Fresnel: A Browser-Independent Presentation Vocabulary for RDF

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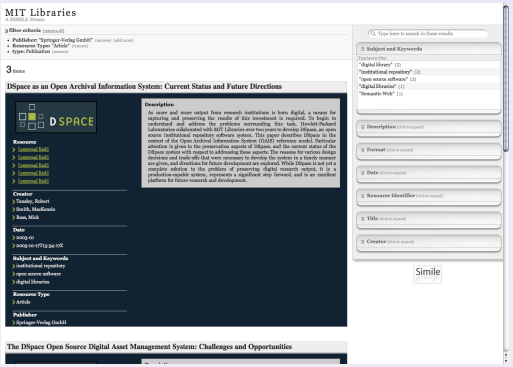
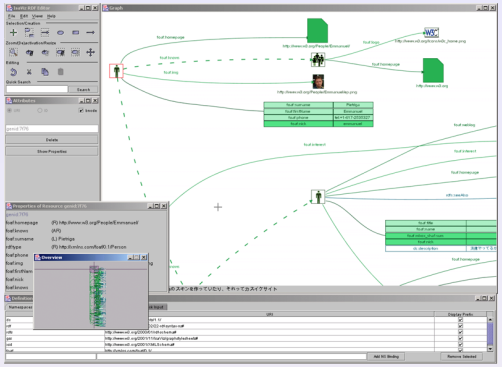
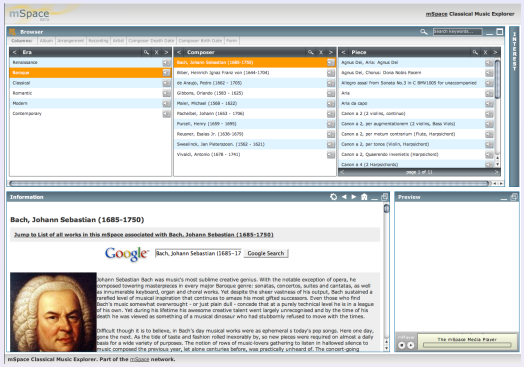
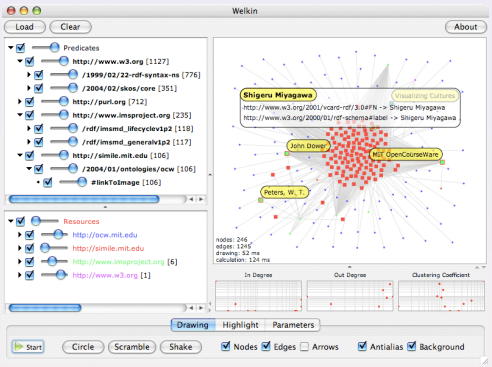
November 7th, 2006

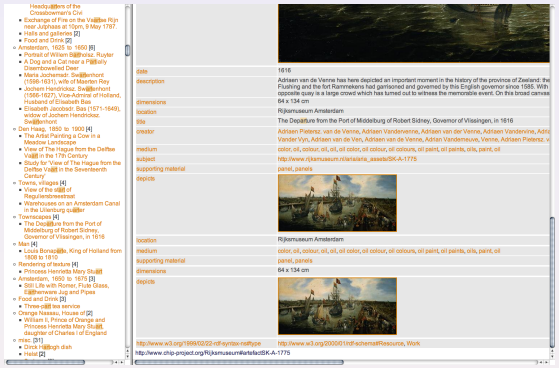
Semantic Web Browsers and other RDF Visualization Tools

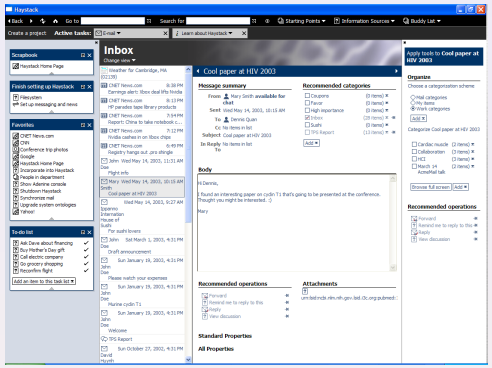






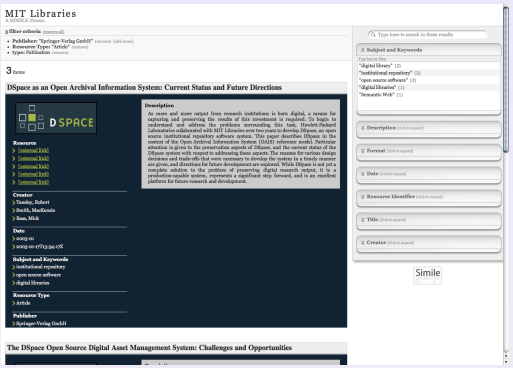


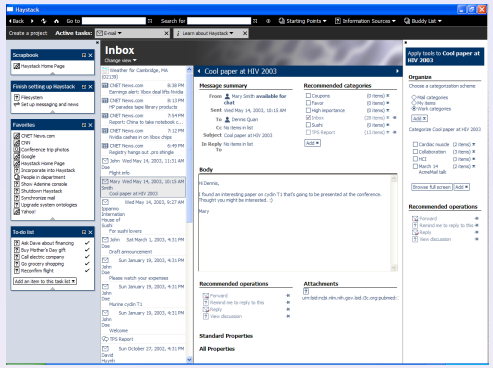


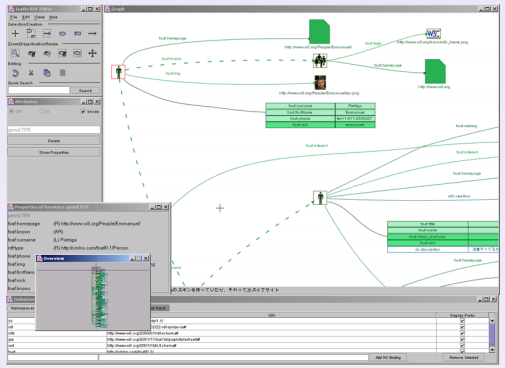


- Longwell, Noadster, mSpace, Brownsauce, Haystack, Piggy Bank, IsaViz/GSS, Welkin, RDFAuthor, Tabulator, SWOOP, Protégé-OWL, /facet, . . .

Applications with different goals and approaches . . .







- Audience :
  - Mainly for end users :
    - General-purpose Semantic Web browsers
    - Domain-specific Semantic Web-based applications
  - Mainly for developers :
    - Graphical RDF visualization tools
    - Ontology editors
- Representation paradigms and customization capabilities :
  - Web-based interfaces, rich WIMP clients, node-link diagrams
  - Style sheets, procedural transformations, templates

. . . but faced with the same core issues

- Presentation process :
  - Select *what* information items to show
  - Specify *how* to organize and display these information items
- Specification of presentations $\equiv$ **Presentation knowledge**

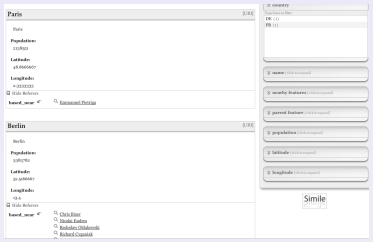
"The Semantic Web provides a common framework that allows data to be shared and reused across application, enterprise, and community boundaries. [...]" `[http://www.w3.org/2001/sw/]`

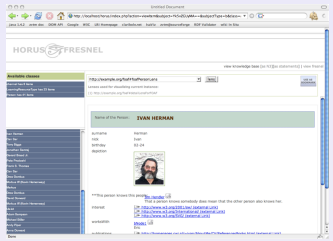
- Promote the exchange and reuse of presentation knowledge between Semantic Web UI applications

Fresnel : a presentation vocabulary for RDF

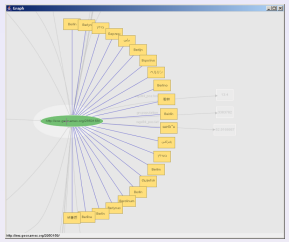
- Design vocabularies to capture information about how to present Semantic Web content to users
- A set of core vocabularies :
  - browser/application independent
  - representation paradigm independent
  - kept as simple as possible
  - easy to learn and use
  - easy to implement
- Extension vocabularies (paradigm-specific, or addressing specific issues)

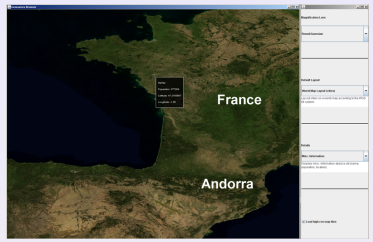
Outline


Longwell


Horus

Cardovan

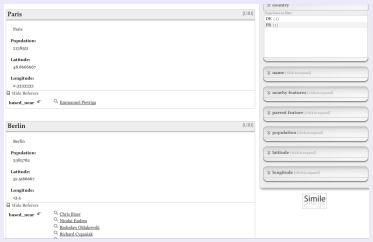

IsaViz



Geonames Browser

- Fresnel : foundational concepts and overview
- Reusability in diverse applications
- Extensiblity (Fresnel2D)

Outline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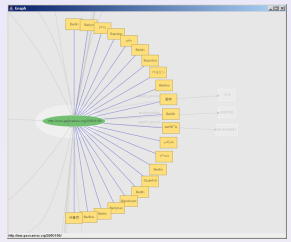
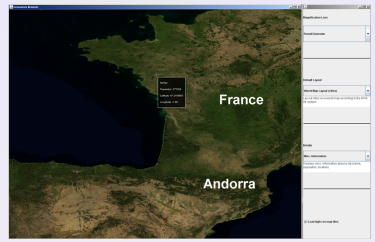

IsaViz

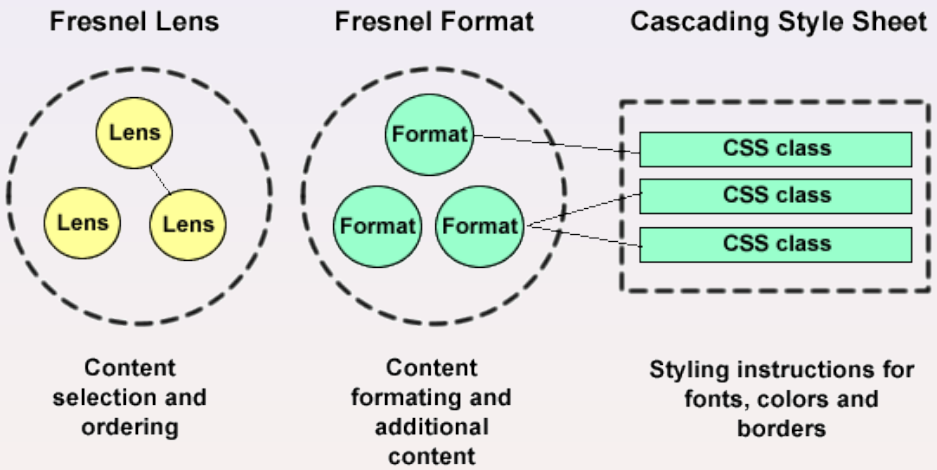


Geonames Browser

- Fresnel : foundational concepts and overview
- Reusability in diverse applications
- Extensiblity (Fresnel2D)

Fresnel's Foundational Concepts

- Lenses : content selection and ordering
- Formats : content formating
- Groups associate lenses and formats that are designed to work together
- External style sheets : use of CSS class hooks for styling (font, color, etc.)



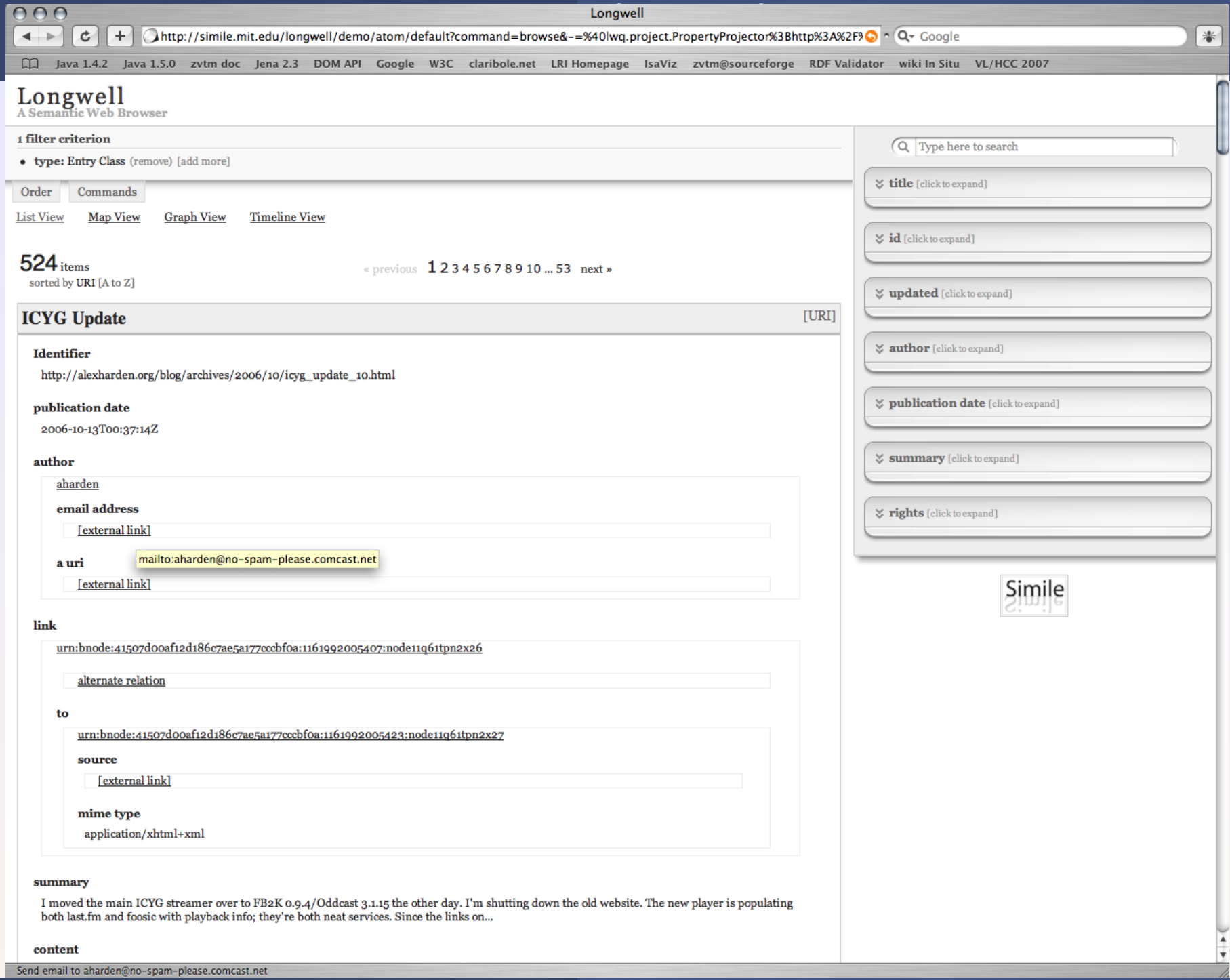
- Repositories of presentation knowledge (lenses, formats, . . .)

Core Lens Vocabulary - Content Selection and Ordering

- `classLensDomain` and `instanceLensDomain` define the set of resources to which a lens applies
- `showProperties` and `hideProperties` control what properties of the selected resource are displayed, in what order
- `mergeProperties` and `alternateProperties` handle cases of properties that should be displayed together or used as fallbacks (irregularity of data)
- Lenses used as sublenses : specify what lens to use to show the value of a given property (possible recursion)

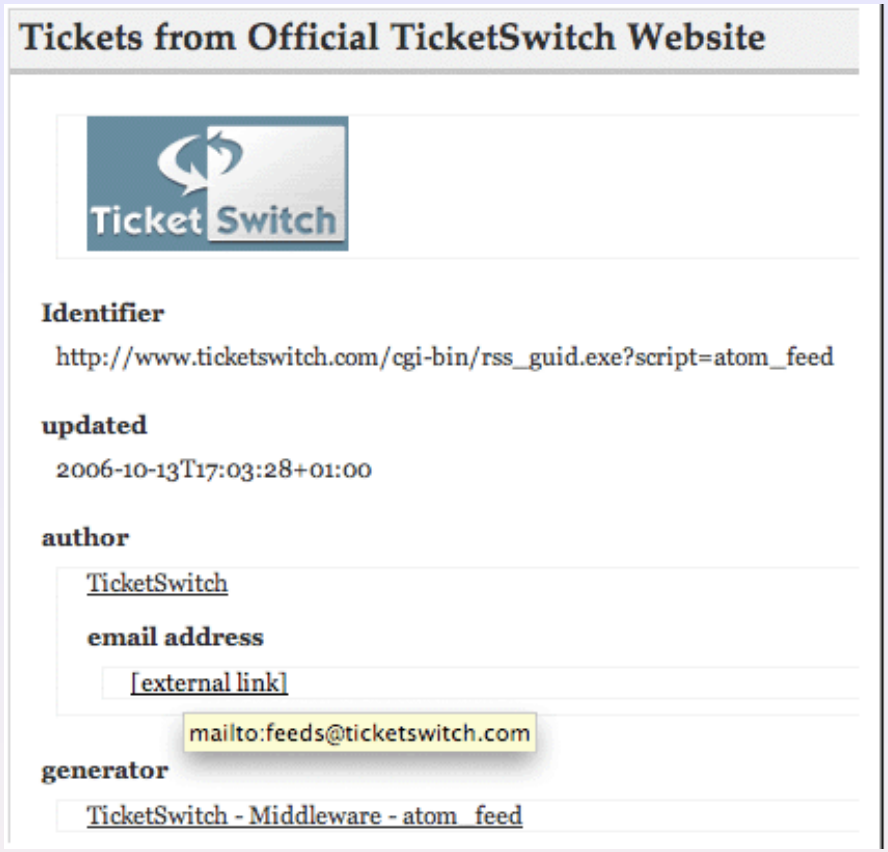
```
:entryLens rdf:type fresnel:Lens ;
    fresnel:purpose fresnel:defaultLens ;
    fresnel:classLensDomain atom:Entry ;
    fresnel:showProperties (
        atom:id
        atom:published
        [ fresnel:property atom:author ; fresnel:sublens :personLens ]
        [ fresnel:property atom:link ; fresnel:sublens :linkLens ]
        atom:source
        fresnel:property atom:summary
        [ fresnel:property atom:content ; fresnel:sublens :contentLens ]
    ) ;
    fresnel:group :atomgr .

:personLens rdf:type fresnel:Lens ;
    fresnel:purpose fresnel:defaultLens ;
    fresnel:classLensDomain atom:Person ;
    fresnel:showProperties (
        atom:email
        atom:uri
    ) ;
    fresnel:group :atomgr .
```


Longwell
http://simile.mit.edu/longwell/demo/atom/default?command=browse&--%40lwq.project.PropertyProjector%3Bhttp%3A%2F9
Google
Java 1.4.2 Java 1.5.0 zvtm doc Jena 2.3 DOM API Google W3C claribole.net LRI Homepage IsaViz zvtm@sourceforge RDF Validator wiki In Situ VL/HCC 2007
Longwell
A Semantic Web Browser
1 filter criterion
type: Entry Class (remove) [add more]
Order
Commands
List View
Map View
Graph View
Timeline View
524 items
sorted by URI [A to Z]
« previous 1 2 3 4 5 6 7 8 9 10 ... 53 next »
ICYG Update
[URI]
Identifier
http://alexharden.org/blog/archives/2006/10/icyg_update_10.html
publication date
2006-10-13T00:37:14Z
author
aharden
email address
[external link]
a uri
mailto:aharden@no-spam-please.comcast.net
[external link]
link
urn:bnode:41507d00af12d186c7ae5a177cccbf0a:1161992005407:node11q61tpn2x26
alternate relation
to
urn:bnode:41507d00af12d186c7ae5a177cccbf0a:1161992005423:node11q61tpn2x27
source
[external link]
mime type
application/xhtml+xml
summary
I moved the main ICYG streamer over to FB2K 0.9.4/Oddcast 3.1.15 the other day. I'm shutting down the old website. The new player is populating both last.fm and foosic with playback info; they're both neat services. Since the links on...
content
Type here to search
title [click to expand]
id [click to expand]
updated [click to expand]
author [click to expand]
publication date [click to expand]
summary [click to expand]
rights [click to expand]
Simile
Send email to aharden@no-spam-please.comcast.net

Core Formatting Vocabulary

- high-level, representation paradigm independent formatting instructions
- `propertyFormatDomain` defines the set of properties to which a format applies
- `classFormatDomain` and `instanceFormatDomain` defines the set of resources to which a format applies
- `value` controls how a property value is rendered (text, fetched image, link)
- `label` is used to specify a human-friendly label for properties
- `content*` are used to specify additional content to put before, after, or in between property values




```
:logoFormat rdf:type fresnel:Format ;
    fresnel:propertyFormatDomain atom:logo ;
    fresnel:label fresnel:none ;
    fresnel:value fresnel:image ;
    fresnel:group :atomgr .

:emailFormat rdf:type fresnel:Format ;
    fresnel:propertyFormatDomain atom:email ;
    fresnel:value fresnel:externalLink ;
    fresnel:label "email address"@en ;
    fresnel:group :atomgr .
```

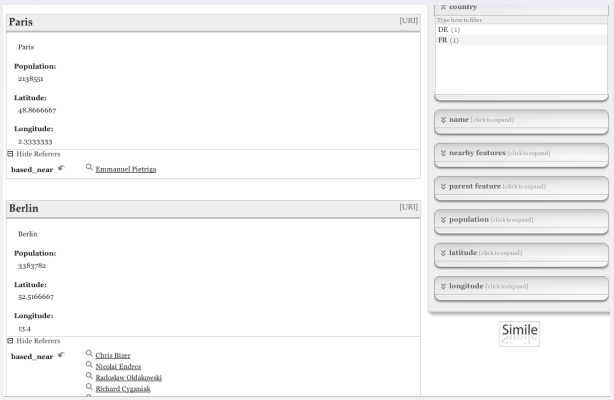
- For a complete description of core vocabularies, see :
  - the paper,
  - and `http://www.w3.org/2005/04/fresnel-info/`

Selector Languages

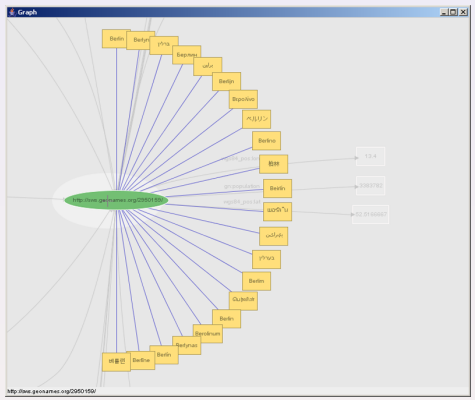
- Used to specify lens and format domains, as well as what properties a lens should display
- Basic selectors take the form of a single URI (type test / URI test)
  - `fresnel:classLensDomain foaf:Person`
- FSL selectors are XPath-like graph traversal expressions :
  - `foaf:Person[count(foaf:knows) > 5 and airport:iataCode/text() = "CDG"]`
- SPARQL selectors are SQL-like queries :
  - `SELECT ?mbox WHERE ( ?x foaf:name "John Doe" ) ( ?x foaf:mbox ?mbox )`

Example : browsing Geonames + FOAF data

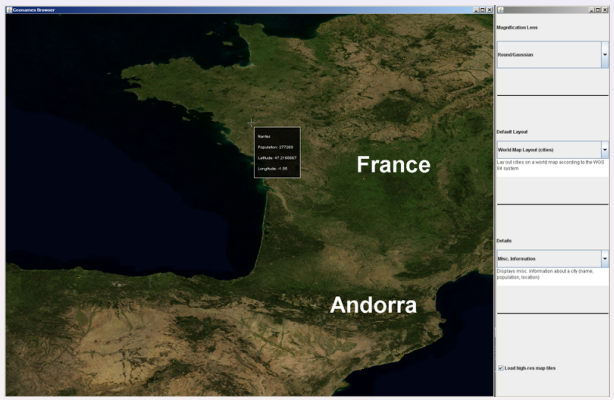
- Using the same lenses and formats in three applications
  - Longwell : Web-based faceted RDF browser ;
  - IsaViz : low-level visual RDF authoring tool ;
  - Geonames Browser : domain-specific application.



Longwell



IsaViz



Geonames Browser

Demo

Extension Vocabularies

- Core vocabularies are designed to be application/paradigm independent
- Express more knowledge $\Longrightarrow$ loss of this property
- Paradigm/Application-specific Vocabularies :
  - all modules are not necessarily aimed at being application/paradigm-independent
  - Fresnel based on RDF, easy to extend
  - Fresnel provides a unified framework for capturing presentation knowledge
- Modules for special needs :
  - describe the purpose of a lens
  - editing displayed data
  - ...

Example of extension vocabulary : Fresnel2D *(work in progress)*

- Extension vocabulary for the 2D layout of RDF data
- Example : layout of Geonames features (populated places) on a world map using WGS84 longitude and latitude properties

```
:cityLens rdf:type fresnel:Lens ;
    rdfs:label "World Map Layout (cities)"@en;
    rdfs:comment "Lay out cities on a world map according to the WGS 84 system"@en;
    fresnel:purpose f2d:layoutLens ;
    fresnel:instanceLensDomain "gn:Feature[gn:featureClass/*[uri(.) = exp('gn:P')]]"^^fresnel:fslSelector ;
    fresnel:showProperties (
        wgs84_pos:long
        wgs84_pos:lat
        gn:name
    ) ;
    fresnel:group :layout .

:cityLayoutFormat rdf:type fresnel:Format ;
    fresnel:instanceFormatDomain "gn:Feature[gn:featureClass/*[uri(.) = exp('gn:P')]]"^^fresnel:fslSelector ;
    f2d:x_pos wgs84_pos:long ;
    f2d:y_pos wgs84_pos:lat ;
    f2d:x_range "<math xmlns='http://www.w3.org/1998/Math/MathML'><interval><cn>-180.0</cn><cn>180.0</cn></interval></math>"
    f2d:y_range "<math xmlns='http://www.w3.org/1998/Math/MathML'><interval><cn>-90.0</cn><cn>90.0</cn></interval></math>"
    fresnel:group :layout .
```

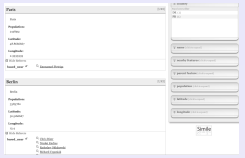
An open, community-based effort

- Implementations :
  - Longwell / Piggy Bank, Horus, IsaViz, Cardovan, Geonames Browser, ...
- Thanks to :
  - Members of the SIMILE and Haystack projects at MIT, especially Stefano Mazzocchi, Stephen Garland, David Huynh, Karun Bakshi
  - Hannes Gassert, Rob Gonzalez, Rouben Meschian, Jacco van Ossenbruggen, Dennis Quan, Lloyd Rutledge
- New contributors are welcome to participate !
- Mailing list and Web site :
  - `fresnel-dev@simile.mit.edu`
  - `http://www.w3.org/2005/04/fresnel-info/`

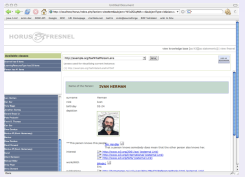
Backup Slides

Fresnel Implementations

Simile Longwell : Web-based faceted Semantic Web browser

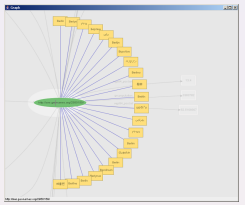


Horus : Another Web-based browser

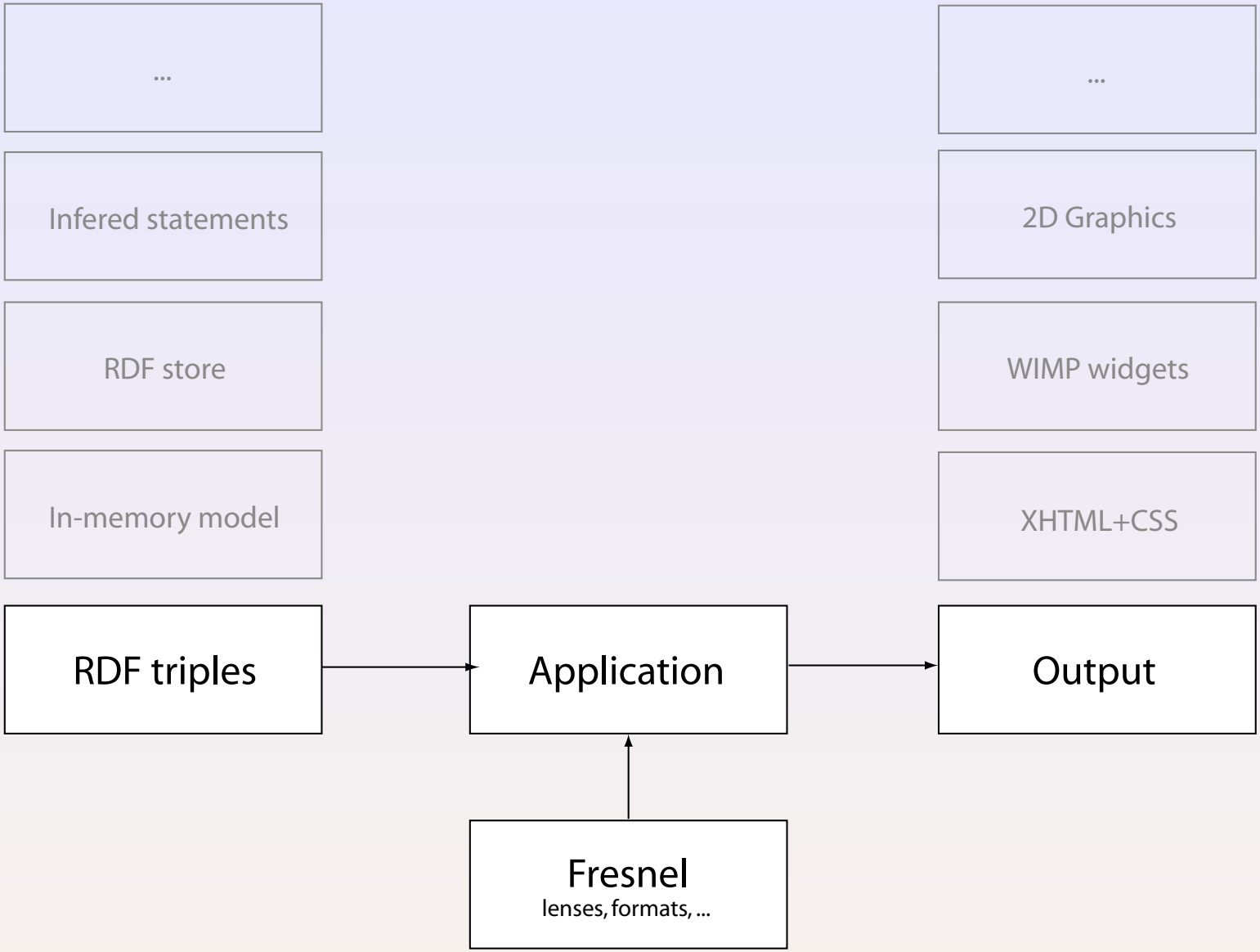


Cardovan : Java/SWT-based browser and editor

IsaViz : Visual authoring tool for RDF models represented as node-link diagrams



GNB : Geonames browser based on NASA's Blue Marble Next Generation high-res world map


...
Infered statements
RDF store
In-memory model
RDF triples
Application
Output
...
2D Graphics
WIMP widgets
XHTML+CSS
Fresnel
lenses, formats, ...