Fresnel: A Browser-Independent Presentation Vocabulary for RDF

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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 ≡ **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

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

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- Reusability in diverse applications
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Longwell  
Horus  
Cardovan  
IsaViz  
Geonames Browser
Fresnel’s Foundational Concepts

- Lenses: content selection and ordering
- Formats: content formatting
- 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, ...)

E. Pietriga, C. Bizer, D. Karger, R. Lee
ISWC 2006
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).
Presenting Semantic Web Data
Fresnel: a Presentation Vocabulary for RDF

E. Pietriga, C. Bizer, D. Karger, R. Lee
ISWC 2006
Presenting Semantic Web Data

Fresnel: a Presentation Vocabulary for RDF Concepts and Core Vocabularies

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ISWC 2006

Longwell
A Semantic Web Browser

524 items
sorted by URI [A to Z]

ICYG Update

Identifier

Publication date
2006-10-13T00:37:14Z

Author
aharden

Email address
mailto:aharden@no-spam-please.comcast.net

About

Summary
I moved the main ICYG streamer over to FB2K 0.9.4/Oddcast 3.1.13 the other day. I'm shutting down the old website. The new player is populating both last.fm and foosey with playback info, they're both neat services. Since the links on...

Content
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
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.
Extension Vocabularies

- Core vocabularies are designed to be application/paradigm independent
- Express more knowledge $\implies$ 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

```turtle
: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:showProperties ( wgs84_pos:long
        wgs84_pos:lat
        gn:name
    ) ;
    fresnel:group :layout .

:cityLayoutFormat rdf:type fresnel:Format ;
    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
Presenting Semantic Web Data
Fresnel: a Presentation Vocabulary for RDF

- Reusability
- Extensibility

RDF triples
- Application
- Output

Fresnel lenses, formats, ...

In-memory model
RDF store
Inferred statements

2D Graphics
WIMP widgets
XHTML+CSS

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