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RKBExplorer: Repositories, Linked Data and Research Support

At
Eprints User Group, Open Repositories 2009

Hugh Glaser, Ian Millard & Les Carr

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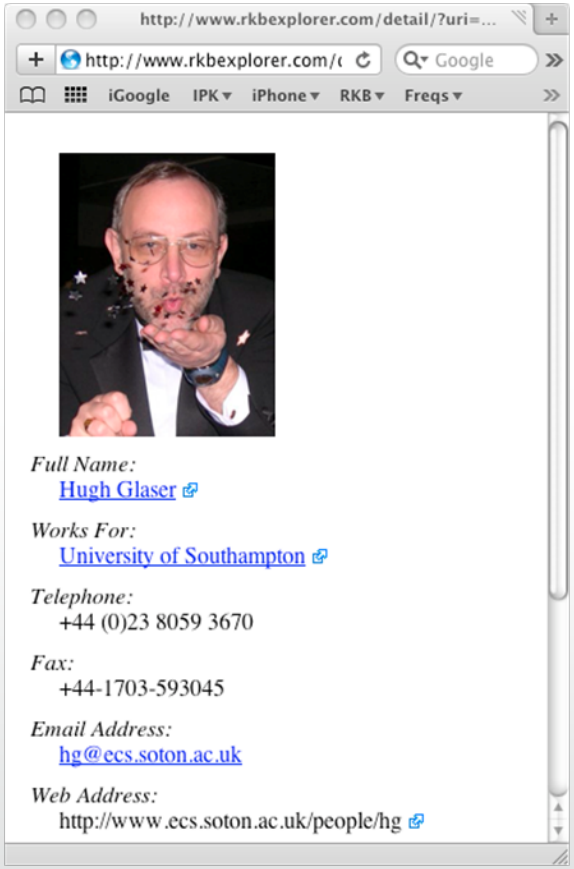
This is me



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Background

- Rich resource of Repositories
- Other rich resources (NSF, CORDIS, ResearchIndex, Wikipedia)
- Where is the added value?

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Linked Data

- Designed for just this
- “the Semantic Web done right, and the Web done right”
  - Tim Berners-Lee
- An Infrastructure for Naming things and Linking things
- OR can/should join

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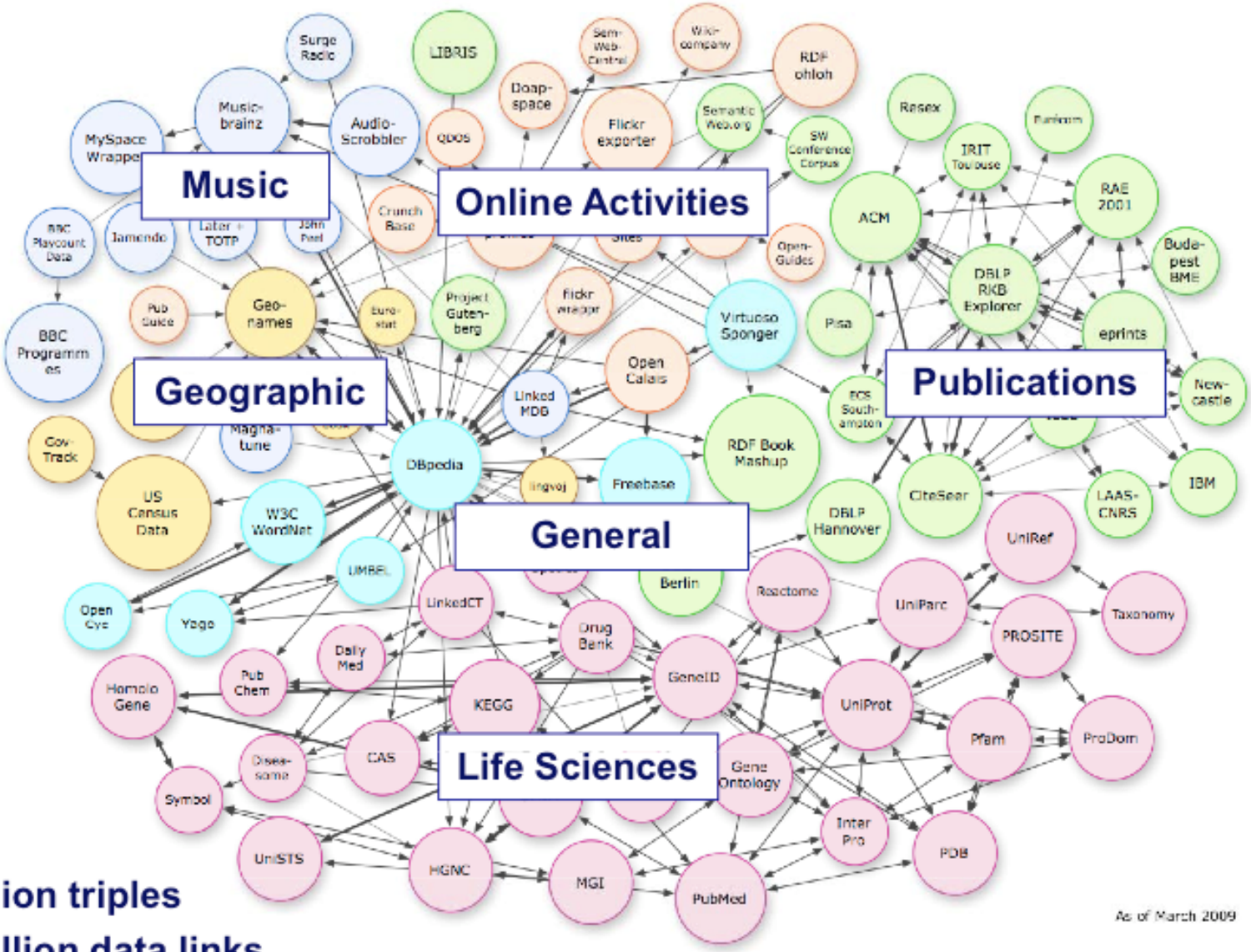
RKB and RKBExplorer

- RKB (ReSIST Knowledge Base) and RKBExplorer
- Knowledge-enabled infrastructure for cooperation in research into resilient systems
- Came out of CS AKTiveSpace
  - (Semantic Web Challenge winner 2003)
- Reasonably mature system and ongoing development

LOD Datasets on the Web: March 2009



4.5 billion triples

180 million data links

Harvest some ePrints repositories

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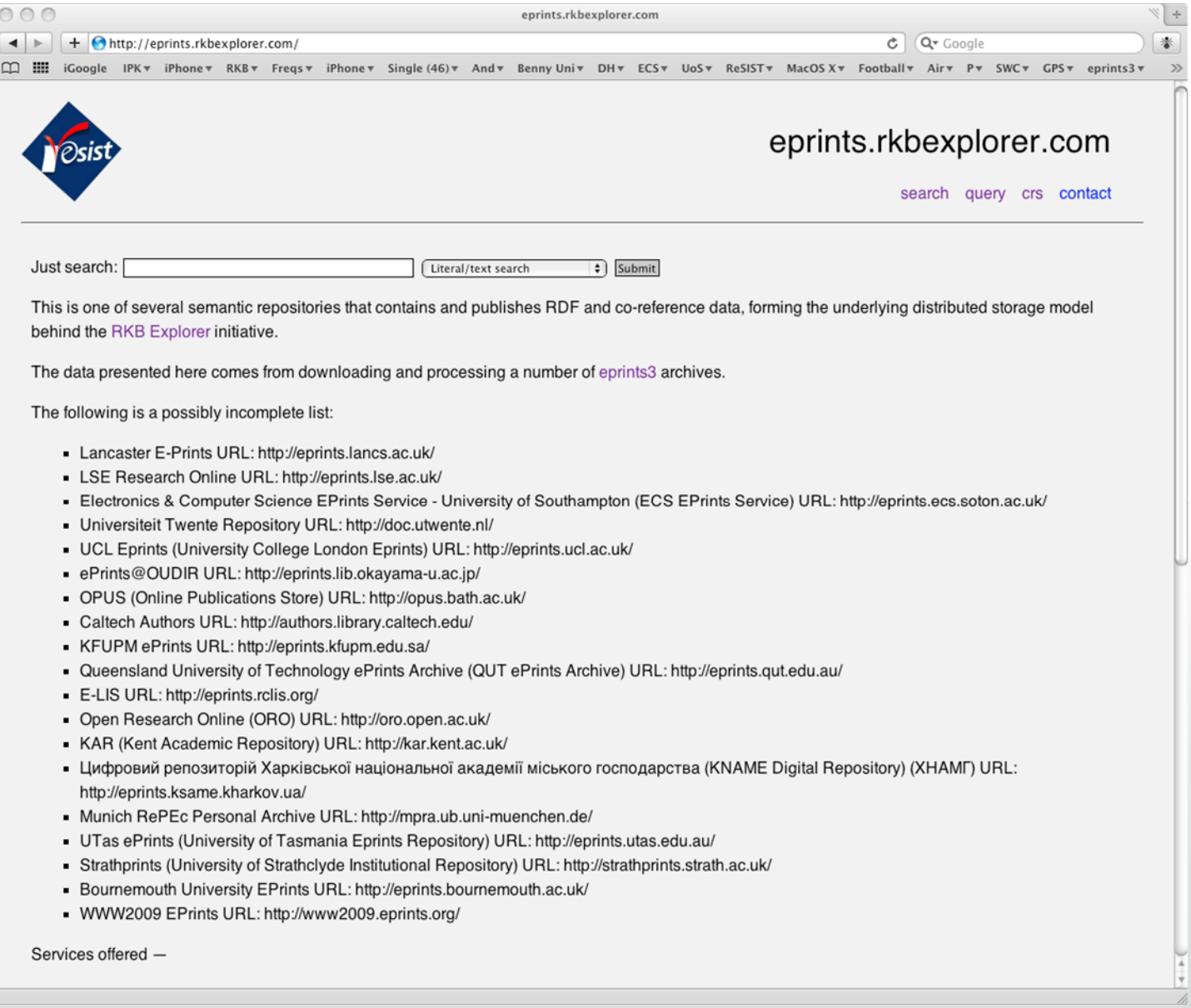

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One of Many KBs, including other ePrints

acm.rkbexplorer.com	italy.rkbexplorer.com
budapest.rkbexplorer.com	kaunas.rkbexplorer.com
citeseer.rkbexplorer.com	**kisti.rkbexplorer.com**
cordis.rkbexplorer.com	laas.rkbexplorer.com
courseware.rkbexplorer.com	lisbon.rkbexplorer.com
darmstadt.rkbexplorer.com	newcastle.rkbexplorer.com
dblp.rkbexplorer.com	**nsf.rkbexplorer.com**
dbpedia.org	pisa.rkbexplorer.com
deepblue.rkbexplorer.com	rae2001.rkbexplorer.com
deploy.rkbexplorer.com	**resex.rkbexplorer.com**
epsrc.rkbexplorer.com	roma.rkbexplorer.com
eurecom.rkbexplorer.com	southampton.rkbexplorer.com
ft.rkbexplorer.com	ulm.rkbexplorer.com
ibm.rkbexplorer.com	unlocode.rkbexplorer.com
ieee.rkbexplorer.com	wiki.rkbexplorer.com
irit.rkbexplorer.com	xxx.yyy.zzz

Range from a few 100 to more than 10,000,000 “facts”

Now Look at an Author

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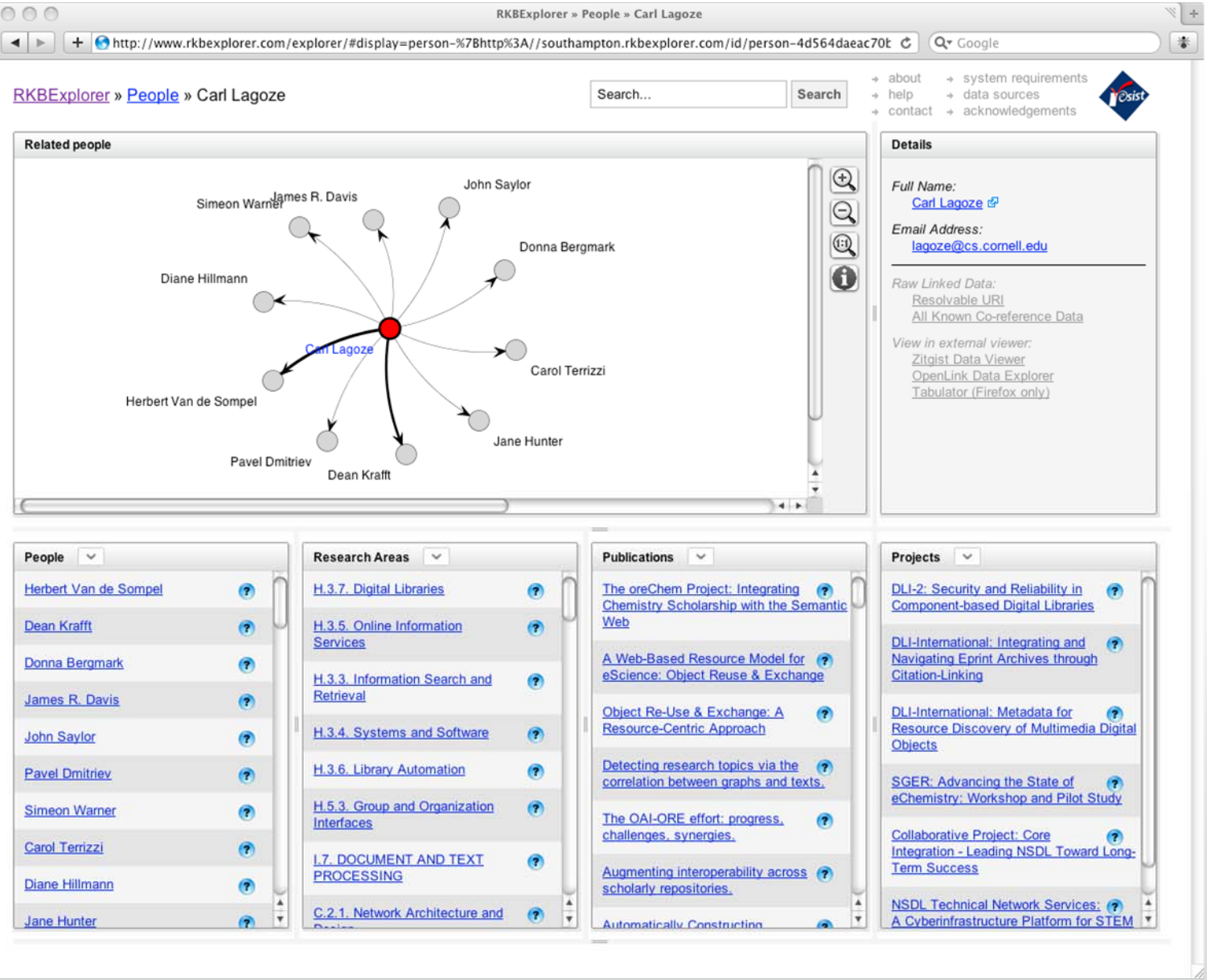

Or a Paper

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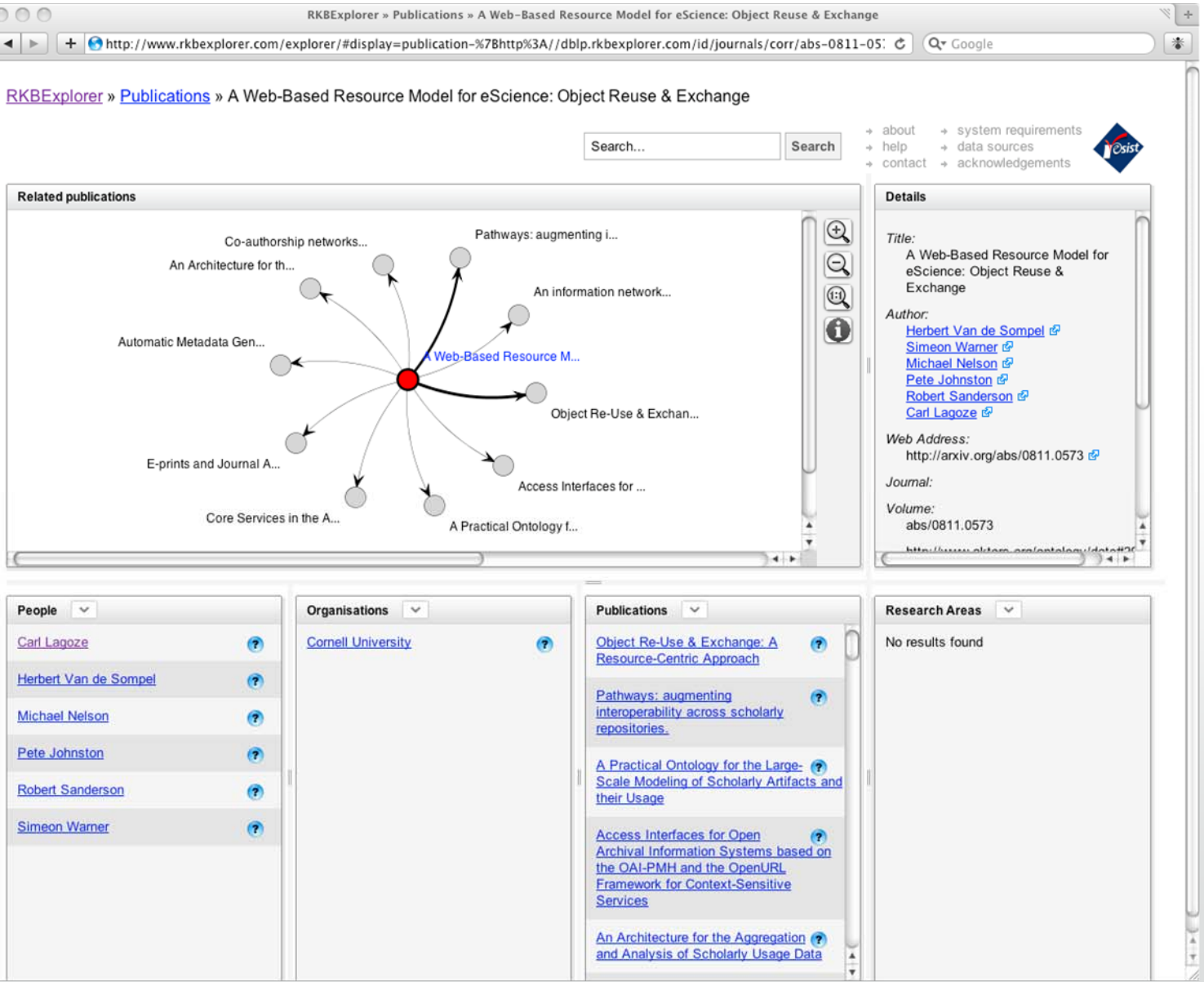

Or a Couple of People

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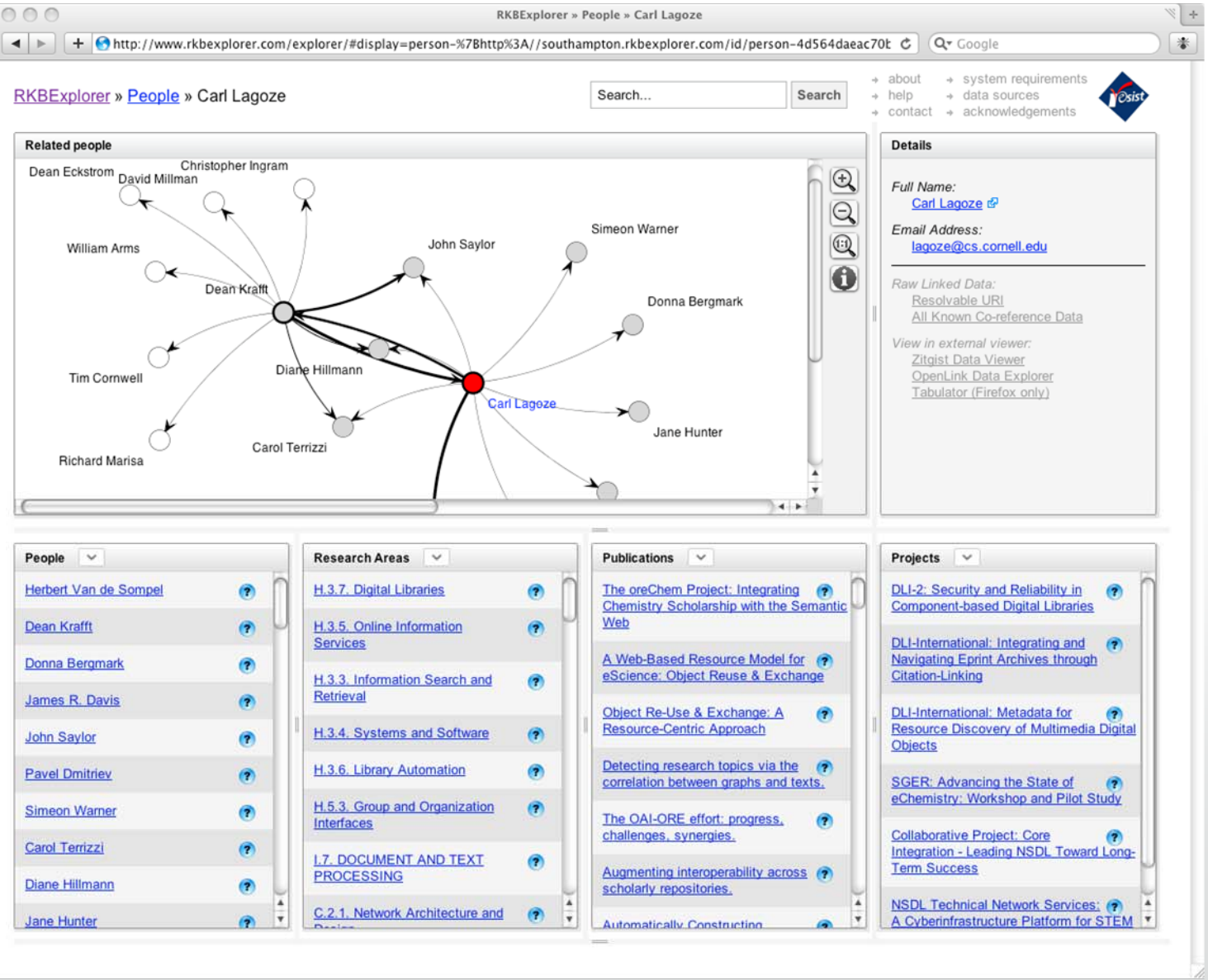

And how they are linked

And Why they are Linked?

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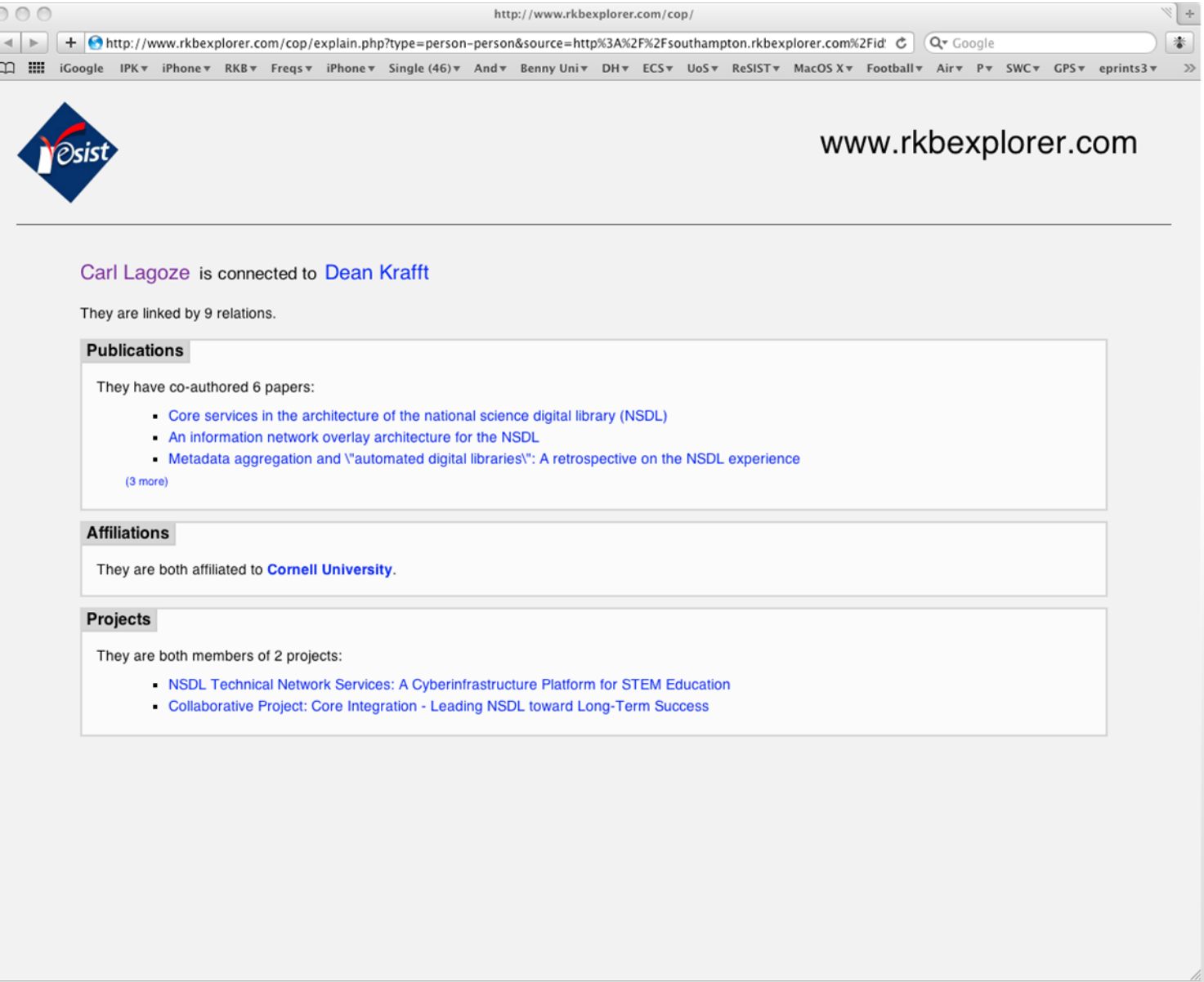

Who is Carl Lagoze?

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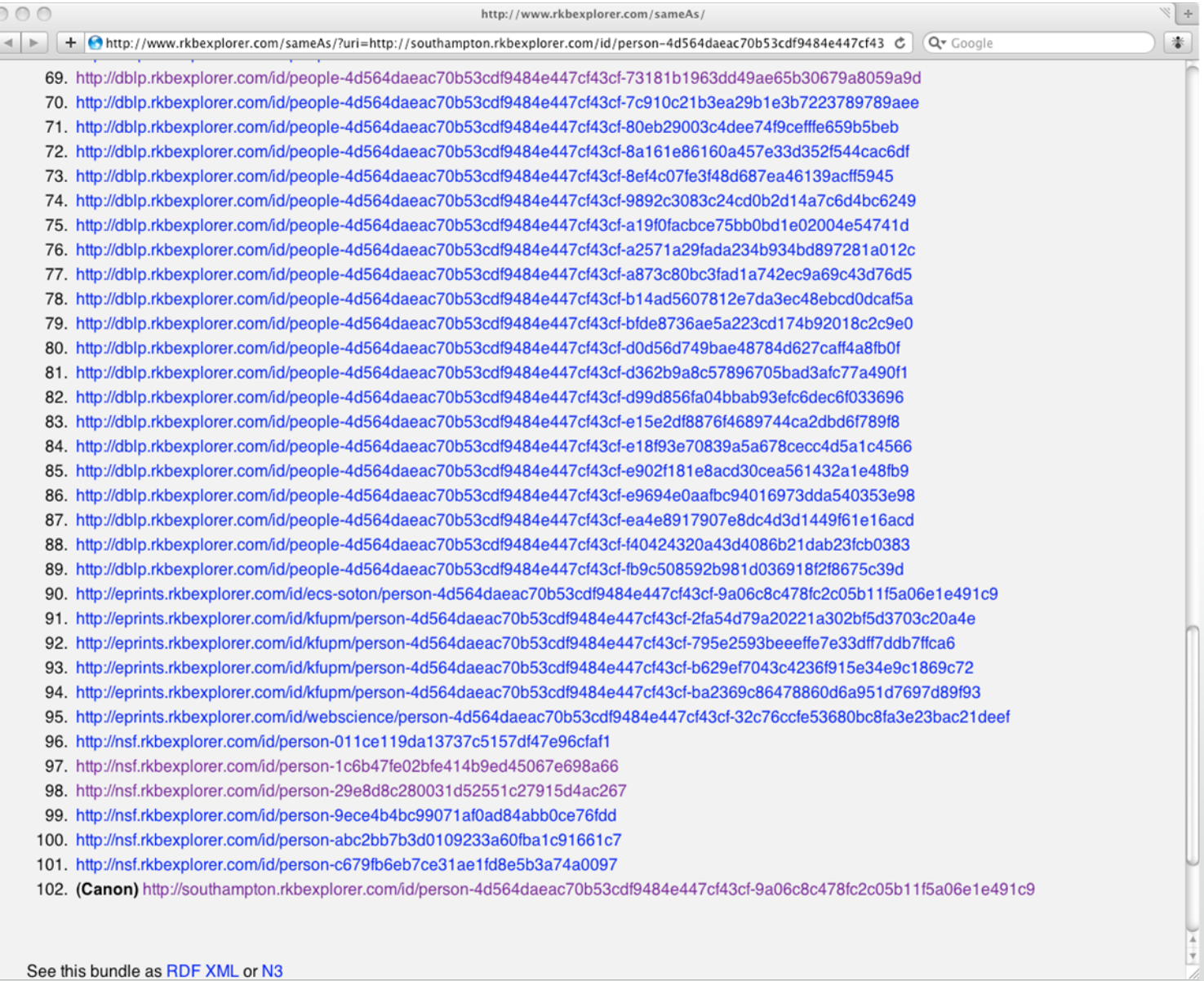

Co-Reference

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- Repositories have people, publications, etc. from other institutions who also have records there and elsewhere
- And vice versa
- Co-Reference is a Big Problem
  - Everything is a URI (not title, name, number…)
  - Identifying multiple URIs for one resource
  - Rejecting incorrectly conflated resources
  - Publishing
  - Using
- Coldstart
  - A serious problem
  - Nothing is linked to anything
  - Not even (reliably) within most repositories

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Co-Reference Service (CRS)

- CRS Subsystem
  - Find co-references
  - Store them
  - Publish them
    - Essentially:
    - URI_i -> { URI_1, ..., URI_i, ..., URI_n }
  - Recommend a “Canon”
- Published by the Data Publisher
  - And possibly others
- Middleware aggregates co-references from recognised CRSes

Co-Reference Closure

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Complete Co-Reference Information

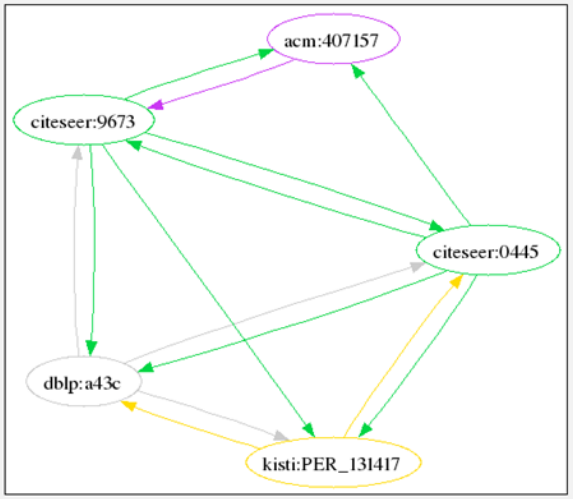
This service computes the equivalence class within the known URIs for a specified URI, by consulting all relevent CRS knowledge bases.

<http://kisti.rkbexplorer.com/id/PER_0000000000000131417> Go

Equivalent URIs...

1. **(Canon)** http://acm.rkbexplorer.com/id/person-407157
2. http://citeseer.rkbexplorer.com/id/resource-CSP179673
3. http://citeseer.rkbexplorer.com/id/resource-CSP180445
4. http://dblp.rkbexplorer.com/id/people-1ec5a600299222dd6374695ef5214f05-90d423eb148125a6e5c573dc5a15a43c
5. http://kisti.rkbexplorer.com/id/PER_0000000000000131417

The following diagram shows the interconnectivity between the CRS knowledge bases which maintain the context-dependent representation of coreference for each of the RKBExplorer domains.



Seungwoo Lee

Showing information queried from all repositories ...

Showing information queried from all repositories ...

Subject	Property	Object/Value	Source
Seungwoo Lee	akt:full-name	Seungwoo Lee [Explore]	acm-periodicals.rdf >>
Seungwoo Lee	akt:full-name	Seungwoo Lee [Explore]	acm-proceedings.rdf >>
Seungwoo Lee	akt:full-name	Seungwoo Lee [Explore]	dblp-publications-2001.rdf >>
Seungwoo Lee	akt:has-affiliation	Electrical and Computer Engineering Division, Pohang University of Science & Technology (POSTECH), Pohang, South Korea.gblee@postech.ac.kr	acm-periodicals.rdf >>
Seungwoo Lee	akt:has-affiliation	POSTECH, Pohang, Korea	acm-proceedings.rdf >>
Seungwoo Lee	kisti:engNameOfPerson	Seungwoo Lee [Explore]	datatypeproperties.ttl >>
Seungwoo Lee	rdf:type	akt:Affiliated-Person	acm-periodicals.rdf >>
Seungwoo Lee	rdf:type	akt:Affiliated-Person	acm-proceedings.rdf >>
Seungwoo Lee	rdf:type	Generic Agent	acm-periodicals.rdf >>
Seungwoo Lee	rdf:type	Generic Agent	acm-proceedings.rdf >>
Seungwoo Lee	rdf:type	Generic Agent	dblp-publications-2001.rdf >>
Seungwoo Lee	rdf:type	akt:Person	acm-periodicals.rdf >>
Seungwoo Lee	rdf:type	akt:Person	acm-proceedings.rdf >>
Seungwoo Lee	rdf:type	akt:Person	dblp-publications-2001.rdf >>
Seungwoo Lee	rdf:type	PER_char(20)"^^	datatypeproperties.ttl >>
Seungwoo Lee	rdf:type	PER_char(20)"^^	objectproperties.ttl >>
Seungwoo Lee	rdf:type	PER_char(20)"^^	resources.ttl >>

Subject	Property	Object	Source
Automatic acquisition of named entity tagged corpus from world wide web	akt:has-author	Seungwoo Lee	acm-proceedings.rdf >>
A Corpus-Based Learning Method of Compound Noun Indexing Rules for Korean	akt:has-author	Seungwoo Lee	acm-periodicals.rdf >>
SiteQ: Engineering High Performance QA System Using Lexico-Semantic Pattern Matching and Shallow NLP.	akt:has-author	Seungwoo Lee	dblp-publications-2001.rdf >>
A Corpus-Based Learning Method of Compound Noun			dblp-publications-

Open System

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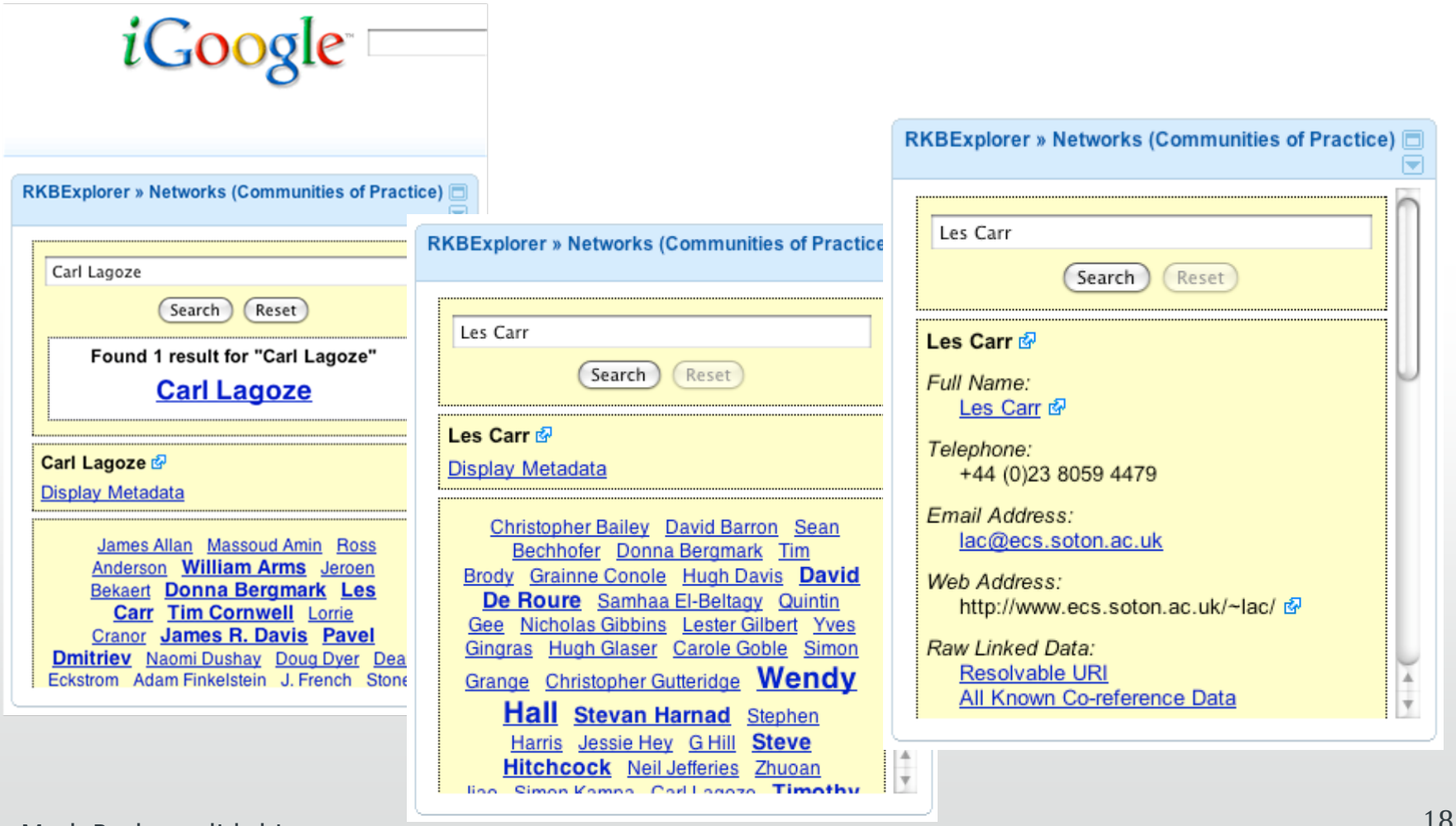
- RKBExplorer is only one interface
  - And not a required part
- Services:
  - Details for a paper (the right hand pane in RKBExplorer):
    - http://www.rkbexplorer.com/detail/?uri=http://southampton.rkbexplorer.com/id/eprints-12614
  - Network of people for a publication (lower pane):
    - http://www.rkbexplorer.com/network/?uri=http://southampton.rkbexplorer.com/id/eprints-12614&type=publication-person
  - …
- Other Interfaces (using the services)
  - Personal Web pages
  - iPhone
  - iGoogle Gadget

Gadget – find out about people



Mark Borkum did this

Update in Action

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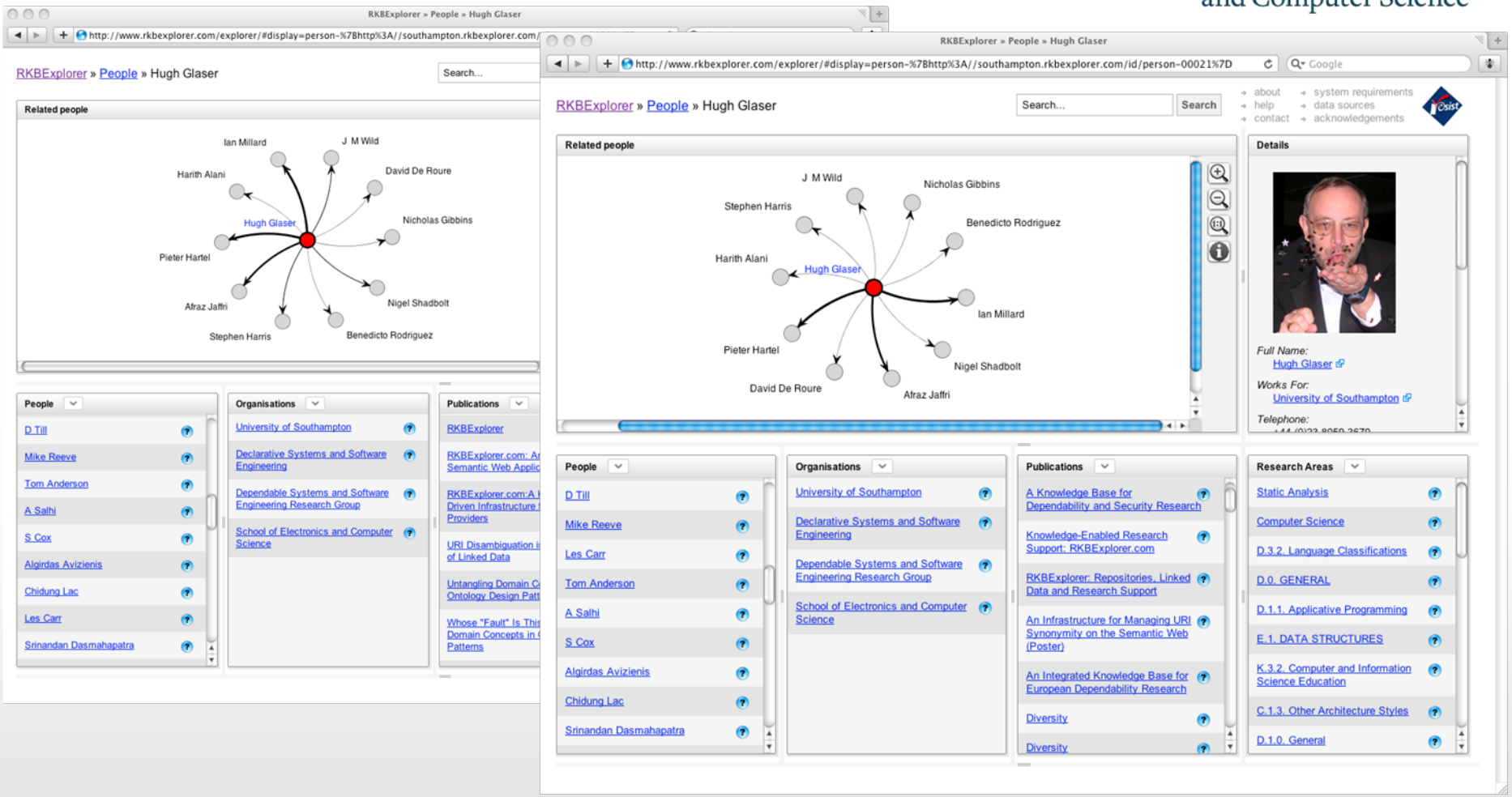

Before and after inserting this paper in the Southampton ePrints repository and RKB has noticed
Note the position of Les Carr in Hugh's related People

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Concluding Remarks

- ePrints today, other systems tomorrow
  - Other related technologies (such as OAI-ORE)
  - Are they right for this?
- Please don't stop at the repository
- Go on and get the added value of Linked Data
- ePrints has plans to publish RDF
  - Will the schema (ontology) by expressive enough
- Worry about your co-reference
  - Do you have IDs in your respository?
  - Can you reliably identify all the papers of a single person?

http://eprints.ecs.soton.ac.uk/17373/

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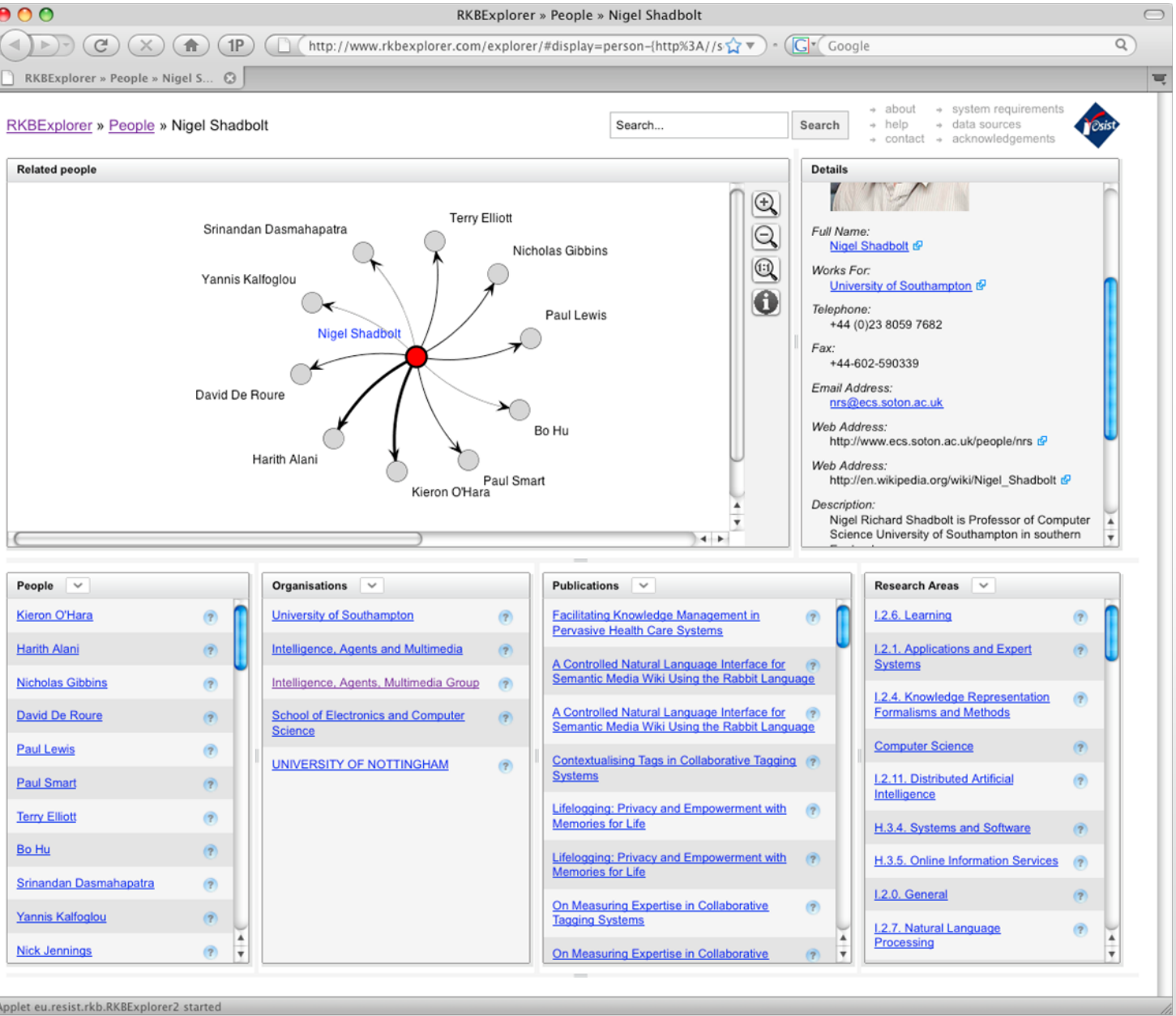

RKBExplorer.com

Try it!