



Lower the Barrier & Be Empowered: Creating and Including Linked Data Vocabularies for Digital Collections

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Digital Repositories and Linked Data

- **STARS** (<https://stars.library.ucf.edu>)
 - UCF's IR; Based on [Digital Commons](#);
 - Allow to add extra fields for LOD links
- **Preparing for Linked Data**
 - Include links (e.g., viaf.org, id.loc.gov, Wikidata) in added additional fields for authors, advisors, college names, subjects etc.;
 - Data cleanup and reconciliation using OpenRefine

Digital Repositories and Linked Data

- **Islandora**

- Effort in mapping MODS to RDF;
- Fedora 4, LDP implementation; [Islandora CLAW](#)

- **Samvera** (previously “Hydra”)

- LDP platform, publication of RDF data;
- Case: [Oregon Digital](#)
 - Migrated from CONTENTdm to Hydra;
 - Created [opaquenamespace](#)

- **CONTENTdm**

- Not inside the system, but work on exported data;
- [Challenges of Mapping Digital Collections Metadata to Schema.org: Working with CONTENTdm](#) (Lampron et. al., 2016)
- OCLC& CONTENTdm Metadata Refinery, transforms CONTENTdm metadata to Linked Data, 2016. Not yet scalable. (Washburn et al., 2016)
- [Linked Data Research - OCLC](#)

Digital Repositories and Linked Data

- **Omeka**

- Open source web publishing platform;
- Supports DC, can export METS, dc-rdf, JSON etc.
- [Ozmeka \(plug-ins\)/ Omeka linked data](#)

- **DSpace**

- **DSpace Linked Data support** spans all three Layers: “the storage layer with a **triple store**, the business logic with classes to **convert** stored contents into RDF, and the application layer with a module to **publish** RDF serializations.” - Donohue. Linked (Open) Data.
(<https://wiki.duraspace.org/display/DSDOC6x/Linked+%28Open%29+Data>)
- [Illuminating DSpace's Linked Data Support](#) (Becker, 2016)

Adding Linked Data Vocabularies to UCF Digital Repositories

- **Adding LOD Links to Fields in Digital Repositories**
 - Authors/Creators
 - Contributors, e.g., thesis advisors
 - Corporate names, e.g., university, college and departmental names
 - Subjects
 - Person identifiers
- **OpenRefine**
 - **Download and installation**
<http://openrefine.org/download.html>
 - **Documentation**
<https://github.com/OpenRefine/OpenRefine/wiki/Documentation-For-Users>
 - **Features**
 - Import
 - Facet
 - Edit cells: Clustering...
 - Edit columns: Add Column based on this column; Fetching URLs from Web Services (*Enrich existing data columns)...
 - Expressions
 - Export
 - History...



Adding Linked Data Vocabularies to UCF Digital Repositories: Cases

- **Cases**

- **Adding LC and VIAF Links to Advisor Names**

- Faceting, clustering, LoC reconciliation, review; add column based on this column, VIAF reconciliation, review

- **Combining Multiple Links for Author Names**

- Expression: General Refine Expression Language (GREL)

- **Adding LC Subject Links to IR Records**

- Splitting, add column based on this column, expression

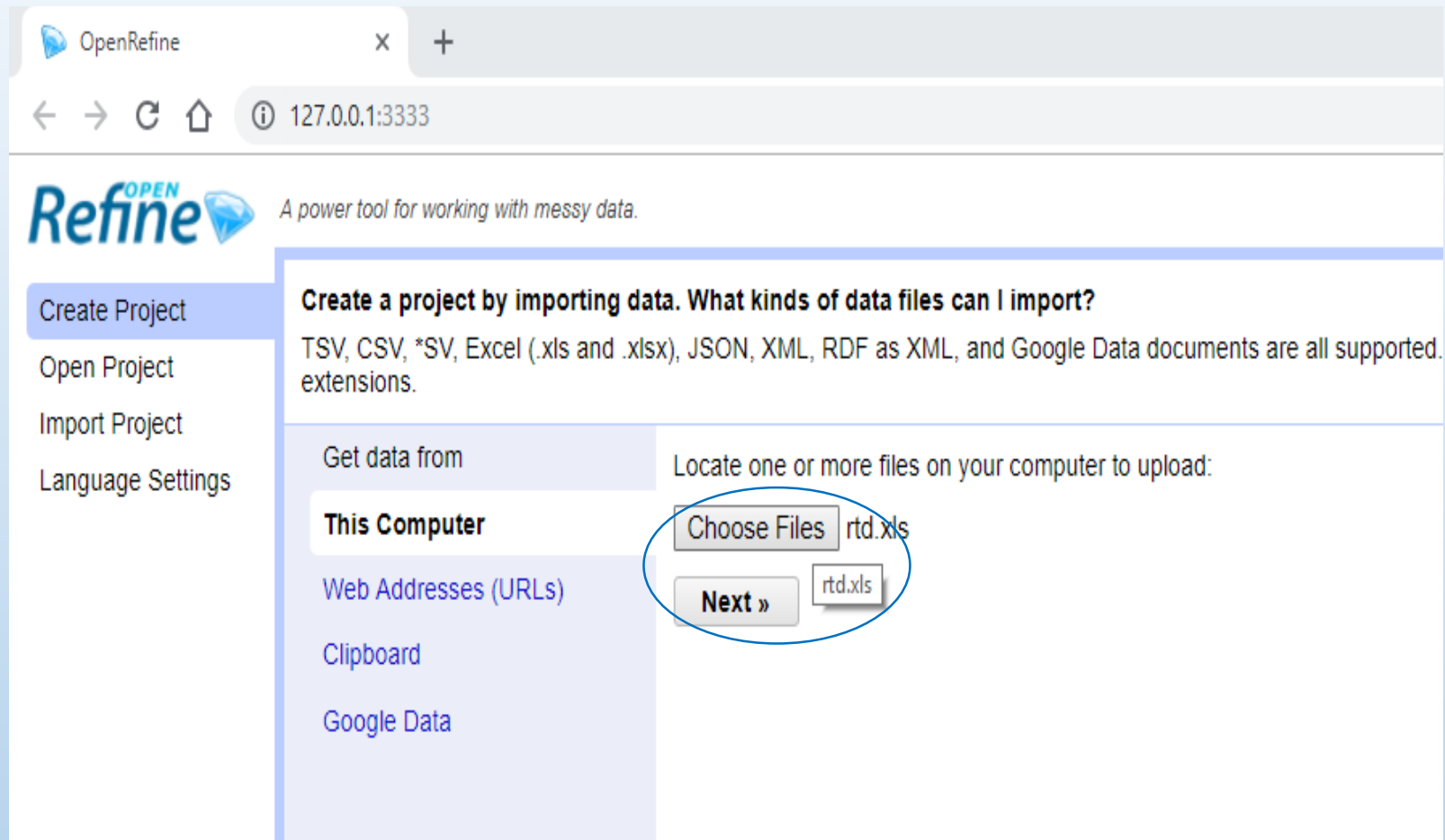
- **Adding FAST Headings by Fetching URLs**

- Add column by fetching URLs, expression, text transformation

- **For step by step instructions, please refer to**

[A Step Forward: Adding Linked Data Vocabularies to Digital Repositories](#)

Adding LC and VIAF Links to Advisor Names



Open OpenRefine — Choose Files — Select rtd.xls — Click “Next”

Adding LC and VIAF Links to Advisor Names

OpenRefine

127.0.0.1:3333

Refine A power tool for working with messy data.

Create Project Start Over Configure Parsing Options Project name: rtd **Create Project »**

Open Project
Import Project
Language Settings

| | title | keywords | disciplines | abstract | notes | publication_date | same |
|----|--|--|--|--|---|----------------------|------|
| 1. | Sector Energy Price and Demand in the State of Florida | Energy consumption -- Florida, Petroleum products -- Prices -- Florida | Business | | <p>If this is your thesis or dissertation, and want to learn how to access it or for more information about readership statistics, contact us at STARS@ucf.edu</p> | 1980-04-01T00:00:00Z | |
| 2. | A Comparison of Articulation Errors of Second Grade Students in Three Speaking Conditions | Articulation disorders in children | Communication Sciences and Disorders; Medicine and Health Sciences; Speech and Hearing Science | | <p>If this is your thesis or dissertation, and want to learn how to access it or for more information about readership statistics, contact us at STARS@ucf.edu</p> | 1981-04-01T00:00:00Z | |
| 3. | A Comparison of /r/ Phoneme Production by Kindergarten Children in Stress-Variied Sentences | Articulation disorders in children | Communication Sciences and Disorders; Medicine and Health Sciences; Speech and Hearing Science | | <p>If this is your thesis or dissertation, and want to learn how to access it or for more information about readership statistics, contact us at STARS@ucf.edu</p> | 1981-04-01T00:00:00Z | |
| 4. | Analysis of a Solar Collector in an Absorption Cycle Including a Pump Operated by Thermoelectric Cells | Solar collectors | Engineering | A mathematical computer model has been developed for the prediction of the thermal performance of a flat-plate solar collector used as the generator for | <p>If this is your thesis or dissertation, and want to learn how to access it or for more information about readership statistics, contact us at STARS@ucf.edu</p> | 1981-04-01T00:00:00Z | |

Parse data as

Excel files

JSON files

Line-based text files

CSV / TSV / separator-based files

Fixed-width field text files

PC-Axis text files

MARC files

RDF/N3 files

XML files

Open Document Format

Worksheets to Import

☒ 7785939 3651 rows

☐ Ignore first 0 line(s) at beginning of file

☒ Parse next 1 line(s) as column headers

☐ Discard initial 0 row(s) of data

☐ Load at most 0 row(s) of data

☒ Store blank rows

☒ Store blank cells as nulls

☐ Store file source (file names, URLs) in each row

Update Preview

Version 2.7 (TRUNK)

Help
About

Click
“Create
Project”

Adding LC and VIAF Links to Advisor Names

Faceting

The screenshot shows the OpenRefine web interface. On the left, the 'Facet / Filter' panel is active, showing a list of 703 choices for the 'advisor1' facet, sorted by name count. A blue circle highlights this list. In the center, a table displays 3650 rows of data with columns: 'location_date', 'semester', 'advisor1', 'Column', 'degree_name', 'college', 'department', and 'degree_program'. A second blue circle highlights the 'advisor1' column header. A right-click context menu is open over the 'advisor1' column header, with the 'Facet' option selected. A third blue circle highlights the 'Text facet' option within this menu. The background table shows data for 'Xander, James A.' with a 'Master of Arts (M.A.)' degree from the 'College of Business Administration'.

First click “Facet – Text facet” (under advisor1)

Adding LC and VIAF Links to Advisor Names

Clustering

The screenshot shows the OpenRefine interface with a project named 'rtd'. The table has 3650 rows. The 'advisor1' column is selected, and the 'Cluster' button is highlighted. The table shows columns for publication_date, semester, advisor1, Column, degree_name, and college. The first row shows 'Xander, James A.' as the advisor.

| publication_date | semester | advisor1 | Column | degree_name | college |
|------------------|----------|-------------------|--------|--------------------------|------------------------------------|
| 0:00Z | | Xander, James A. | | Master of Arts (M.A.) | College of Business Administration |
| 0:00Z | | Bradley, Doris P. | | Master of Arts (M.A.) | College of Health |
| 0:00Z | | Bradley, Doris P. | | Master of Arts (M.A.) | College of Health |
| 0:00Z | | Chang, K.K. | | Master of Science (M.S.) | College of Engineering |

Click “Cluster” on the left, or click “Edit Cells – Cluster and edit” (under “advisor1” column)

Adding LC and VIAF Links to Advisor Names

Clustering

Cluster & Edit column "advisor1"

(Method: key collision,
Keying Function: fingerprint)

e.g.,

Hynes, Michael C. (45 rows)

Hynes, Michael C.

Hynes, michael C. (3 rows)

→ Hynes, Michael C.

Chow, Lee (7 rows)

Chow, Lee

Lee, Chow (1 rows)

→ Chow, Lee

Refine ^{OPEN} rtd Permalink

Facet / Filter Undo / Redo 0 3650 rows

Refresh Reset All Remove All Show as: rows records Show: 5 10 25 50 rows

Cluster & Edit column "advisor1"

This feature helps you find groups of different cell values that might be alternative representations of the same concept and just have capitalization differences, and

Method: key collision Keying Function: fingerprint

| Cluster Size | Row Count | Values in Cluster | Merge? | New Cell Value |
|--------------|-----------|---|--------------------------|--------------------|
| 2 | 48 | <ul style="list-style-type: none">Hynes, Michael C. (45 rows)Hynes, michael C. (3 rows) | <input type="checkbox"/> | Hynes, Michael C. |
| 2 | 8 | <ul style="list-style-type: none">Shah, Mubarak (6 rows)Shah, Mubarak; (2 rows) | <input type="checkbox"/> | Shah, Mubarak |
| 2 | 4 | <ul style="list-style-type: none">Fernandez, Jose B. (3 rows)Fernández, José B. (1 rows) | <input type="checkbox"/> | Fernandez, Jose B. |
| 2 | 16 | <ul style="list-style-type: none">Wayson, Roger L. (15 rows)wayson, Roger L. (1 rows) | <input type="checkbox"/> | Wayson, Roger L. |
| 2 | 8 | <ul style="list-style-type: none">Chow, Lee (7 rows)Lee, Chow (1 rows) | <input type="checkbox"/> | Chow, Lee |

Adding LC and VIAF Links to Advisor Names

Clustering

Cluster & Edit column "advisor1"

Try other algorithms;
Merge Selected & Close

**Might be hard to
determine at early stage:**
Butler, Jeff (8 rows)
Butler, Jeff F. (3 rows)

Gay, David A. (3 rows)
Gay, David (1 rows)
(*Appearance time? Middle
name? What's established?)

Refine OPEN rtd Permalink

Facet / Filter Undo / Redo 1 3650 rows

Refresh Reset All Remove All Show as: rows records Show: 5 10 25 50

✕ advisor1 690 choices

Abdel-Aty, M
Acerno, Lou
Adams, Car
Adams, Car
Adams, Sea
Adams, Sea
Adicks, Rich
Al-Deek, Ha
Ali, Arshad
Allen, Janet
Allen, Kay V
Allen, Kay V
Alsaka, Yac
Alsaka, Yac
An, Linan 2
Anderson, B
Anderson, L
Anderson, L
Anderson, S
Andrews, La
Anthony, Jo
Applegate, B
Applen, J. D
Applen, J. D
Applen, J. D
Armacost, R
Armstrong, J
Armstrong, J

Cluster & Edit column "advisor1"

This feature helps you find groups of different cell values that might be alternative representations of the same concept and just have capitalization difference

Method: key collision Keying Function: ngram-fingerprint Ngram Size: 2

| Cluster Size | Row Count | Values | Merge? | New Cell Value |
|--------------|-----------|--|--------------------------|-----------------------|
| 2 | 4 | <ul style="list-style-type: none">Nnadi, F. N.Nnadi, F.N. (2 rows) | <input type="checkbox"/> | Nnadi, F. N. |
| 2 | 11 | <ul style="list-style-type: none">Butler, Jeff (8 rows)Butler, Jeff F. (3 rows) | <input type="checkbox"/> | Butler, Jeff |
| 2 | 4 | <ul style="list-style-type: none">Gay, David A. (3 rows)Gay, David (1 rows) | <input type="checkbox"/> | Gay, David A. |
| 2 | 2 | <ul style="list-style-type: none">Van Stryland, Eric W. (1 rows)VanStryland, Eric W. (1 rows) | <input type="checkbox"/> | Van Stryland, Eric W. |
| 2 | 2 | <ul style="list-style-type: none">Applen, J. D. (1 rows)Applen, J.D. (1 rows) | <input type="checkbox"/> | Applen, J. D. |
| 2 | 7 | <ul style="list-style-type: none">Moharam, M. G. (6 rows)Moharam, M.G. (1 rows) | <input type="checkbox"/> | Moharam, M. G. |

Adding LC and VIAF Links to Advisor Names

Reconciliation

The screenshot shows the Refine interface with a table of 3650 rows. The 'Reconcile' menu is open, and 'Start reconciling...' is highlighted. The background table has the following columns: semester, advisor1, degree_name, college, department, degree_program. The 'advisor1' column is selected, and the 'Reconcile' menu is open, showing options like 'Start reconciling...', 'Extract named entities...', 'Facets', 'QA facets', 'Actions', 'Copy reconciliation data...', and 'Discover related RDF datasets...'. The 'Start reconciling...' option is circled in blue.

| semester | advisor1 | degree_name | college | department | degree_program |
|----------|---------------------------|-----------------------|------------------------------------|------------|-------------------------|
| | Facet | Master of Arts (M.A.) | College of Business Administration | | Applied Economics |
| | Text filter | | | | |
| | Edit cells | | | | |
| | Edit column | | | | |
| | Transpose | Master of Arts (M.A.) | College of Health | | Communicative Disorders |
| | Sort... | | | | |
| | View | | | | |
| | Reconcile | | | | |
| | Extract named entities... | | | | |
| | Chang, K.K. | (M.S.) | Engineering | | |

Sort by
advisor;

Click
“Reconcile—
Start
reconciliation”

Adding LC and VIAF Links to Advisor Names

← → ↺ ↻ 127.0.0.1:3333/project?project=2122028945939

Refine advisors_RTDs.xlsx Permalink

Facet / Filter Undo / Redo 5 968 rows Extensions: Named-entity re

Refresh Reset All Remove All Show as: rows records Show: 5 10 25 50 rows Sort ▼

« first « previous

Choose Reconciliation Service:
Need to set up the service first

Reconcile column "advisor"

Services

- NamedEntity
- Wikidata Reconciliation for OpenRefine (en)
- VIAF
- LC (by way of VIAF)
- ORCID
- Open Library
- LoC Reconciliation Service**
- Virtual International Authority File
- Sindice
- LCSH
- VIAF - LC

Pick a Service or Extension on Left

How to set up LoC Reconciliation Service
Click "Add Standard Service";

Enter the service's URL:

<https://lc-reconcile.herokuapp.com/>

Add Service **Cancel**

Add Standard Service... Start Reconciling Cancel

Adding LC and VIAF Links to Advisor Names

Reconciliation

Refine **OPEN** rtd Permalink

Facet / Filter Undo / Redo 6 3650 rows

Refresh Reset All Remove All Show as: rows records

Reconcile column "advisor1"

Reconcile each cell to an entity of one of these types:

- ☒ Names
- ☐ Subjects
- ☐ LoC

614 choices Sort by: [icon]

Abdel-Aty, Mohamed A. 12
Acierno, Louis J. 2
Adams, Carole E. 4
Adams, Sean P. 4
Adicks, Richard R. 1
Al-Deek, Haitham M. 18
Ali, Arshad 1
Allen, Janet S. 2
Allen, Kay W. 3
Allen, Kay Williamson 5
Alkhalifa, Yousuf A. 16

Leave “Names” as default;
Click “Start Reconciling”

Refine **OPEN** rtd Permalink

Facet / Filter Undo / Redo 7 3650 rows

Refresh Reset All Remove All Show as: rows records Show: 5 10 25 50 rows

advisor1 change 614 choices Sort by: name count Cluster

Abdel-Aty, Mohamed A. 12
Acierno, Louis J. 2
Adams, Carole E. 4
Adams, Sean P. 4
Adicks, Richard R. 1
Al-Deek, Haitham M. 18
Ali, Arshad 1
Allen, Janet S. 2
Allen, Kay W. 3
Allen, Kay Williamson 5
Alkhalifa, Yousuf A. 16

advisor1: judgment change 2 choices Sort by: name count

matched 1549
none 2101

Facet by choice counts

| education_date | semester | advisor1 | Column | degree_name |
|----------------|----------|--|--------|--------------------------|
| 1900Z | | Hedrick, Dona Lea Choose new match | | Master of Arts (M.A.) |
| 1900Z | | Whitehouse, Gary E. [x] Whitehouse, Gary E., 1938- (87) [x] Create new topic | edit | Master of Science (M.S.) |

Matched 1549
(about 42.44%).

Adding LC and VIAF Links to Advisor Names

OpenRefine interface showing a project named "Adams, Sean P. - LC Linked Data". The interface displays a facet on "advisor1" with 614 choices. The selected row is "Adams, Sean P." (highlighted in orange). The main table shows 4 matching rows (3650 total) for the selected row. The table columns are semester, advisor1, degree_name, college, and department. The first row shows "Adams, Sean P." as the advisor, a Master of Arts (M.A.) degree, from the College of Arts and Sciences, in the History department.

- For names linked, click the **name** to check;
- If it's not the right person, click "Choose new match" for other options.

Adams, Sean P.

URI(s) <http://id.loc.gov/authorities/names/n92070159>

Sources

found: Letters from the front, 1898-1945, 1992:CIP t.p. (Sean P. Adams)

found: Old Dominion, industrial commonwealth coal, politics, and economy in antebellum America, 2004:ECIP t.p. (Sean Patrick Adams) dataview (b. 1969; Department of History, Univ. of Central Fla.)

Adding LC and VIAF Links to Advisor Names

Review

3 matching rows (3650 total)

Show as: **rows** records Show: 5 10 25 **50** rows

| <input type="checkbox"/> advisor1 | <input type="checkbox"/> degree_name | <input type="checkbox"/> college | <input type="checkbox"/> department | <input type="checkbox"/> degree_progr |
|--|--------------------------------------|----------------------------------|-------------------------------------|---------------------------------------|
| Chase, Diane | edit | Master of Arts (M.A.) | College of Arts and Sciences | Liberal Studies |
| <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Chase, Diane (100) | | | | |
| <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Chase, Diane Z. (92) | | | | |
| <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Chase, Diane, 1947- (81) | | | | |
| <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Create new topic | | | | |

- **For names unlinked,** click the options below to check;
- If it's the right person, click ✓ (apply to this cell only) or ✓✓ (apply to all identical cells) to apply.
- **If no right name found,** click "Create new topic";
- Input the right name and apply.

Click the link under "Chase, Diane Z.", it opens:

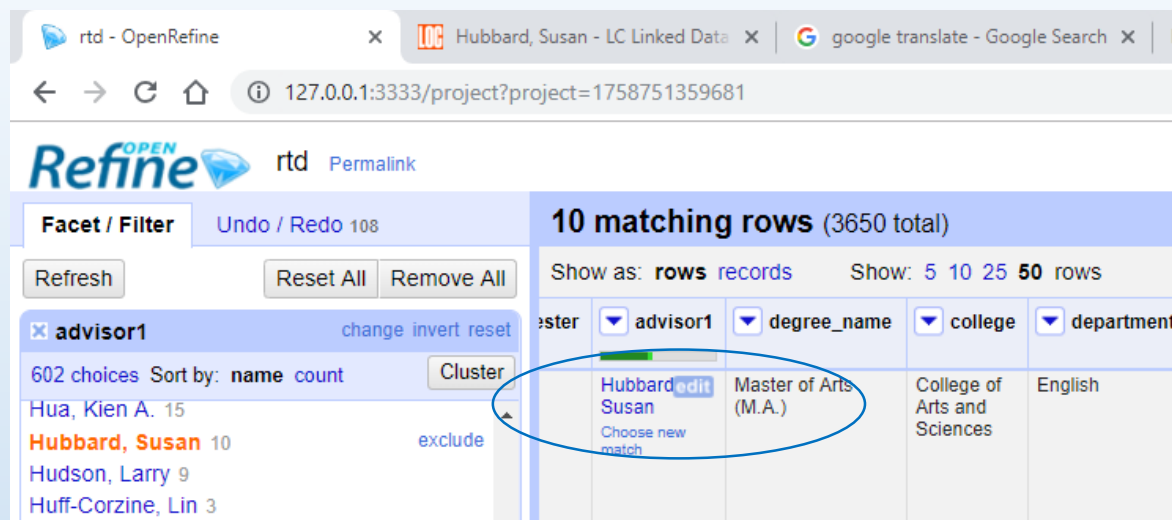
<http://id.loc.gov/authorities/names/n89612783>

Sources

found: nuc89-21890: Her Offerings to the gods, 1986(hdg. on DDO rept.: Chase, Diane Z.; usage: Diane Z. Chase)

found: Her A postclassic perspective, 1988:t.p. (Diane Zaino Chase) p. 1 ([Univ. of Central Florida](#))

Adding LC and VIAF Links to Advisor Names



OpenRefine interface showing a project with 10 matching rows (3650 total). The interface includes a Facet/Filter section on the left, a main table with columns for advisor1, degree_name, college, and department, and a right sidebar with a list of choices for each column. The 'advisor1' column is selected, and a list of 602 choices is shown. The top choice is 'Hubbard, Susan' with 10 occurrences. The 'degree_name' column is also selected, and a list of choices is shown. The top choice is 'Master of Arts (M.A.)' with 10 occurrences. A blue circle highlights the 'Hubbard, Susan' row in the 'advisor1' column.

Review

- Can be time-consuming;
- **Determining factors:** name form, institution, field, book/work info, birth place, year...
- When LCNAF doesn't provide enough information, further check the web;
- When confirmed that it's the right person, click ✓ or ✓✓ to apply.

Hubbard, Susan

URI(s) <http://id.loc.gov/authorities/names/n88050761>

Sources

found: Her Is repeating a grade a sign of failure? 1988:p. 6...

found: Phone call to S. Hubbard 5-14-90(Susan Hubbard, author of Is repeating a grade ... is the same person; **b. 9-6-51**)

[Hubbard, Susan 1951- \(Susan Mary Hubbard\)](#) (Encyclopedia)

Born September 6, 1951, in Syracuse, NY... *Home*—Winter Park, FL. *Office*—Department of English, University of Central Florida

Adding LC and VIAF Links to Advisor Names

Lillios, Anna, 1948-

URI(s) <http://id.loc.gov/authorities/names/n2003044537>

Sources

found: [Lawrence Durrell and the Greek world](#),
c2004:EDCIP t.p. (Anna Lillios) data view (b. 3/13/48)

Google books: [Lawrence Durrell and the Greek World](#)

About the author (2004)

Anna Lillios, [associate professor of English at the University of Central Florida](#), is the editor of the "Marjorie Kinnan Rawlings Journal of Florida Literature"...

Lue, Martha Scott

URI(s) <http://id.loc.gov/authorities/names/n00091486>

Sources

found: Lue, Martha Scott. [A survey of communication disorders for the classroom teacher](#), 2000:CIP t.p.
(Martha Scott Lue)

[CV in UCF Website](#): Martha S. Lue Stewart

Lue (Stewart), M.S. (2001). [A survey of communication disorders for the classroom teacher](#). NY: Pearson.

Review

- What can be checked:
 - Google
 - Wikipedia
 - Amazon books
 - Publisher site
 - Obituaries
 - University website
 - Publications
 - CVs
 - Encyclopedia
 - Newsletter
 - Archives
 - ...

Adding LC and VIAF Links to Advisor Names

Add Column for URLs

- Edit column—Add column based on this column (under advisor1)
- In the opened new window, fill in:
New column name: advisor1_lc
Expression: cell.recon.match.id

3650 rows Extensions:

Show as: rows records Show: 5 10 25 50 rows

semester advisor1 degree_name college department degree_program

Add column based on column advisor1

New column name: advisor1_lc

☒ set to blank ☐ store error ☐ copy value from original column

Expression: cell.recon.match.id Language: General Refine Expression Language (GREL) No syntax error.

Preview History Starred Help

| | | |
|-----|----------------------------|---|
| 18. | Wehr, Paul (Paul W.) | http://id.loc.gov/authorities/names/n83208149 |
| 19. | Xander, James A. | Error: Cannot retrieve field from null |
| 20. | Hedrick, Dona Lea | http://id.loc.gov/authorities/names/no00040043 |
| 21. | Whitehouse, Gary E., 1938- | http://id.loc.gov/authorities/names/n85146525 |
| 22. | Armstrong, Lee H. | http://id.loc.gov/authorities/names/n79131864 |
| 23. | Gupton, John T. | Error: Cannot retrieve field from null |
| 24. | Metwalli, Sayed M. | Error: Cannot retrieve field from null |
| 25. | Pryor, Burt | Error: Cannot retrieve field from null |

OK Cancel

Facet / Filter Undo / Redo 424

Refresh Reset All Remove All

advisor1 578 choices Sort by: name count Cluster

| advisor1 | advisor1_lc | degree_name |
|----------------------------|---|--------------------------|
| Hedrick, Dona Lea | http://id.loc.gov/authorities/names/no00040043 | Master of Arts (M.A.) |
| Whitehouse, Gary E., 1938- | http://id.loc.gov/authorities/names/n85146525 | Master of Science (M.S.) |

LC links added to the data sheet

Adding LC and VIAF Links to Advisor Names

Add VIAF Links

Add a duplicate column for advisor1: advisor1_c.

Add a column based on advisor1_c:

New column name advisor1_viaf
Expression

"https://viaf.org/viaf/" + cell.recon.match.id

[advisor1_viaf] Reconciliation
Select **VIAF-LC Reconciliation Service** (Check LC names only)
(*or Virtual International Authority File service)

3650 rows Extensions: Named-entity recognition RDF

Show as: rows records Show: 5 10 25 50 rows « first < previous 1 - 50 next > last »

| semester | advisor1 | advisor1_c | advisor1_lc | degree_name | college |
|----------|---|---|---|--------------------------|------------------------|
| | Whitehouse, Gary E., 1938- <small>Choose new match</small> | Whitehouse, Gary E., 1938- <small>Choose new match</small> | http://id.loc.gov/authorities/names/n85146525 | Master of Science (M.S.) | College of Engineering |

Add column based on column advisor1_c

New column name: advisor1_viaf

☒ set to blank ☐ store error ☐ copy value from original column

Expression: "https://viaf.org/viaf/" + cell.recon.match.id Language: General Refine Expression Language (GREL) No syntax error.

Preview History Starred Help

| | | |
|-----|----------------------------|---|
| 15. | Pryor, Burt | https://viaf.org/viaf/75893781 |
| 16. | Eno, Burton E. | https://viaf.org/viaf/23561002 |
| 17. | Fisher, Randy D. | Error: Cannot retrieve field from null |
| 18. | Wehr, Paul (Paul W.) | https://viaf.org/viaf/6317806 |
| 19. | Xander, James A. | Error: Cannot retrieve field from null |
| 20. | Hedrick, Dona Lea | https://viaf.org/viaf/14313884 |
| 21. | Whitehouse, Gary E., 1938- | https://viaf.org/viaf/92873903 |
| 22. | Armstrong, Lee H. | https://viaf.org/viaf/6219593 |

How to set up VIAF-LC Reconciliation Service

Click "Add Standard Service";

Enter the service's URL: <http://refine.codefork.com/reconcile/viaf/LC>

How to set up Virtual International Authority File service

Enter the service's URL: http://iphylo.org/~rpage/phyloinformatics/services/reconciliation_viaf.php

Adding LC and VIAF Links to Advisor Names

Combine Values

Using Expression to Format Multiple Links

- Add column based on this column
 - New column name advisor1_viaf_lc
 - Expression

If there are no blank cells:

```
cells["author1_viaf"].value + " " +  
cells["author1"].value + "[VIAF] " +  
cells["author1_lc"].value + " " +  
cells["author1_c"].value + "[LC]"
```

If there are blank cells:

```
if(isBlank(cells["advisor1_viaf"].value), " ",  
cells["advisor1_viaf"].value) + " " +  
if(isBlank(cells["advisor1_c"].value), " ",  
cells["advisor1_c"].value) + " " +  
"[VIAF] " +  
if(isBlank(cells["advisor1_lc"].value), " ",  
cells["advisor1_lc"].value) + " " +  
if(isBlank(cells["advisor1"].value), " ",  
cells["advisor1"].value) + " " +  
"[LC]"
```

3650 rows Extensions: Named-entity recognition

Show as: rows records Show: 5 10 25 50 rows

| advisor1 | advisor1_c | advisor1_viaf | advisor1_lc |
|--|--|---|---|
| Whitehouse, Gary E., 1938- Choose new match | Whitehouse, Gary E., 1938- Choose new match | https://viaf.org/viaf/92873903 | http://id.loc.gov/authorities/names/n85146525 |

Add column based on column advisor1

New column name advisor1_viaf_lc

☐ set to blank ☐ store error ☒ copy value from original column

Expression `if(isBlank(cells["advisor1_viaf"].value), " ", cells["advisor1_viaf"].value) + " " + if(isBlank(cells["advisor1_c"].value), " ", cells["advisor1_c"].value) + " " +` Language General Refine Expression Language (GREL) No syntax error.

Preview History Starred Help

| | |
|--------------------------------|---|
| 37. Whitehouse, Gary E., 1938- | https://viaf.org/viaf/92873903 Whitehouse, Gary E., 1938- [VIAF] |
| 38. Bollinger, Rick L. | https://viaf.org/viaf/58191117 Bollinger, Rick L. [VIAF] |
| 39. Cottrell, Larry K. | Cottrell, Larry K. [VIAF] Cottrell, Larry K. [LC] |
| 40. Fernández, José B. | Fernández, José B. [VIAF] http://id.loc.gov/authorities/names/n2018029713 Fernández, José B. [LC] |
| 41. Hosler, E. | Hosler, E. Ramon [VIAF] Hosler, E. Ramon [LC] |

Show as: rows records Show: 5 10 25 50 rows

| advisor1 | advisor1_viaf_lc |
|--|--|
| Whitehouse, Gary E., 1938- Choose new match | https://viaf.org/viaf/92873903 Whitehouse, Gary E., 1938- [VIAF] http://id.loc.gov/authorities/names/n85146525 Whitehouse, Gary E., 1938- [LC] |

An Example in the IR (with VIAF/LC links)

STARS Citation

Wijeratne, Kolonne A., "An Industrial Wastewater Treatment Review for the Textile and Pulp and Paper Industries of Srilanka" (1976). *Retrospective Theses and Dissertations*. 266.

<https://stars.library.ucf.edu/rtd/266>

Contributor (Linked data)

[McLellon, Waldron M.](#) [VIAF]

[McLellon, Waldron M.](#) [LC]

[University of Central Florida. College of Engineering](#) [VIAF]

[University of Central Florida. College of Engineering](#) [LC]

Collection (Linked data)

[Retrospective Theses and Dissertations](#)

**LOD links
added for:**
Advisor name
College name

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[Privacy](#) [Copyright](#)

<https://stars.library.ucf.edu/rtd/266/>

Adding Locally Created Wikidata for RTDs

- Wikidata is created for local terms.

STARS Citation

Howerton, Peggie A., "Path to chaos : excess, absence and anarchy in Tennyson's Idylls of the King" (1993). *Retrospective Theses and Dissertations*. 3669.

<https://stars.library.ucf.edu/rtd/3669>

Contributor (Linked data)

[Richard R. Adicks \(Q57704630\)](#)

STARS Citation

Risher, Thomas Alan, "A Computer Graphics Analysis of a Freeway Merge Control System" (1976). *Retrospective Theses and Dissertations*. 251.

<https://stars.library.ucf.edu/rtd/251>

Contributor (Linked data)

[Christian S. Bauer, Jr. \(Q57708477\)](#)

[University of Central Florida. College of Engineering \[VIAF\]](#)

[University of Central Florida. College of Engineering \[LC\]](#)

Collection (Linked data)

[Retrospective Theses and Dissertations](#)

LOD links added for
Advisor name, e.g.,

Richard R.

Adicks (Q57704630)

<https://www.wikidata.org/wiki/Q57704630>

<https://stars.library.ucf.edu/rtd/3669/>



<https://stars.library.ucf.edu/rtd/251/>

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Adding Locally Created Wikidata for RTDs



Main page
Community portal
Project chat
Create a new Item
Create a new Lexeme
Recent changes
Random item
Query Service
Nearby
Help
Donate

Tools
What links here
Related changes
Special pages
Permanent link
Page information
Concept URI
Cite this page

Item Discussion

Read View history

Search Wikidata

Richard R. Adicks (Q57704630)

Professor Emeritus of English, University of Central Florida

Adicks, Richard R. | Richard Adicks | Adicks, Richard

▼ In more languages Configure

| Language | Label | Description | Also known as |
|---------------------|-------------------|--|--|
| English | Richard R. Adicks | Professor Emeritus of English, University of Central Florida | Adicks, Richard R Richard Adicks Adicks, Richard |
| Welsh | No label defined | No description defined | |
| Spanish | No label defined | No description defined | |
| Traditional Chinese | No label defined | No description defined | |

All entered languages

Statements

instance of

human

▼ 0 references

edit

+ add reference

+ add value

sex or gender

male

▼ 0 references

edit

+ add reference

+ add value

given name

Richard

▼ 0 references

edit

+ add reference

+ add value

Create a new Item

Language:

en

Label:

enter a label in English

Description:

enter a description in English

Aliases, pipe-separated:

enter some aliases in English

Create

Create a new Item

**Richard R.
Adicks (Q57704630)**
<https://www.wikidata.org/wiki/Q57704630>

**Statements
Properties**
[instance of](#)
[sex or gender](#)
[given name](#)

...

Adding Locally Created Wikidata for RTDs

| | |
|----------------|---|
| family name | <div><div><div><div><div></div><div>Adicks</div></div></div><div><div><div></div><div>edit</div></div></div></div><div><div>▼ 0 references</div><div><div>+ add reference</div><div>+ add value</div></div></div></div> |
| place of birth | <div><div><div><div><div></div><div>Lake City</div></div></div><div><div><div></div><div>edit</div></div></div></div><div><div>► 1 reference</div><div><div>Lake City</div><div>▼ 1 reference</div><div>reference URL</div></div><div><div>https://www.legacy.com/obituaries/orlandosentinel/obituary.aspx?n=richard-adicks&pid=175526324</div></div></div></div> |
| date of death | <div><div><div><div><div></div><div>15 August 201</div></div></div><div><div><div></div><div>edit</div></div></div></div><div><div>► 1 reference</div><div><div>+ add value</div></div></div></div> |
| place of death | <div><div><div><div><div></div><div>Lakeland</div></div></div><div><div><div></div><div>edit</div></div></div></div><div><div>► 1 reference</div><div><div>+ add value</div></div></div></div> |
| occupation | <div><div><div><div><div></div><div>university teacher</div></div></div><div><div><div></div><div>edit</div></div></div></div><div><div>▼ 0 references</div><div><div>+ add reference</div><div>+ add value</div></div></div></div> |
| field of work | <div><div><div><div><div></div><div>English</div></div></div><div><div><div></div><div>edit</div></div></div></div><div><div>▼ 0 references</div><div><div>+ add reference</div><div>+ add value</div></div></div></div> |

**Richard R.
Adicks (Q57704630)**

Statements

...

[family name](#)

[place of birth](#)

[date of death](#)

[place of death](#)









[occupation](#)

[field of work](#)

...

Property Reference

Adding Locally Created Wikidata for RTDs

| | |
|-----------------|--|
| employer | <div><div> University of Central Florida</div><div>edit</div></div> <div>0 references</div> <div>+ add reference</div> |
| | <div><div> Rollins College</div><div>edit</div></div> <div>1 reference</div> |
| | <div><div> Georgia Institute of Technology</div><div>edit</div></div> <div>1 reference</div> |
| | + add value |
| award received | <div><div> UCF Faculty Excellence in Teaching Award</div><div>edit</div></div> <div>1 reference</div> |
| | + add value |
| educated at | <div><div> Tulane University</div><div>1 reference</div></div> |
| academic degree | <div><div> Doctor of Philosophy</div><div>0 references</div></div> |
| notable work | <div><div> A Court for Owls</div><div>1 reference</div></div> <div><div> Oviedo: Biography of a Town</div><div>1 reference</div></div> |

Oviedo: Biography of a Town (Q57705146)

Book by Richard Adicks

[In more languages](#) [Configure](#)

| Language | Label | Description |
|---------------------|-----------------------------|------------------------|
| English | Oviedo: Biography of a Town | Book by Richard Adicks |
| Welsh | No label defined | No description defined |
| Spanish | No label defined | No description defined |
| Traditional Chinese | No label defined | No description defined |

Statements

instance of

 written work

[0 references](#)

**Richard R.
Adicks (Q57704630)**

**Statements
Properties**

...

[employer](#)
[award received](#)
[educated at](#)
[academic degree](#)
[notable work](#)

Book Name

[instance of](#) [written work](#)

**written
work (Q47461344)**

[subclass of](#) [work](#)

Linked to External Wikidata

STARS Citation

Lefforge, Andrea, "Analysis of the Public Service Employment Targeting Objectives of Florida" (1980). *Retrospective Theses and Dissertations*. 499.

<https://stars.library.ucf.edu/rtd/499>

Contributor (Linked data)

[Hosni, Djehane, A. \[VIAF\]](#)

[Hosni, Djehane, A. \[LC\]](#)

[University of Central Florida. College of Business Administration \(Q7895232\)](#)

Collection (Linked data)

[Retrospective Theses and Dissertations](#)

The screenshot shows the Wikidata page for the University of Central Florida. College of Business Administration (Q7895232). The page includes a sidebar with navigation links, a main content area with a description table, and a statements section. The description table lists the entity in various languages (English, Welsh, Spanish, Traditional Chinese) with labels and descriptions. The statements section shows the entity is an instance of a business school, located in Orlando, Florida, and has an official website at http://www.bus.ucf.edu/. The page also includes a coordinate location map and a list of identifiers (Quora topic ID, Wikipedia, Wikibooks, Wikinews, Wikiquote, Wikisource, Wikiversity, Wikivoyage).

| Language | Label | Description | Also known as |
|---------------------|--|------------------------|---------------|
| English | University of Central Florida. College of Business Administration | No description defined | |
| Welsh | No label defined | No description defined | |
| Spanish | No label defined | No description defined | |
| Traditional Chinese | No label defined | No description defined | |

Statements

- Instance of: business school (0 references)
- Location: Orlando, Florida (1 reference)
- Official website: http://www.bus.ucf.edu/ (1 reference)
- Identifiers: University-of-Central-Florida-College-of-Business-Administration (1 reference)

Identifiers

- Quora topic ID: University-of-Central-Florida-College-of-Business-Administration (1 reference)
- Wikipedia: University of Central Florida College of Business Administration (1 entry)
- Wikibooks: (0 entries)
- Wikinews: (0 entries)
- Wikiquote: (0 entries)
- Wikisource: (0 entries)
- Wikiversity: (0 entries)
- Wikivoyage: (0 entries)

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[Privacy](#) [Copyright](#)

<https://stars.library.ucf.edu/rtd/499/>

**University of Central Florida. College of
Business Administration (Q7895232)**

<https://www.wikidata.org/wiki/Q7895232>

Wikidata/VIAF/LC Links in the Record

- A Special Example with Multiple LOD Links: Wikidata, VIAF, LC

STARS Citation

Chitsaz, Bijan, "Computerized Displacement Data Analysis in Laser Speckle Photography" (1985). *Retrospective Theses and Dissertations*. 4818.

<https://stars.library.ucf.edu/rtd/4818>

Contributor (Linked data)

[Faissal A. Moslehy \(Q59495035\)](#)

[Moslehy, Faissal Abdel Haleem](#) [VIAF]

[Moslehy, Faissal Abdel Haleem](#) [LC]

[University of Central Florida. College of Engineering](#) [VIAF]

[University of Central Florida. College of Engineering](#) [LC]

LOD links
added for:
Advisor name
College name


[Home](#) | [About](#) | [FAQ](#) | [My Account](#) | [Accessibility Statement](#)

[Privacy](#) [Copyright](#)

<https://stars.library.ucf.edu/rtd/4818/>

*Normally we only create Wikidata entries for names that are not in the VIAF or LC database.

Local Wikidata Record Linked to VIAF/LC



WIKIDATA

- Main page
- Community portal
- Project chat
- Create a new Item
- Create a new Lexeme
- Recent changes
- Random item
- Query Service
- Nearby
- Help
- Donate

Tools

- What links here
- Related changes
- Special pages
- Permanent link
- Page information
- Concept URI
- Cite this page

ItemDiscussionReadView historySearch Wikidata

Faissal A. Moslehy (Q59495035)

Professor of Mechanical Engineering, University of Central Florida edit

Moslehy, Faissal A. | Moslehy, Faissal | Faissal Moslehy | Moslehy, Faissal Abdel Haleem | Moslehy, F. A. | Moslehy, F. A. (Faissal Abdel) | F. A. Moslehy | Faissal Abdel Haleem Moslehy

▼ In more languages Configure

| Language | Label | Description | Also known as |
|----------|--------------------|--|---|
| English | Faissal A. Moslehy | Professor of Mechanical Engineering, University of Central Florida | Moslehy, Faissal A. Moslehy, Faissal Faissal Moslehy Moslehy, Faissal Abdel Haleem |

All entered languages

Statements

instance of

hu

▼

sex or gender

m

▼

given name

Fa

family name

Moslehy

▼ 0 references

+ add reference

+ add value

occupation

university teacher

▼ 0 references

+ add reference

+ add value

field of work

engineering

► 1 reference

+ add value

employer

University of Central Florida

▼ 0 references

+ add reference

+ add value

member of

American Society of Mechanical Engineers

► 1 reference

International Association for Boundary Element Methods 1

► 1 reference

+ add value

award received

UCF Teaching Incentive Program Award

► 1 reference

UCF Excellence in Professional Service Award

► 1 reference

**Faissal A.
Moslehy (Q59495035)**

Statements

- [instance of](#)
- [sex or gender](#)
- [given name](#)
- [family name](#)
- [occupation](#)
- [field of work](#)
- [employer](#)
- [member of](#)
- [award received](#)
- [educated at](#)
- [academic degree](#)
- [official website](#)

Local Wikidata Record Linked to VIAF/LC

| Identifiers | | |
|----------------------------------|--------------------------------------|--|
| VIAF ID | 96900524 ▼ 0 references | edit + add reference + add value |
| Library of Congress authority ID | n82027354 ▼ 0 references | edit + add reference + add value |
| ISNI | 0000 0000 6895 0732 ▶ 1 reference | edit + add value + add statement |

Identifiers

[VIAF ID](#)

[Library of Congress authority ID](#)

[ISNI](#)

| | | |
|------|--------------------------------------|---|
| ISNI | 0000 0000 6895 0732 ▼ 1 reference | edit |
| | VIAF ID | 96900524 |
| | reference URL | http://viaf.org/viaf/96900524 |
| | stated in | Virtual International Authority File |
| | | + add reference + add value |

Reference

[stated in](#)

[VIAF ID](#)

[reference URL](#)

Querying Wikidata

Wikidata Query Service

Examples Help Tools

English

Query Helper

+ Filter

employer University of Central Florida

occupation university teacher

+ Show

field of work

sex or gender

Limit 180

```
1 SELECT ?University_of_Central_Florida ?University_of_Central_FloridaLabel ?field
2 SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE],en
3 ?University_of_Central_Florida wdt:P108 wd:Q143451.
4 ?University_of_Central_Florida wdt:P106 wd:Q1622272.
5 OPTIONAL { ?University_of_Central_Florida wdt:P101 ?field_of_work. }
6 OPTIONAL { ?University_of_Central_Florida wdt:P21 ?sex_or_gender. }
7 }
8 LIMIT 180
```

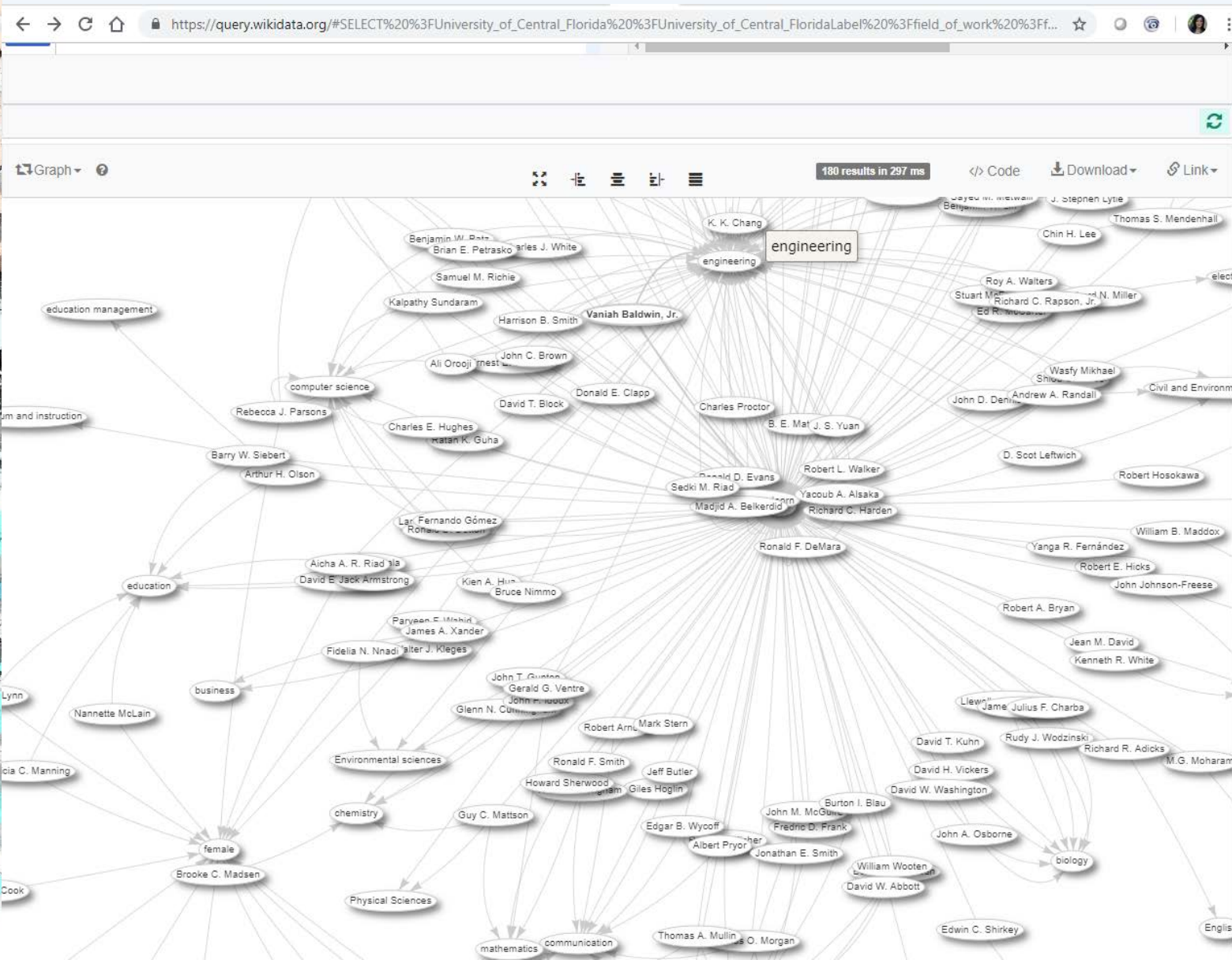
[Wikidata Query Service](#)



180 results in 297 ms

Code Download Link

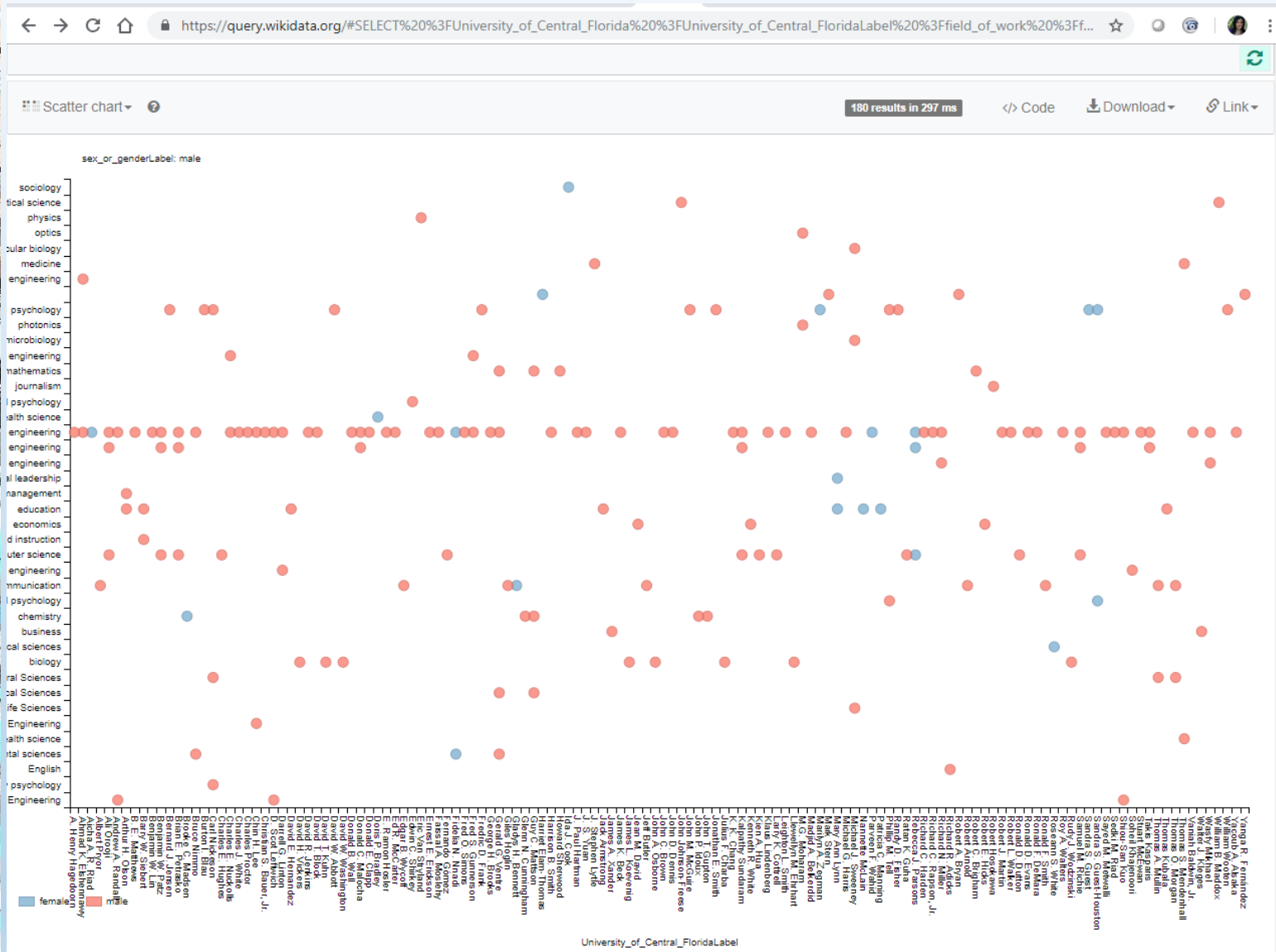
| University_of_Central_Florida | University_of_Central_FloridaLabel | field_of_work | field_of_workLabel | sex_or_gender | sex_or_genderLabel |
|-------------------------------|------------------------------------|------------------------|--------------------|--------------------------|--------------------|
| Q57978539 | Larry K. Cottrell | Q21198 | computer science | Q6581097 | male |
| Q57978729 | Glenn N. Cunningham | Q2329 | chemistry | Q6581097 | male |
| Q57978898 | Jean M. David | Q8134 | economics | Q6581097 | male |
| Q57978987 | Ronald F. DeMara | Q11023 | engineering | Q6581097 | male |
| Q57982750 | John D. Dennis | Q11023 | engineering | Q6581097 | male |
| Q57982795 | Ronald D. Dutton | Q21198 | computer science | Q6581097 | male |
| Q57982886 | Llewellyn M. Ehrhart | Q420 | biology | Q6581097 | male |
| Q57983075 | Ahmad K. Elshennawy | Q11023 | engineering | Q6581097 | male |



Graph:
...University
Teachers,
Gender and
Fields

*The data pool is very small. Not representative as of now.

Querying Wikidata: Graphical Presentations



Scatter Chart:
...University Teachers, Gender and Fields

*The data pool is very small. Not representative as of now.

Discussion

- **Possible Ways to Get Involved with Linked Data**

- Be aware of what's going on, attend webinars/trainings;
- Be an advocate of open data;
- Help researchers to understand linked data, use open data and linked data to support research;
- Promote linked data and identity management (e.g., ORCID);
- Collaborate and contribute to linked data projects when possible, e.g., add LOD links to enrich records information...

- **Recommended Wikidata Practices for Libraries to be Determined**

- Creating local authority records using Wikidata platform is a low barrier linked data practice;
 - For terms already in the national or international authority databases, is it better for local libraries not to add Wikidata entries even they can be linked to VIAF/LC and additional information is available? (What about OCLC's Wikibase experiment?)
 - If Wikidata entries are added by libraries for terms already in the VIAF/LC authority database, should we wait for the Wikidata's identifiers/external links (e.g., VIAF/LC/ISNI etc.) to be imported by national efforts?
 - What's the current status in authority control with various methods by different entities?
- For us, we will continue to explore OpenRefine, Wikidata and related services to enrich metadata and improve workflow for our digital collections.

Resources

- Berners-Lee, Tim. Linked data. <https://www.w3.org/DesignIssues/LinkedData.html>
- Becker (2016). Illuminating DSpace's linked data support. <https://www.slideshare.net/pascalbecker/illuminating-dspaces-linked-data-support>
- Deng (2018). A step forward: Adding linked data vocabularies to digital repositories. <https://stars.library.ucf.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1652&context=ucfscholar>
- Digital Commons. <https://www.bepress.com/products/digital-commons/>
- DSpace: Linked (open) data. <https://wiki.duraspace.org/display/DSDOC6x/Linked+%28Open%29+Data>
- FAST: Faceted Application of Subject Terminology. <http://id.worldcat.org/fast>
- FAST linked data API. <https://www.oclc.org/developer/develop/web-services/fast-api/linked-data.en.html>
- Free Your Metadata. Linked data. <http://freeyourmetadata.org/>
- International Standard Name Identifier (ISNI). <http://www.isni.org/>
- Islandora CLAW. <https://islandora.ca/CLAW>
- Lampron et. al. (2016). Challenges of mapping digital collections metadata to schema.org: Working with CONTENTdm. <https://experts.illinois.edu/en/publications/challenges-of-mapping-digital-collections-metadata-to-schemaorg-w>
- LC Linked Data Service: Authorities and vocabularies. <https://id.loc.gov/>
- Motley Collection of Theatre and Costume Design (New)—Hamlet--Caesar. <http://imagesearch-test1.library.illinois.edu/cdm/ref/collection/motley-new/id/599>
- OCLC linked data. <https://www.oclc.org/developer/develop/linked-data.en.html>
- Open Researcher and Contributor ID (ORCID). <https://orcid.org/>

Resources

- OpenRefine. <http://openrefine.org/>
- OpenRefine. Documentation for users. <https://github.com/OpenRefine/OpenRefine/wiki/Documentation-For-Users>
- OpenRefine Recipes. <https://github.com/OpenRefine/OpenRefine/wiki/Recipes>
- OpenRefine. Reconcilable data sources. <https://github.com/OpenRefine/OpenRefine/wiki/Reconcilable-Data-Sources>
- OpenRefine. Reconciliation. <https://github.com/OpenRefine/OpenRefine/wiki/Reconciliation>
- Orbis Cascade Alliance. OpenRefine for metadata cleanup. <https://www.orbiscascade.org/openrefine-for-metadata-cleanup/>
- Orbis Cascade Alliance. OpenRefine for metadata enrichment. <https://www.orbiscascade.org/using-openrefine-for-metadata-enrichment/>
- Oregon Digital. <https://oregondigital.org/catalog/>
- Ozmeka. <https://github.com/ozmeka/ozmeka>
- Reconcile-csv: <http://okfnlabs.org/reconcile-csv/>
Reconcile-csv in GitHub: <https://github.com/okfn/reconcile-csv>
- Tay, Aaron. OpenRefine, & reconciliation services - learning the ropes. <http://musingsaboutlibrarianship.blogspot.com/2017/03/openrefine-reconciliation-services.html>
- The Linked Open Data Cloud. <https://lod-cloud.net/>
- Transforming library metadata into linked library data: Introduction and review of linked data for the library community, 2003–2011. <http://www.ala.org/alcts/resources/org/cat/research/linked-data>
- Virtual International Authority File (VIAF). <https://viaf.org/>
- Wikidata. <https://www.wikidata.org>
- Wikidata Query Service. <https://query.wikidata.org/>
- Williamson, E. P. Fetching and parsing data from the web with OpenRefine. <https://programminghistorian.org/lessons/fetch-and-parse-data-with-openrefine>
- Worldcat Identities. www.worldcat.org/identities



Acknowledgement

Information Technology & Digital Initiatives
University of Central Florida Libraries



Thank you!

Contact

Sai Deng

Metadata Librarian & Associate Librarian

University of Central Florida Libraries

sai.deng@ucf.edu