

Linked Data



1 2 3 4 5

- 1 --One goal
- 2 – Two types of questions
- 3 – RDF triples
- 4 – Four principles
- 5 – Five star LOD

Learn by Understanding

Learn by Analyzing

Marcia Zeng, 2018 DIS

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Five-Star LOD ★★★★★

Sir Tim Berners-Lee, the inventor of the WWW and the initiator of Linked Data, presented a Star Scheme for measuring the rank of a dataset:



★ Available on the web (whatever format) *but with an open licence, to be Open Data*

★★ Available as machine-readable structured data (e.g. excel instead of image scan of a table)

★★★ as (2) plus non-proprietary format (e.g. CSV instead of excel)

★★★★ All the above plus, Use open standards from W3C (RDF and SPARQL) to identify things, so that people can point at your stuff

★★★★★ All the above, plus: Link your data to other people's data to provide context

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<https://www.w3.org/DesignIssues/LinkedData.html>

Learn by Analyzing

Cases: Using LOD in the LAMs*

1. Special Collections, Archives
 - a. Linked Jazz
 - b. Online Coins of the Roman Empire (OCRE)
2. Bibliographic data
 - a. WorldCat
 - b. The British National Bibliography (BNB)
3. Knowledge organization systems (KOS)
 - thesauri, name authorities, and others
 - a. FAST
 - b. Getty Vocabs
4. Digital Scholarships
 - VIVO based - Scholars @ Cornell

*LAMs = Libraries, archives, and museums

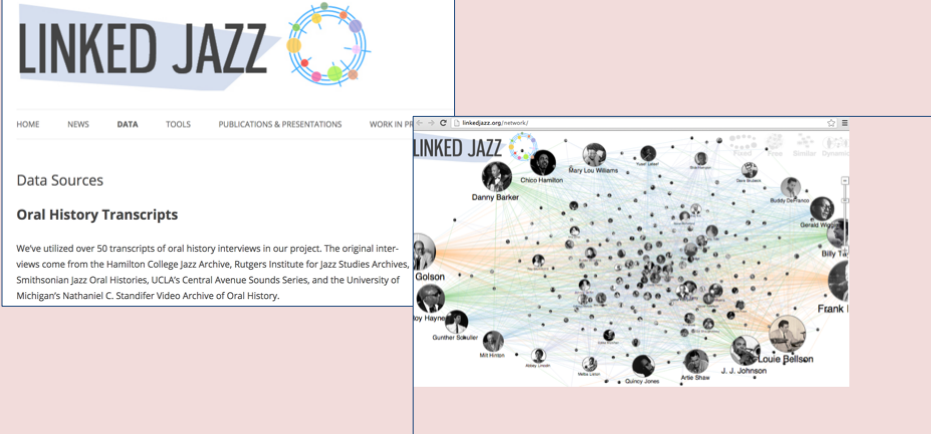
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1. Special Collections, Archives

a. Linked Jazz <http://linkedjazz.org/>

The project focuses on digitalized archives of jazz history to expose relationships between musicians and reveal their community's network.



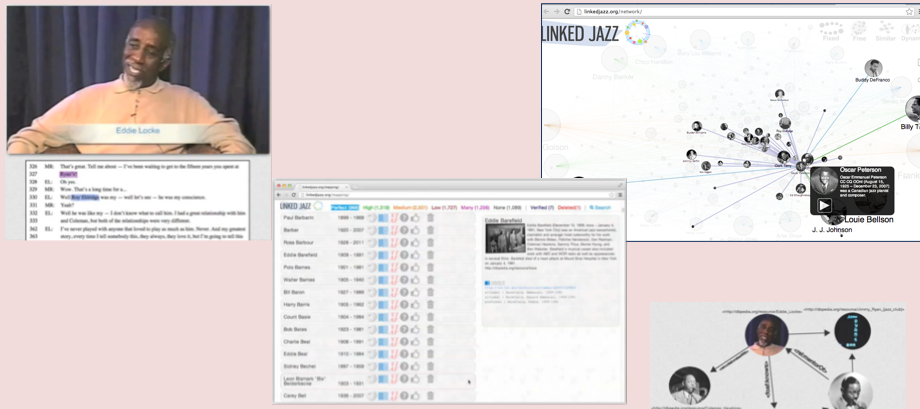
The screenshot displays the Linked Jazz website interface. On the left, there is a navigation menu with links for HOME, NEWS, DATA, TOOLS, PUBLICATIONS & PRESENTATIONS, and WORK IN PROGRESS. Below the menu, the 'Data Sources' section is visible, with a sub-section for 'Oral History Transcripts'. The main content area features a large, complex network graph titled 'LINKED JAZZ'. The graph consists of numerous circular nodes, each representing a jazz musician, connected by lines of varying colors (blue, green, orange, red) representing relationships. Some nodes are larger and more prominent, such as those for Louis Armstrong, Duke Ellington, and Charlie Parker. The graph is set against a light blue background with a grid pattern.

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<http://linkedjazz.org/network/>

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Methodology Summary:

- A natural processing tool pulls excerpts from transcripts of interviews with jazz musicians that mention a relationship with another jazz musician.
- After the process of controlling synonyms and eliminating ambiguity, the musician names were mapped to the DBpedia, and data about each person was obtained.
- The relationships were presented based on an ontology.
- A visualization tool was used to present a unique interactive interface.

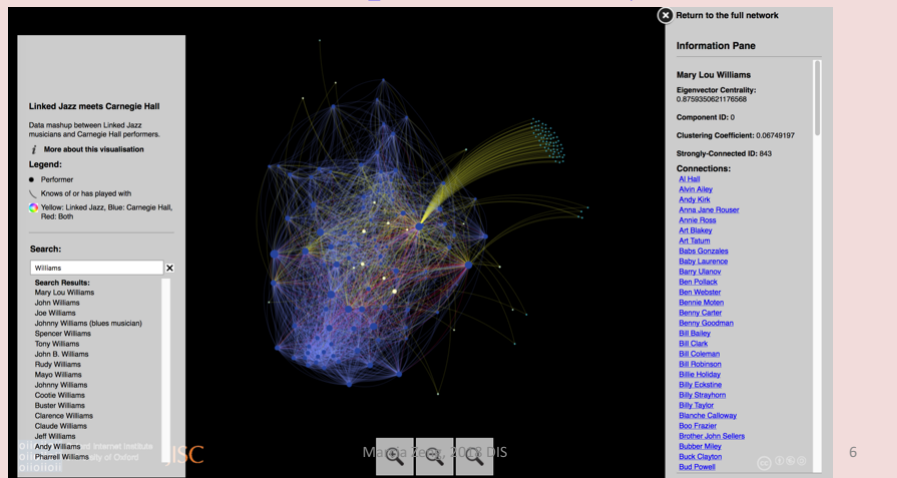


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Linked Jazz and Carnegie Hall (In development) [About](#)

- [Visualized result](#) in Gephi. (Data mashup between Linked Jazz musicians and Carnegie Hall performers.)

http://pfch.nyc/linked_jazz_meets_carnegie_hall/CH-LJ_network/index.html#Mary%20Lou%20Williams



(cont.) 1. Special Collections, Archives

<http://numismatics.org/ocre/>

b. Online Coins of the Roman Empire (OCRE)

OCRE
Browse Search Maps Symbols Identify a Coin Contributors Visualize Queries APIs About Language

Search

OCRE
Online Coins of the Roman Empire

Online Coins of the Roman Empire (OCRE), a joint project of the American Numismatic Society and the Institute for the Study of the Ancient World at New York University, is a revolutionary new tool designed to help in the identification, cataloging, and research of the rich and varied coinage of the Roman Empire. The project records every published type of Roman Imperial Coinage from Augustus in 31 BC, until the death of Zeno in AD 491. This is an easy to use digital corpus, with downloadable catalog entries, incorporating over 43,000 types of coins.

As of April 2017, OCRE provides links to examples present in nearly 20 American and European databases (both archaeological and museum in context), including the ANS collection, the Münzkabinett of the State Museum of Berlin, and the British Museum, now totalling over 100,000 physical specimens. Between these collections, OCRE is now able to illustrate 50% of the imperial coin types that it contains. Moving forward, as more collections join the project, it will eventually incorporate and display almost all recorded Roman Imperial coin types. Furthermore, it draws findspot information from another ANS-developed resource, *Coin Hoards of the Roman Republic*, enabling the mapping of the

Share
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Linked Data

1.b OCRE

- Ontological classes -- browse

OCRE Browse Search Maps Symbols Identify a Coin Contributors Visualize Queries APIs About Language

Data Options
Geographic
Keywords
Refine Results
Coin Type Number
Date Range

All Terms Map Results
Displaying records 1 to 20 of 42748 total results.

RIC I (second edition) Augustus 1A
Date: 25 BC - 23 BC
Denomination: Quinarus
Mint: Emerita
Obverse: AVGVSTI: Head of Augustus, bare, left
Reverse: P CARISI LEG: Victory standing right, placing wreath on trophy with dagger and sword at base
objects: 13; hoard: 1

RIC I (second edition) Augustus 1B
Date: 25 BC - 23 BC
Denomination: Quinarus
Mint: Emerita
Obverse: AVGVSTI: Head of Augustus, bare, left
Reverse: P CARISI LEG: Victory standing right, placing wreath on trophy with dagger and sword at base
objects: 15

RIC I (second edition) Augustus 2A
Date: 25 BC - 23 BC
Denomination: Denarius
Mint: Emerita
Obverse: AVGVSTI: Head of Augustus, bare, left
Reverse: P CARISI LEG: Victory standing right, placing wreath on trophy with dagger and sword at base
objects: 6; hoard: 1

objects: 4; hoards: 3

Modeling in an ontology (formed in classes, properties, relationships);
Following Linked Data principles;
Using RDF triples for entities;
Querying in SPARQL language.

1.b OCRE

For an individual object, a user can find auto-generated data related to it, the map(s), and quantitative analysis.

RIC VI Londinium 66

Examples of this type | Quantitative Analysis

Typological Description

Date Range
 From Date: AD 305
 To Date: AD 307

Object Type: Coin
Manufacture: Struck
Denomination: AE1
Material: Bronze

Authority: Constantius Chlorus

Geographic
Mint: Londinium
Region: Britannia

Obverse
Legend: CONSTANTINVS NOBILI C
Type: Bust of Constantine I, laureate, draped, cuirassed, right, seen from front
Portrait: Constantine I

Reverse
Legend: GENIO POPVLI ROMANI
Type: Genius, wearing modius, nude, chlamys draped over left shoulder, standing left, holding patera in right hand and cornucopiae in left hand
Deity: Genius

Map

Quantitative Analysis
 Average measurements for this coin type:
 Axis 6.50
 Weight 9.80

1. Select Measurement
 Axis
 Diameter
 Weight

2. Select Chart Type
 bar
 column

3. Compare by Category
 Denomination: AE1
 Mint: Londinium
 Region: Britannia
 Manufacture: Struck
 Material: Bronze
 Authority: Constantius Chlorus
 Portrait: Constantine I
 Deity: Genius

4. Add Queries +Add New

Generate Chart

Examples of this type

Collection	British Museum	British Museum
1927.0616.159	1927.0616.160	1927.0616.160
Axis: 6.00	Axis: 7.00	Axis: 7.00
Weight: 9.363	Weight: 10.244	Weight: 10.244

<http://numismatics.org/ocre/id/ric.6.lon.66>

1.b OCRE

- Visualize your queries on-the-fly

How? <http://wiki.numismatics.org/numishare:visualize>

OCRE Browse Search Maps Symbols Identify a Coin Contribution Visualize Queries API About Language

Visualize Queries

Use the data selection and visualization options below to generate a chart based on selected parameters. Instructions for using this feature can be found here: <http://wiki.numismatics.org/numishare:visualize>.

1. Select Numeric Response Type
 Percentage Count

2. Select Chart Type
 column bar

3. Select Categories for Analysis
 Authority Deity Denomination Findspot Issuer Manufacture
 Material Mint Object Type Portrait Region

Custom Queries +Add Query

4. Compare Queries +Add Query

Comparison Query: * * Remove Query

Optional Settings [Hide/Show Options](#)

Generate Chart

Count: Portrait

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OCRE is made available under the Open Database License. OCRE has been made possible in part by a major grant from the National Endowment for the Humanities.

- Using SPARQL queries to find;
- Auto-Visualizing;
- A user does not need to see or use SPARQL language.

1.b OCRE

- Interact with a map

OCRE Browse Search **Maps** Symbols Identify a Coin Contributors Visualize Queries APIs About Language - Search

Maps

For usage instructions, see <http://wiki.numismatics.org/numishare:maps>. View in fullscreen mode.

Authority -	Deity -	Denomination -	Findspot -
Issuer -	Manufacture -	Material -	Object Type -
Portrait -	Region -		

Legend ■ Mint ■ Findspot ■ Subject

OCRE is made available under the Open Database License. Powered by Numishare. www.numismatics.org OCRE has been made possible in part by a major grant from the National Endowment for the Humanities: Celebrating 50 Years of Excellence

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1.b OCRE

numismatics.org/ocre/maps Search

OCRE Browse Search Maps Symbols Contributors Visualize Queries APIs About Language - Search

Maps

For usage instructions, see <http://wiki.numismatics.org/numishare:maps>. View in fullscreen mode.

Authority -	Deity -	Denomination -	Findspot -
Issuer -	Manufacture -	Material: Gold -	Object Type -
Portrait: Marcus Aurelius -	Region: Italy -		

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For more information

- Webinar: Ethan Gruber: **From 0 to 60 on SPARQL queries in 50 minutes**, May 13, 2015
Watch the YouTube: <https://www.youtube.com/watch?v=3YhG5QQmhvU>
- Ethan Gruber's webpage <http://numismatics.org/ethangruber/>
 - Where you can connect to his Github, <https://github.com/ewg118>
 - SPARQL queries <https://gist.github.com/ewg118>
- A Final report submitted to the funder, NEH, 2017
 - <http://www.dayofarchaeology.com/final-report-to-the-neh-for-online-coins-of-the-roman-empire/>


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 - VIVO based - Scholars @ Cornell

Case: 2.a WorldCat

<http://www.worldcat.org/oclc/246662790>

Pride and Prejudice

creator 

schema:creator <http://viaf.org/viaf/102333412>

www.worldcat.org/title/pride-and-prejudice/oclc/246662790

Linked Data

More info about Linked Data

Primary Entity

```
<http://www.worldcat.org/oclc/246662790> # Pride and prejudice
a schema:Book, schema:CreativeWork,
library:oclcnum "246662790";
library:placeOfPublication <http://experiment.worldcat.org/entity/work/data/3535#Place/harmondsworth_u_a>; # Harmondsworth u.a.
library:placeOfPublication <http://id.loc.gov/vocabulary/countries/xxk>;
schema:about <http://dewey.info/class/823.7>;
schema:bookEdition "Reprint.";
schema:bookFormat bgn:PrintBook;
schema:creator <http://viaf.org/viaf/102333412>; # Jane Austen
schema:datePublished "1984";
schema:exampleOfWork <http://worldcat.org/entity/work/id/3535>;
schema:inLanguage "en";
schema:isPartOf <http://experiment.worldcat.org/entity/work/data/3535#Series/penguin_english_library>; # Penguin English library.
schema:name "Pride and prejudice";
schema:productID "246662790";
schema:publication <http://www.worldcat.org/title/-/oclc/246662790#PublicationEvent/harmondsworth_u_a_penguin_books_1984>;
schema:publisher <http://experiment.worldcat.org/entity/work/data/3535#Agent/penguin_books>; # Penguin Books
schema:workExample <http://worldcat.org/isbn/9780140430724>;
wdrs:describedby <http://www.worldcat.org/title/-/oclc/246662790>;
```

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Case 2.b The British National Bibliography (BNB)

-- uses its own ontology

About:

- The British Library is the national library of the UK and is responsible for distributing metadata describing its collections and recording UK publishing output in the *British National Bibliography (BNB)* <http://bnb.data.bl.uk>.
- In 2011, the British Library began publishing a LOD version of the BNB as part of its open metadata strategy. The move to LOD BNB proved influential among the library community in moving the Linked Data 'debate' from theory to practice.
- The LOD BNB has continued to evolve with regular monthly updates, the inclusion of new links (e.g. to the ISNI) and content (e.g. serials).

Try:

- Go to its Flint Sparql Endpoint at: <http://bnb.data.bl.uk/flint-sparq>
- Use the sample queries to see examples.
- Try to form your own queries and get different datasets.

Read:

- How to get the bulk download <http://www.bl.uk/bibliographic/download.html>

1. Query text for "Which titles by detective writer Ian Rankin appear in the BNB?"

SELECT *
WHERE {
?s ?p ?o
}

References:
Lists of all classes, properties, and prefixes of the metadata vocabularies used by BNB.

2. Results in Plain text. Other output options are XML and JSON.

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 - VIVO based - Scholars @ Cornell

*LAM = Libraries, archives, and museums

3. KOS
a. **FAST**

SEARCH FAST

Keywords Kennedy, John F. (John Fitzgerald), 1917-1963

FAST TERMS

Search results for: "Kennedy, John F. (John Fitzgerald), 1917-1963"

Limit Results by: All

Displaying 1 to 2 of 2

Heading	Facet	Uses
Kennedy, John F. (John Fitzgerald), 1917-1963	person	12258
Kennedy, John F. (John Fitzgerald), 1917-1963 (Spirit)	person	1

TERM DETAILS

Kennedy, John F. (John Fitzgerald), 1917-1963 Find in WorldCat

USED FOR:

- Gannaldi, 1917-1963
- JFK (John Fitzgerald Kennedy), 1917-1963
- Kan-nai-ti, 1917-1963
- Kanadi, Jün Fitz J'irald, 1917-1963
- Kanidi, Jün F., 1917-1963
- K'enedi, 1917-1963
- Kenedi, Dzhon F., 1917-1963
- Kenedi, Džon Fridžerald, 1917-1963
- Kenedi, G'on F., 1917-1963
- Kenedijs, Džons F., 1917-1963
- Kennedi, Džon Fišičžerald, 1917-1963
- Kennedy, Jack, 1917-1963
- Kennedy, John Fitzgerald, 1917-1963
- Kennedy, Ken, 1917-1963

USAGE:

LC (2016) Subject Usage: 1,486
WC (2016) Subject Usage: 12,258

RECORD ID:
fst00035588

SOURCES AND OTHER LINKS:

- Kennedy, John F. (John Fitzgerald), 1917-1963—(DLC)n 79055297
- John F. Kennedy—(uri)http://en.wikipedia.org/wiki/John_F._Kennedy
- Kennedy, John F. (John Fitzgerald), 1917-1963—(uri)https://viaf.org/viaf/68910251

LINKS TO FULL RECORD:

- Permanent Link <http://id.worldcat.org/fast/35588>
- MARC-21 record <http://id.worldcat.org/fast/35588/marc21.xml>
- RDF record <http://id.worldcat.org/fast/35588/rdf.xml>

Source: extracted screenshots (2017-07-12)
From <http://fast.oclc.org/searchfast/>

Marcia Zeng, 2018 DIS

3. KOS
a. **FAST**

John F. Kennedy's entry in FAST is enriched with other sources.

- The **DBpedia** identifiers allow FAST terms to include detailed information that is usually excluded in authority records.
- The **VIAF** URI allows FAST terms to take advantage of all of the various string values included in **VIAF** without having to manually include the values in the RDF triples for the specific term.

```

<rdf:RDF xml:base="http://id.worldcat.org/fast/">
  <rdf:Description rdf:about="35588">
    <det:identifier>35588</det:identifier>
    <skos:inScheme rdf:resource="ontology/1.0#fast"/>
    <rdf:type rdf:resource="http://schema.org/Person"/>
    <skos:inScheme rdf:resource="ontology/1.0#facet-Personal"/>
    <skos:prefLabel>Kennedy, John F. (John Fitzgerald), 1917-1963</skos:prefLabel>
    <schema:name>Kennedy, John F. (John Fitzgerald), 1917-1963</schema:name>
    <schema:sameAs>
      <rdf:Description rdf:about="http://id.loc.gov/authorities/names/n79055297">
        <rdfs:label>Kennedy, John F. (John Fitzgerald), 1917-1963</rdfs:label>
      </rdf:Description>
    </schema:sameAs>
    <foaf:focus>
      <rdf:Description rdf:about="http://en.wikipedia.org/wiki/John_F._Kennedy">
        <rdfs:label>John F. Kennedy</rdfs:label>
      </rdf:Description>
    </foaf:focus>
    <schema:sameAs>
      <rdf:Description rdf:about="https://viaf.org/viaf/68910251">
        <rdfs:label>Kennedy, John F. (John Fitzgerald), 1917-1963</rdfs:label>
      </rdf:Description>
    </schema:sameAs>
  </rdf:Description>
</rdf:RDF>

```

Source: extracted screenshots (2017-07-12) at <http://experimental.worldcat.org/fast/35588/rdf.xml>

3. KOS
a. **FAST**

The GeoNames data is used to power MapFAST, which is a Google Maps mash-up.

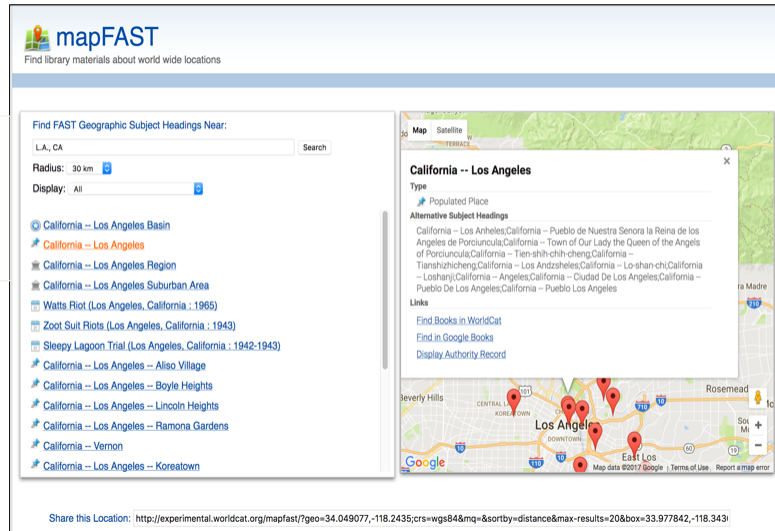


Image source: Captured Aug. 2017. <http://experimental.worldcat.org/mapfast/>

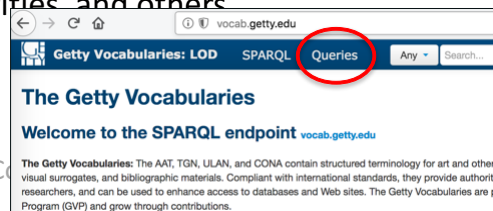
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*LAM = Libraries, archives, and museums

3. KOS
b. Getty Vocab

<http://vocab.getty.edu>

<http://vocab.getty.edu/sparql>

We will try them at the Hands-on session.

4.20 **Places Nearly Each Other** <http://vocab.getty.edu/queries>

5 **ULAN-Specific Queries**

5.1 Agents by Type

5.2 Associative Relations of Agent

5.3 Female Artists

5.4 Female Artists as a Hobby

5.5 Native American Painters

5.6 Names of Native American Painters

5.7 Architects Born in the 14th or 15th Century

5.8 Indian and Pakistani Architectural Groups

5.9 Non-Italians Who Worked in Italy

5.10 Artists Associated to a Given Patron or His Family

5.11 German, Dutch, Flemish printmakers, listed with their teachers

5.12 Artists Whose Identity May be Associated or Confused With Another

5.13 Ordered Hierarchy of Given Subject

5.14 Ancient Artists or Groups by Nationality

5.15 Art Repositories in the USA by State

5.16 Popes and Their Reigns

5.17 Pope Reign Durations

5.18 Life Events

3. b. Getty Vocab

What kinds of query examples?

ULAN

Union List of Artist Names

Name authorities offer foundational structured data for network analyses.

At the query templates page Find the section for ULAN.

There are many interesting query examples.

4.20 **Places Nearly Each Other** <http://vocab.getty.edu/queries>

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How to use a template?

(1) Choose a query (left), e.g., #5.2; the template box will show up (lower-right). (2) At that template box's upper-right corner, click on that SPARQL sign; the query will automatically jump up to the Query box (top). (3) Submit.

The screenshot shows the 'Getty Vocabularies: LOD SPARQL Queries' interface. On the left, a list of queries is visible, with #5.2 'Associative Relations of Agent' highlighted. The main content area displays the SPARQL query editor with the following query:

```

1 select * {
2   ulan:500115493 ?rel ?x.
3   ?rel sesame:directSubPropertyOf skos:related.
4   ?x gvp:prefLabelGVP/x1:literalForm ?name.
5   ?x foaf:focus/gvp:biographyPreferred/schema:description ?bio.
6
7   optional [
8     rdf:subject ulan:500115493;
9     rdf:predicate ?rel;
10    rdf:object ?x;
11    rdfs:comment ?comment]]}

```

Below the query editor, there are checkboxes for 'Include inferred' and 'Expand results over equivalent URIs'. A 'Submit' button is located at the bottom right of the query editor. A blue arrow points from the SPARQL sign in the query editor to the 'Submit' button. Another blue arrow points from the SPARQL sign to the query editor. A third blue arrow points from the SPARQL sign to the 'Submit' button.

The result: "all associative relationships of ulan:500115493 Duerer, Albrecht" (showing a portion of the results).

The screenshot shows the 'Getty Vocabularies: LOD SPARQL Queries' interface displaying the results of a SPARQL query. The results are shown in a table with the following columns: rel, x, name, bio, and comment.

rel	x	name	bio	comment
gvp:ulan1101_teacher_of	ulan:500024290	Baldung, Hans	German painter, 1484/1485-1545	-
gvp:ulan1101_teacher_of	ulan:500101472	Herrant, Crispin	German painter, active 1529, died 1549	-
gvp:ulan1105_apprentice_of	ulan:500031446	Wolgemut, Michael	German painter and printmaker, 1434/1437-1519	from 1486 to 1489
gvp:ulan1106_apprentice_was	ulan:500013506	Schäufelein, Hans, the elder	German painter, draftsman, and designer, born ca. 1482, died 1539 or 1540	-
gvp:ulan1106_apprentice_was	ulan:500002241	Traut, Wolf	German painter and draftsman, ca. 1480-1520	-
gvp:ulan1202_patron_was	ulan:500260809	Maximilian I, Holy Roman Emperor@en	Holy Roman Emperor, 1459-1519	-
gvp:ulan1303_collaborated_with	ulan:500084340	Pirckheimer, Willibald	German humanist and writer, 1470-1530	-
gvp:ulan1308_assisted_by	ulan:500006353	Pencz, Georg	German painter, draftsman, and engraver, ca. 1500-1550	ca. 1523
gvp:ulan1501_sibling_of	ulan:500356338	Dürer, Endres	German goldsmith, 1484-1555	-
gvp:ulan1501_sibling_of	ulan:500005425	Dürer, Hans@de	German painter and printmaker, 1490-1534	-
gvp:ulan1511_child_of	ulan:500102378	Dürer, Albrecht, the elder@en	German goldsmith, 1427-1502	-
gvp:ulan2572_founder_of	ulan:500356337	Albrecht Dürer Workshop@en	German workshop, established 1495	-

Getty Vocabularies: LOD SPARQL Queries **TGN**

4 TGN-Specific Queries

- 4.1 Places by Type
- 4.2 Places, with English or GVP Label
- 4.3 Places by Direct and Hierarchical Type
- 4.4 Breakdown of Sovereign States by Type
- 4.5 Inhabited Places That Were Sovereign States
- 4.6 Places by Type and Parent Place
- 4.7 Places by Type, with placeTypePreferred
- 4.8 Places by Triple FTS
- 4.9 Places by FTS Parents
- 4.10 Capitals by Association
- 4.11 Members of the European Union
- 4.12 Members of the United Nations
- 4.13 Geo Chart with sgvizler
- 4.14 Column Chart with sgvizler
- 4.15 Countries and Capitals By Type and Containment
- 4.16 Places by Coordinate Bounding Box
- 4.17 Places Within Bounding Box
- 4.18 Places by Type Within Bounding Box
- 4.19 Places Outside Bounding Box (Overseas Possessions)
- 4.20 Places Nearby Each Other

Query:

```
1 select ?place
2 ?place skos
```

Browse the examples of queries

Thesaurus for Geographic Names (TGN)

You can obtain special RDF graphs or datasets for very complicated questions, and revealing unknown relationships.

KOS in LOD become knowledge bases of research.

4.10 Places by Type Within Bounding Box

Find places whose coordinates are within the bounding box

```
select ?place ?name
```

http://vocab.getty.edu/queries#Top-level_Subjects Marcia Zeng, 2018 DIS 27

Steps: (1) Choose #4.18 query, (2) click on that SPARQL sign in that 4.18 template box. After click on that SPARQL sign, the query should be automatically uploaded to the top box. (3) Submit.

Note: Since this is a complicated query, it will run a few seconds. Be patient.

E.g., Look for **castles around The Netherlands** (within the boundary of 50.787185 3.389722 53.542265 7.169019)

Getty Vocabularies: LOD SPARQL Queries **TGN**

4 TGN-Specific Queries

- 4.1 Places by Type
- 4.2 Places, with English or GVP Label
- 4.3 Places by Direct and Hierarchical Type
- 4.4 Breakdown of Sovereign States by Type
- 4.5 Inhabited Places That Were Sovereign States
- 4.6 Places by Type and Parent Place
- 4.7 Places by Type, with placeTypePreferred
- 4.8 Places by Triple FTS
- 4.9 Places by FTS Parents
- 4.10 Capitals by Association
- 4.11 Members of the European Union
- 4.12 Members of the United Nations
- 4.13 Geo Chart with sgvizler
- 4.14 Column Chart with sgvizler
- 4.15 Countries and Capitals By Type and Containment
- 4.16 Places by Coordinate Bounding Box
- 4.17 Places Within Bounding Box
- 4.18 Places by Type Within Bounding Box
- 4.19 Places Outside Bounding Box (Overseas Possessions)
- 4.20 Places Nearby Each Other

Query:

```
1 prefix ontogeo: <http://www.ontotext.com/owlim/geo#>
2 select distinct * {
3   ?place skos:inScheme tgn ;
4   gvp:placeType|(gvp:placeType/gvp:broaderGenericExtended) [rdfs:label "castles (fortific
5   foaf:focus [ontogeo:within(50.787185 3.389722 53.542265 7.169019)];
6   gvp:prefLabelGVP [xl:literalForm ?name];
7   gvp:parentString ?parents}
```

Include inferred

Expand results over equivalent URIs

3 Submit

1 4.18 Places by Type Within Bounding Box

Let's specialize the previous query and look for castles around The Netherlands, we get 170:

```
prefix ontogeo: <http://www.ontotext.com/owlim/geo#>
select distinct * {
  ?place skos:inScheme tgn ;
  gvp:placeType|(gvp:placeType/gvp:broaderGenericExtended) [rdfs:label "castles (fortifications)"#en];
  foaf:focus [ontogeo:within(50.787185 3.389722 53.542265 7.169019)];
  gvp:prefLabelGVP [xl:literalForm ?name];
  gvp:parentString ?parents}
```

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4.19 Places Outside Bounding Box (Overseas Possessions)

E.g., Look for castles around The Netherlands

TGN

Getty Vocabularies: LOD

SPARQL Queries Any Search...

Results: (170)

place	name	parents
tgn:7267137	Oldenaller@nl	Gelderland, Nederland, Eur
tgn:7267925	Nijenrode@nl	Utrech
tgn:7259882	Kasteel Ampsen@nl	Gelde
tgn:7268095	Panser@nl	Groni
tgn:7269751	Mattenses@nl	Groni
tgn:7272454	Verhildersum@nl	Groni
tgn:7269594	Menkemaborg@nl	Groni

4 Download SPARQL Re

(4) Download the datasets in a selected format. The best way is to download the **csv** file.

(5) You should either keep the query in your CSV file or make a note what you searched for and in which boundary.

Finished.

Muiderslot

Source: http://vocab.getty.edu/tgn/7270110

ID: 7270110

Muiderslot (castle)

Coordinates: Lat: 52 20 00 N degrees minutes Long: 005 04 00 E degrees minutes Lat: 52.3333 decimal degrees Long: 5.0667 decimal degrees

Names: Muiderslot (preferred, NA, V, Dutch, U)

Hierarchical Position:

- World (facet)
- Europe (continent) (P)
- Netherlands (nation) (P)
- North Holland (province) (P)
- Muiderslot (castle) (P, U)

Place Types: castle (preferred, C)

Sources and Contributors:

Muiderslot: [VP Preferred] NGA/NIMA database (2003-)

Subject: [VP] NGA/NIMA database (2003-) -2149724

6 Optional: (6) Click on any castle's ID, & open the single data record for this concept. (7) Click on the Website to see its normal html view.

7

Europe North Holland Netherlands

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E.g., Query a specific place type (e.g., World Heritage Sites) in a geographic boundary .

TGN

World Heritage Sites within (24.75083 28.95778 43.80722 108.92861) around the Silk road.

SPARQL Queries Any Search... Search Brief

Results: (32)

Download SPARQL Results in: JSON XML CSV TSV

place	name	parents
tgn:7059176	Mausoleum of Khoja Ahmed Yasawi	Ongüstik Qazaqstan, Qazaqstan, World
tgn:1056987	Mtskheta	Mtskheta Mtianeti, Sakartvelo, Asia, World
tgn:7032530	Aramus	Kotayk', Hayastan, Asia, World
tgn:7032531	Zart'onk'	Armavir, Hayastan, Asia, World
tgn:4004270	Geghard	Kotayk', Hayastan, Asia, World
tgn:1054029	Qobustan	Baki, Azerbaycan, Asia, World
tgn:7029798	Qianfodong@zh-latn-pinyin-x-notone	Gansu, Zhongguo, Asia, World
tgn:7059150	Sulaiman-Too	Osh, Kyrgyzstan, Asia, World
tgn:1100582	Humayun's Tomb	Delhi, Bhārat, Asia, World
tgn:8003937	Mohenjo-Daro	Sindh, Pākistān, Asia, World
tgn:7032815	Rummin-dei	Lumbini, Nepāl, Asia, World
tgn:7032812	Kathmandu Valley	Nepāl, Asia, World
tgn:4011486	Um er-Rasas	Al 'Āshimah, Al Urduṅ, Asia, World
tgn:7001309	Abi Minā@en	Al Gharbiyah, Miṣr, Africa, World
tgn:7002856	Baalbek	Baalbek-Hermel, Lubnān, Asia, World
tgn:7032896	Tchoghja Zanbil	Khūzestān, Irān, Asia, World
tgn:7002862	Tyre@en	Liban-Sud, Lubnān, Asia, World
tgn:7059151	Aanjar	Béqaa, Lubnān, Asia, World
tgn:7018516	Jubayl	Mont-Liban, Lubnān, Asia, World
tgn:8005850	Taxila@en	Punjab, Pākistān, Asia, World
tgn:7059152	Wādī Qādīshā	Lubnān, Asia, World
tgn:1103449	Arz Lebnāne	Liban-Nord, Lubnān, Asia, World
tgn:7032332	Minaret of Jam	Ghōr, Afghānestān, Asia, World
tgn:7018835	Palmyra	Ĥīms, Sūriyah, Asia, World
tgn:7002383	Petra	Ma'ān, Al Urduṅ, Asia, World
tgn:7002205	Takht-e Jamshīd	Fārs, Irān, Asia, World
tgn:7001297	Thebes@en	Qinā, Miṣr, Africa, World
tgn:7032359	Qal'at al 'Ālāj	Al Baḥrayn, Asia, World
tgn:8003070	Choirokotia	Lemesós, Kypriskī Dimokratia, Asia, World
tgn:7012244	Merv	Mary, Türkmenistan, Asia, World
tgn:8000442	Kharā'ib al Ashūrīyīn@ar-latn	Ṣalāḥ ad Dīn, Al-'Irāq, Asia, World
tgn:8000612	Bāmīyān	Bāmīyān, Afghānestān, Asia, World

(cont.) 3. KOS
b. **Getty Vocab**s

Create Microthesauri or pick lists
from the Getty LOD Vocabularies

AAT

Art and Architecture Thesaurus (AAT)

Use a <Guide Term>
to obtain all concept URIs
and preferred terms
in the hierarchies (for a
microthesaurus or a pick list)

in <xyz>

aat:300264447	agere fite@en
aat:300262796	aids to navigation@en
aat:300210466	sigrettes (plumes@en
aat:300181617	airport beacons@en
aat:300181651	airway beacons@en
aat:300263682	akorkromfi@en
aat:300210415	albs@en
aat:300198819	alms dishes@en
aat:300210416	almuces (hoods@en
aat:300263075	aloalo@en
aat:300391092	altar bells@en
aat:300391083	altar candlesticks@en
aat:300262580	altar crosses@en
aat:300198805	altar crutes@en
aat:300075940	altarpieces@en
aat:300264259	alus@en
aat:300210417	amices@en
aat:300198899	ampullae@en
aat:300265565	amulets@en

Microthesaurus = designated subset of a
thesaurus that is capable of functioning as a
complete thesaurus.

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-- ISO25964-2:2013

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Learn by Analyzing

Cases: Using LOD in the LAMs*

1. Special Collections, Archives
 - a. Linked Jazz
 - b. Online Coins of the Roman Empire (OCRE)
2. Bibliographic data
 - WorldCat
3. Knowledge organization systems (KOS) - thesauri, name authorities, and other
 - a. FAST
 - b. Getty Vocab
4. Digital Scholarships
 - VIVO based - Scholars @ Cornell

*LAM = Libraries, archives, and museums

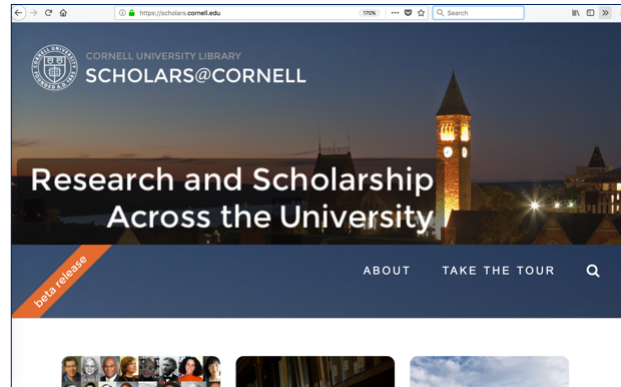
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Scholars @ Cornell

<https://scholars.cornell.edu/>

Scholars@Cornell offers integrated and individualized profiles about:

- faculty,
- institute units, research domains,
- collaborating networks, and
- academic outcomes.



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E.g., Choose one faculty member or researcher

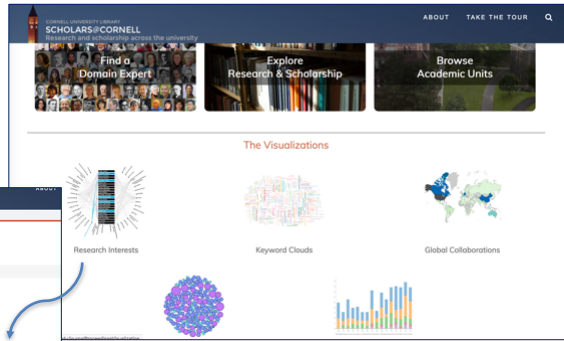
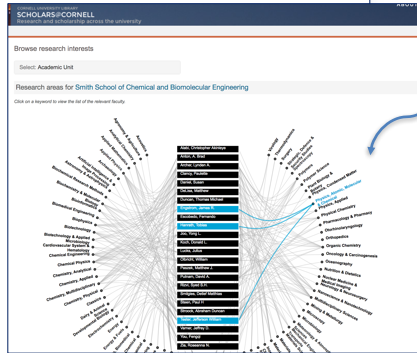
For example, when looking for an information science researcher, I found a professor, Susan R. Fussell.

- What does this profile tell us about this person?

- How are things connected?
"Co-Authors"
"Co-Investigators"

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All interactive. Data values in various ontological classes are connected, integrated.



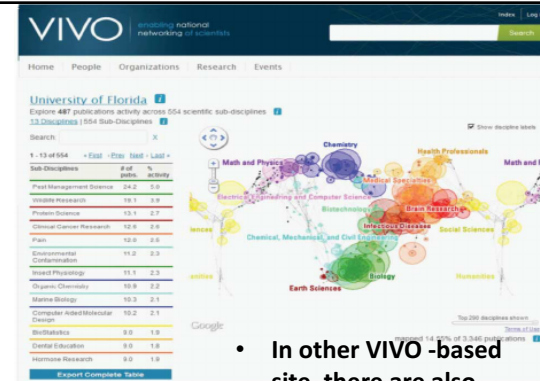
- <https://scholars.cornell.edu/>

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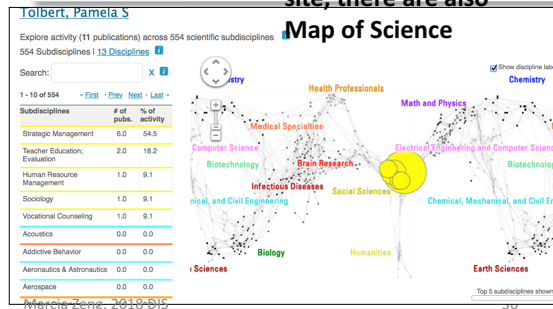
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VIVO (not an acronym) is a well-known ontology-based scholarly networking and discovery tool for managing information and knowledge in large institutions and associations, as demonstrated by the VIVO-powered websites

- e.g.,
- [Scripps Research Institute](#),
- [U.S. Department of Agriculture](#),
- [UNAVCO](#), and
- many others -see registry: <http://duraspace.org/registry/vivo>



- In other VIVO-based site, there are also **Map of Science**



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Summary

The changing concepts

- (seeing from the content)
 - From "Web of Documents" to "Web of Data"
 - From linking strings to linking things
 - From digitization to datalization
- (seeing from the results)
 - From "On the Web" to "Of the Web"

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What is Linked Data?

- -- is a term used to describe a method of exposing, sharing, and connecting data on the Web using URIs and RDF
- --is about:
 - using the Web to connect related data that was not previously linked,
 - using the Web to lower the barriers to linking data currently linked using other methods. [1]

[1] <http://linkeddata.org/>

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