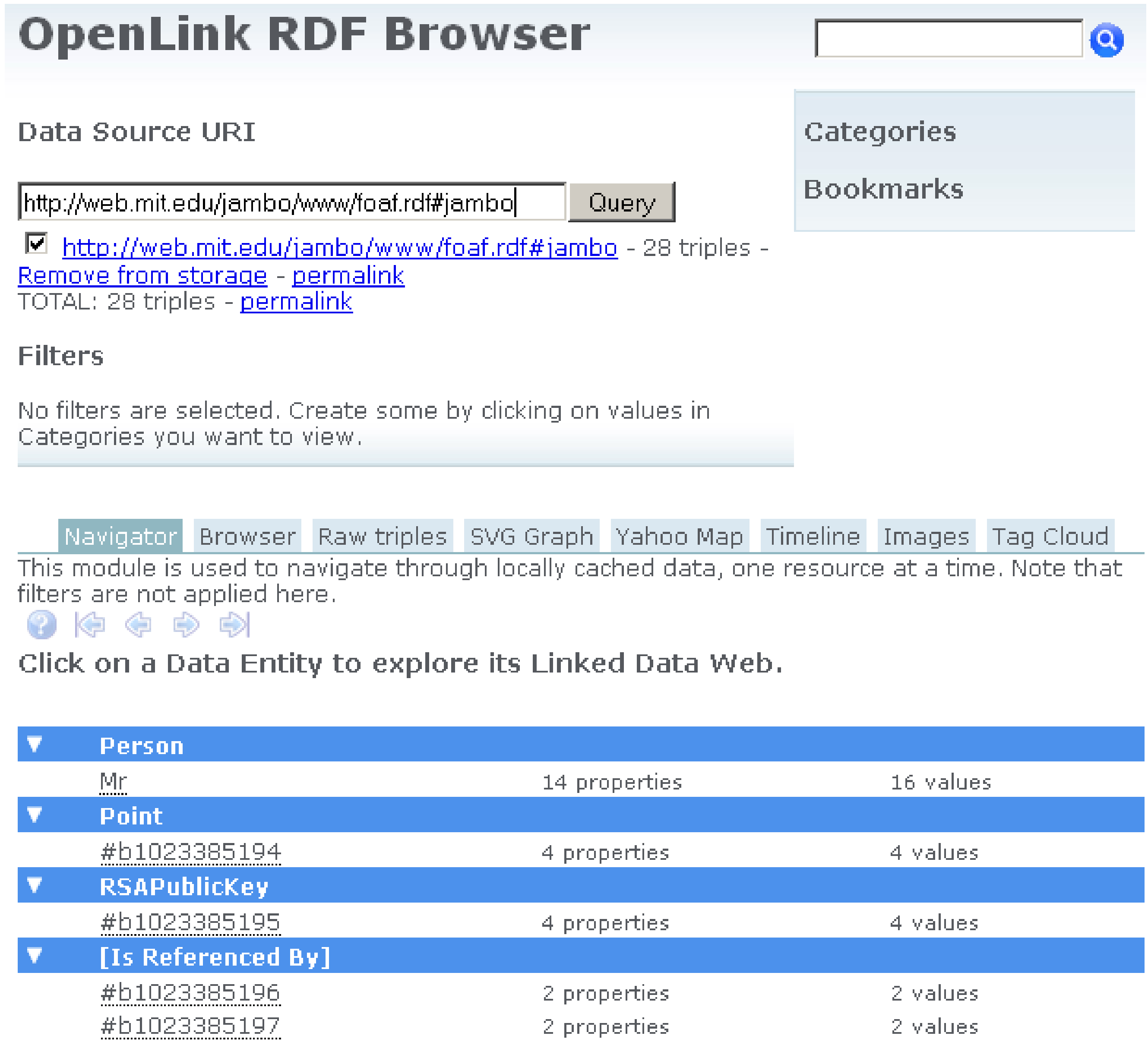
Tabulator


Debug
The Tabulator Project testDataset
TAGmobile road trip BOS->Amerst: photo locations
The Tabulator Project testDataset mentions
ColorPicture
ColorPicture is type of
ColorPicture is type of approxLocation
...
(42.1488976478, -72.0074200628999996)
Saratoga Springs
Saratoga National Hist Park
Albany
Pittsfield
Northampton
Chicopee
Springfield
Worcester
Waltham
Boston
Melrose
Beverly
Minuteman Historic Park
Adams National Historical Park
Franklin
Brockton
POWERED BY Google

Tabulator


http://mr-burns.w3.org/cgi-bin/server_cgi.py?logFile=http://dig.csail.mit.edu/TAMI/2007/s9/variation1/log.n3&rulesFile=http://dig.csail.mit.edu/TAMI/2007/s9/variation1/demo-policy.n3
http://mr-burns.w3.org/cgi-bin/server_cgi.py?logFile=http://dig.csail.mit.edu/TAMI/2007/s9/variation1/log.n3&rulesFile=http://dig.csail.mit.edu/TAMI/2007/s9/variation1/demo-policy.n3
RDF XML
The reason Bettyrejectsbobsreq is non compliant with MA Disability Discrimination Policy is because:
More Information
Start Over
Bobsrequest is denied based on health information contained in xphone record 2892. Under the MA Disability Discrimination Law it is illegal to use health information to deny a service request.
The requester, Bob Same, resides in MA and is covered by the MA Disability Discrimination Law
Bob Same's request, Bobsrequest, was refused because of xphone record 2892
Premises:
Bettyrejectsbobsreq reason xphone record 2892
receiver customer351
reply to Bobsrequest
type Refuse Request
customer351 name Bob Same
Find All

OpenLink RDF Browser



Sig.ma


SIG.MA
SEMANTIC INFORMATION MASHUP
Help
About
Forum
Tim Berners Lee
Add More Info
Start New
Order
Permalink
Options
Tim Berners-Lee
picture:
given name: Timothy [3,6]
Tim [8,13]
family name: Berners-Lee [3,6,8,13]
comment: with Tim Berners-Lee on Oct 20, 1999 [9]
is creator of: http://dbpedia.org/resource/Tabulator [1]
show 22 more values
alternate: http://rdf.freebase.com/rdf/en.tim_berners-lee [10]
Metadata [12]
is alternate of: Tim Berners-Lee - semanticweb.org [5]
Tim Berners-Lee - SMW-Sandbox [16]
alt label: show 11 values
born on date: 1955-06-08 [8]
Hide
Sources (20)
Approved (0)
Rejected (0)
1 Untitled document 33 facts | 2009-08-13
http://dbpedia.org/resource/Tim_Berners-Lee
2 tim berners lee NYLON 3 facts | 2009-08-13
http://www.nylon.gr/tag/tim-berners-lee/
3 Tim Berners-Lee - Wikipe... 8 facts | 2009-08-14
http://en.wikipedia.org/wiki/Tim_Berners-...
4 Tim Berners Lee | Webz 3 facts | 2009-08-13
http://www.webz.gr/tag/tim-berners-lee/
5 Tim Berners-Lee - semant... 3 facts | 2009-08-13
http://semanticweb.org/wiki/Tim_Berners-Lee
6 Untitled document 8 facts | 2009-08-13
http://en.wikipedia.org/wiki/Dr.%20Tim%20...
7 Tim Berners-Lee | Squio.... 3 facts | 2009-08-13
http://squio.nl/blog/tag/tim-berners-lee/
8 Timothy Berners-Lee 40 facts | 2009-06-09
http://www.mpii.de/
solo
approve
reject
9 Charlie Rose - Tim Berne... 4 facts | 2009-08-13
http://www.charlierose.com/guest/view/326... (cache)
10 Tim Berners-Lee facts - ... 3 facts | 2009-08-13
http://www.freebase.com/view/en/tim_berne...
reject all
approve all
http://example.loc/document.rdf
add source url

Faceted Browsing

- Allow users to filter data on the fly
- Very good for closed datasets
- More confusing for large datasets

Longwell

Magnetic-field-induced antiferromagnetism in the Kondo lattice

[URI]

Creator

- Beach, Kevin S. D. (Kevin Stuart David), 1975-

Contributor:

- Massachusetts Institute of Technology. Dept. of Physics.
- Patrick A. Lee.

Date

- 2004
- 2005-09-27T17:29:20Z

Subject and Keywords

- Physics.

Resource Type

- Thesis

Publisher

- Massachusetts Institute of Technology

Description

Ph.D.

Thesis (Ph. D.)--Massachusetts Institute of Technology, Dept. of Physics, 2004.

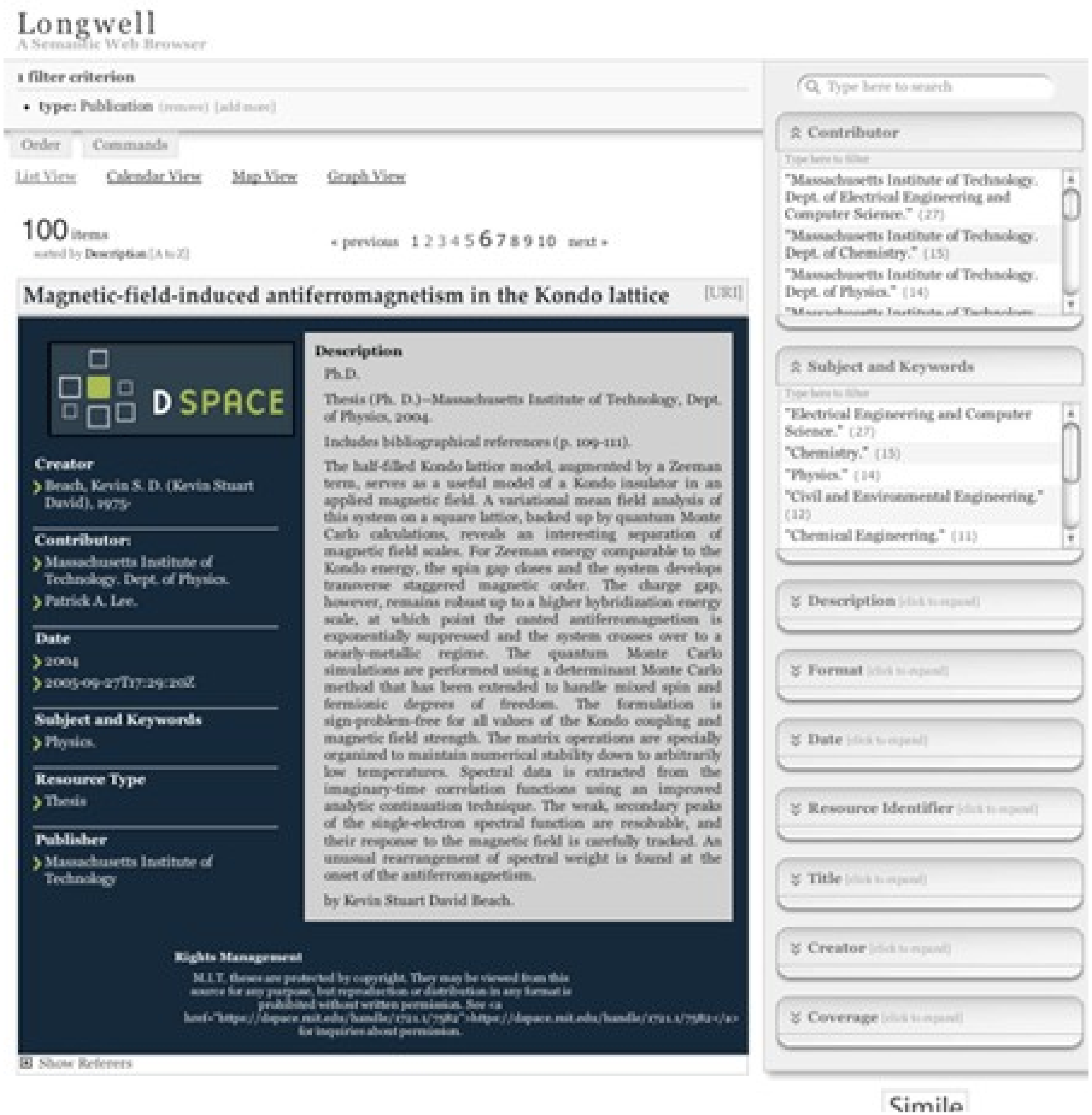
Includes bibliographical references (p. 109-111).

The half-filled Kondo lattice model, augmented by a Zeeman term, serves as a useful model of a Kondo insulator in an applied magnetic field. A variational mean field analysis of this system on a square lattice, backed up by quantum Monte Carlo calculations, reveals an interesting separation of magnetic field scales. For Zeeman energy comparable to the Kondo energy, the spin gap closes and the system develops transverse staggered magnetic order. The charge gap, however, remains robust up to a higher hybridization energy scale, at which point the canted antiferromagnetism is exponentially suppressed and the system crosses over to a nearly-metallic regime. The quantum Monte Carlo simulations are performed using a determinant Monte Carlo method that has been extended to handle mixed spin and fermionic degrees of freedom. The formulation is sign-problem-free for all values of the Kondo coupling and magnetic field strength. The matrix operations are specially organized to maintain numerical stability down to arbitrarily low temperatures. Spectral data is extracted from the imaginary-time correlation functions using an improved analytic continuation technique. The weak, secondary peaks of the single-electron spectral function are resolvable, and their response to the magnetic field is carefully tracked. An unusual rearrangement of spectral weight is found at the onset of the antiferromagnetism.

by Kevin Stuart David Beach.

⊞ Show Referers

Longwell



Longwell
A Semantic Web Browser
1 filter criterion
type: Publication (remove) [add more]
Order
Commands
List View
Calendar View
Map View
Graph View
100 items
sorted by Description [A to Z]
« previous 1 2 3 4 5 6 7 8 9 10 next »
Magnetic-field-induced antiferromagnetism in the Kondo lattice
[URI]
D SPACE
Creator
Beach, Kevin S. D. (Kevin Stuart David), 1975-
Contributor:
Massachusetts Institute of Technology. Dept. of Physics.
Patrick A. Lee.
Date
2004
2005-09-27T17:29:20Z
Subject and Keywords
Physics.
Resource Type
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Publisher
Massachusetts Institute of Technology
Description
Ph.D.
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Includes bibliographical references (p. 109-111).
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by Kevin Stuart David Beach.
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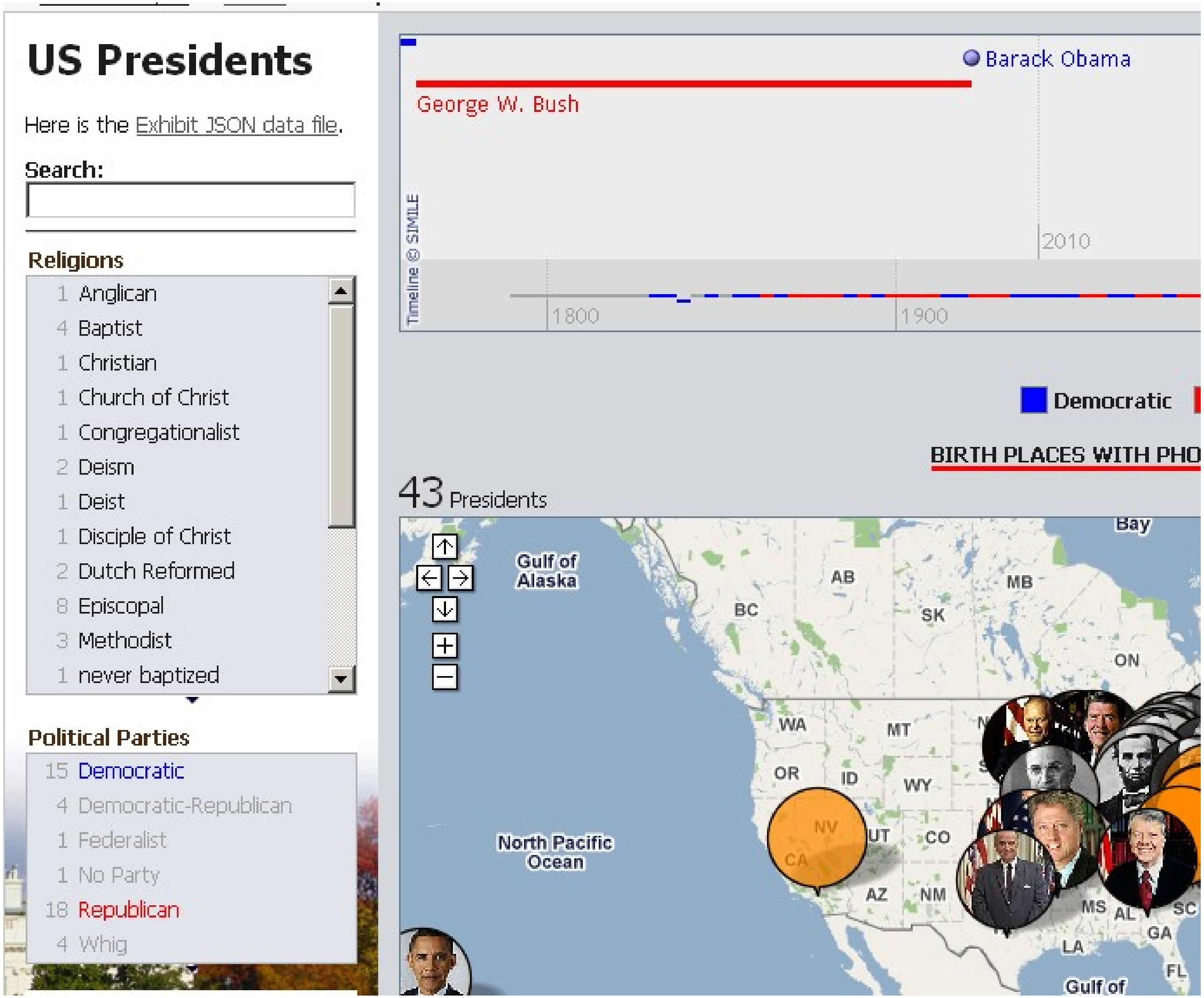
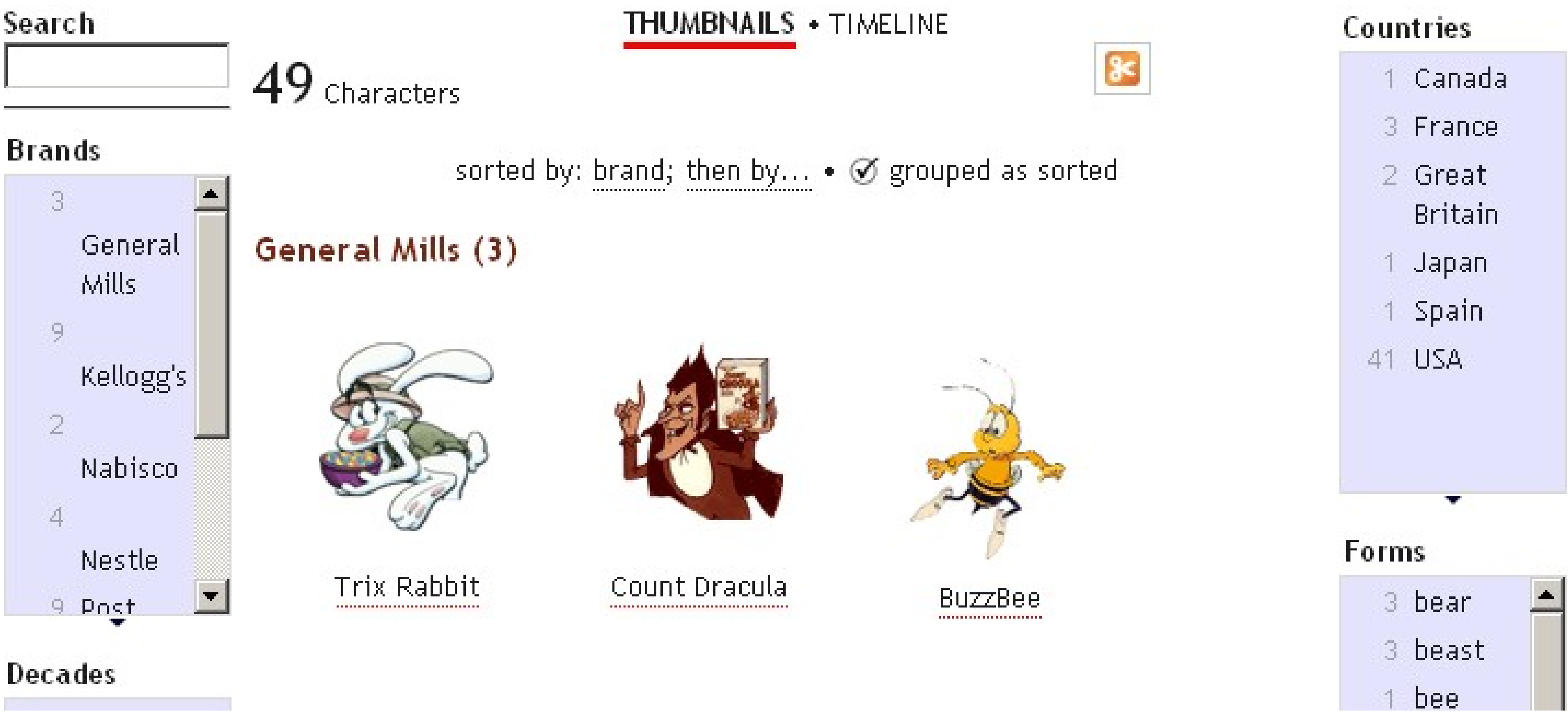
Type here to search
Contributor
"Massachusetts Institute of Technology. Dept. of Electrical Engineering and Computer Science." (27)
"Massachusetts Institute of Technology. Dept. of Chemistry." (15)
"Massachusetts Institute of Technology. Dept. of Physics." (14)
Subject and Keywords
"Electrical Engineering and Computer Science." (27)
"Chemistry." (15)
"Physics." (14)
"Civil and Environmental Engineering." (12)
"Chemical Engineering." (11)
Description
Format
Date
Resource Identifier
Title
Creator
Coverage
Simile

Exhibit

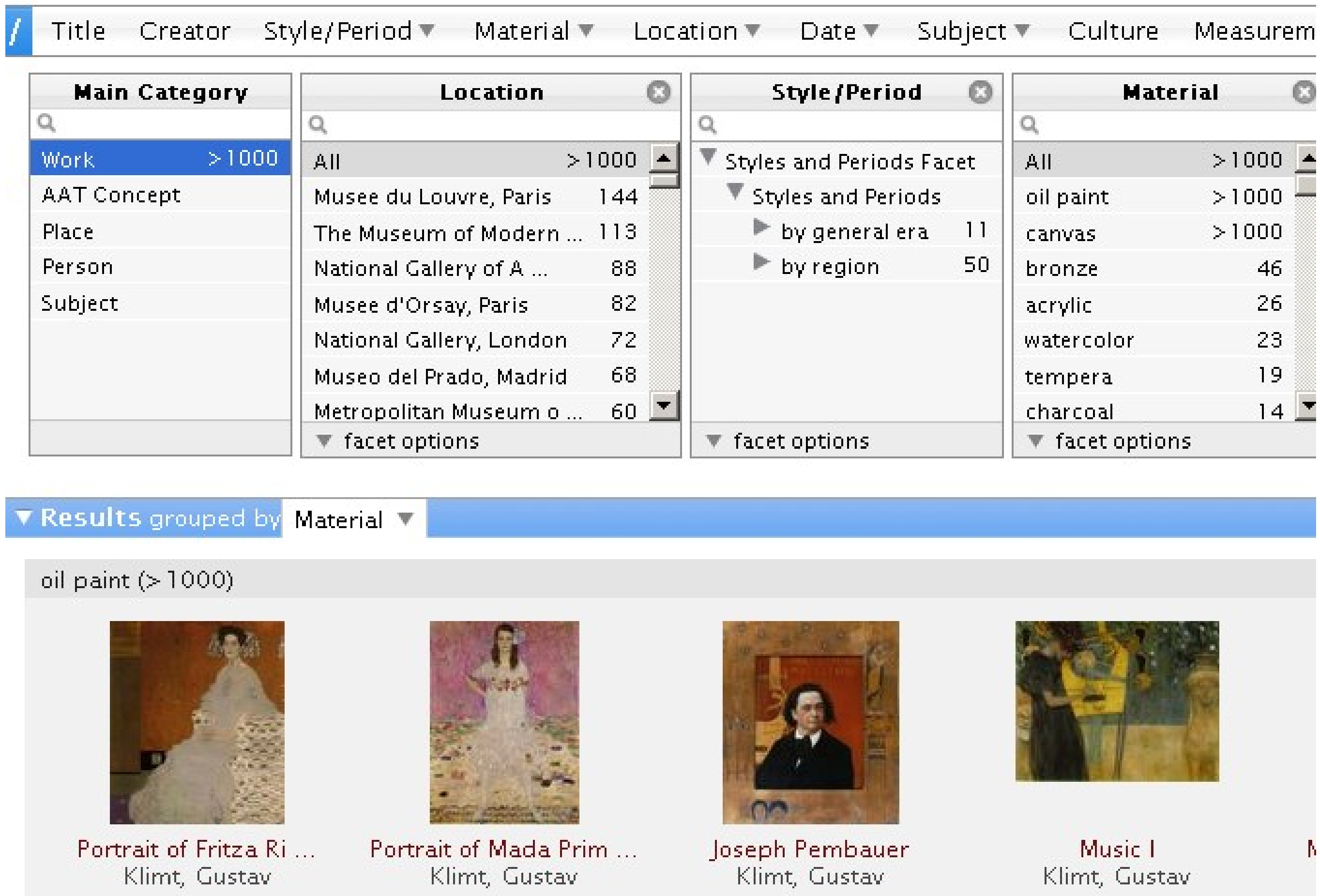


US Presidents
Here is the Exhibit JSON data file.
Search:
Religions
1 Anglican
4 Baptist
1 Christian
1 Church of Christ
1 Congregationalist
2 Deism
1 Deist
1 Disciple of Christ
2 Dutch Reformed
8 Episcopal
3 Methodist
1 never baptized
Political Parties
15 Democratic
4 Democratic-Republican
1 Federalist
1 No Party
18 Republican
4 Whig
Barack Obama
George W. Bush
Timeline © SIMILE
2010
1800
1900
Democratic
BIRTH PLACES WITH PHO
43 Presidents
Gulf of Alaska
North Pacific Ocean
Bay
AB
MB
BC
SK
ON
WA
MT
OR
ID
WY
NV
CA
UT
CO
AZ
NM
MS
AL
SC
GA
LA
FL
Gulf of

Exhibit


Search
Brands
3 General Mills
9 Kellogg's
2 Nabisco
4 Nestle
9 Post
Decades
THUMBNAILS • TIMELINE
49 Characters
sorted by: brand; then by... • grouped as sorted
General Mills (3)
Trix Rabbit
Count Dracula
BuzzBee
Countries
1 Canada
3 France
2 Great Britain
1 Japan
1 Spain
41 USA
Forms
3 bear
3 beast
1 bee

/facet



/
Title
Creator
Style/Period
Material
Location
Date
Subject
Culture
Measurem
Main Category
Work >1000
AAT Concept
Place
Person
Subject
Location
All >1000
Musee du Louvre, Paris 144
The Museum of Modern ... 113
National Gallery of A ... 88
Musee d'Orsay, Paris 82
National Gallery, London 72
Museo del Prado, Madrid 68
Metropolitan Museum o ... 60
facet options
Style/Period
Styles and Periods Facet
Styles and Periods
by general era 11
by region 50
facet options
Material
All >1000
oil paint >1000
canvas >1000
bronze 46
acrylic 26
watercolor 23
tempera 19
charcoal 14
facet options
Results grouped by Material
oil paint (>1000)
Portrait of Fritza Ri ...
Klimt, Gustav
Portrait of Mada Prim ...
Klimt, Gustav
Joseph Pembauer
Klimt, Gustav
Music I
Klimt, Gustav

What makes a SW Browser “Good”?

- Easy deployment?
- Pretty visualizations?
- Minimal required Semantic Web knowledge?
- Ease of data generation?
- Discussion: How can you do all of these things while still guaranteeing that data is usable on the Semantic Web?

Links

- Circle and Arrow:
  - IsaViz http://www.w3.org/2001/11/IsaViz/
  - Welkin http://simile.mit.edu/welkin/
- Data Table / Mashup:
  - Disco http://www4.wiwiss.fu-berlin.de/bizer/ng4j/disco/
  - OpenLink RDF Browser http://demo.openlinksw.com/DAV/JS/rdfbrowser/index.html
  - Tabulator http://dig.csail.mit.edu/2007/tab/
  - Sig.ma http://sig.ma/
- Faceted Browsing:
  - /facet http://slashfacet.semanticweb.org/
  - mSpace http://mspace.fm/
  - Exhibit http://www.simile-widgets.org/exhibit/
  - Longwell http://simile.mit.edu/wiki/Longwell