INF3580 – Semantic Technologies – Spring 2011

Lecture 15: RDFa

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Today's Plan

1. Reminder
2. Linking RDF to HTML
3. RDFa
4. Conclusion

Outline

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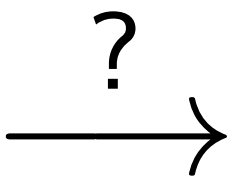
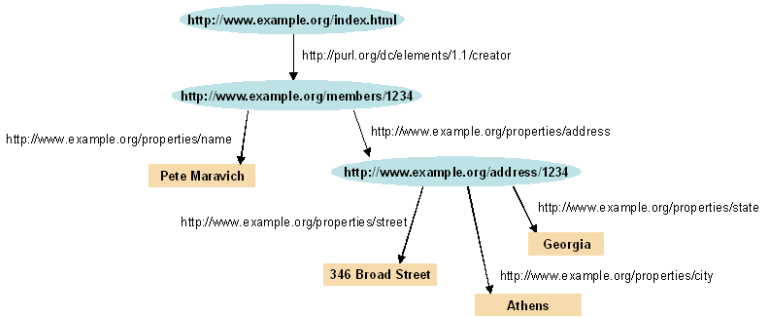
    - for instance dbpedia.org, dblp, and others
  - Published using LOD principles (hash/slash namespaces)
  - Embedded in HTML, as RDFa

Outline

The Problem

- The HTML web contains lots of human-readable information
- How can clients discover the location of corresponding machine-readable information?





Embedding RDF/XML in (X)HTML

- First idea: Embed RDF/XML in HTML or XHTML:

```
<html>
  <head>
    <title>My Homepage</title>
    <rdf:RDF>
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        ...
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- Does not fit HTML or XHTML DTDs
- No satisfactory solution, due to flexible RDF vocabulary
- B.t.w. there *is* a `metadata` element in SVG for this!

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- E.g. a style sheet:

```
<html>
  <head>
    <title>My Homepage</title>
    <link rel="stylesheet" type="text/css" href="style.css">
```

LINKing to RDF

- To link to an RDF representation:

```
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      type="application/rdf+xml"
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  - Note: difference between meta-data and alternative representation
- Various web browser plugins exist to detect these LINKs

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Link:  <foaf.rdf>; rel="meta"; type="application/rdf+xml"
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- Advantage: can be sent also with non-HTML data

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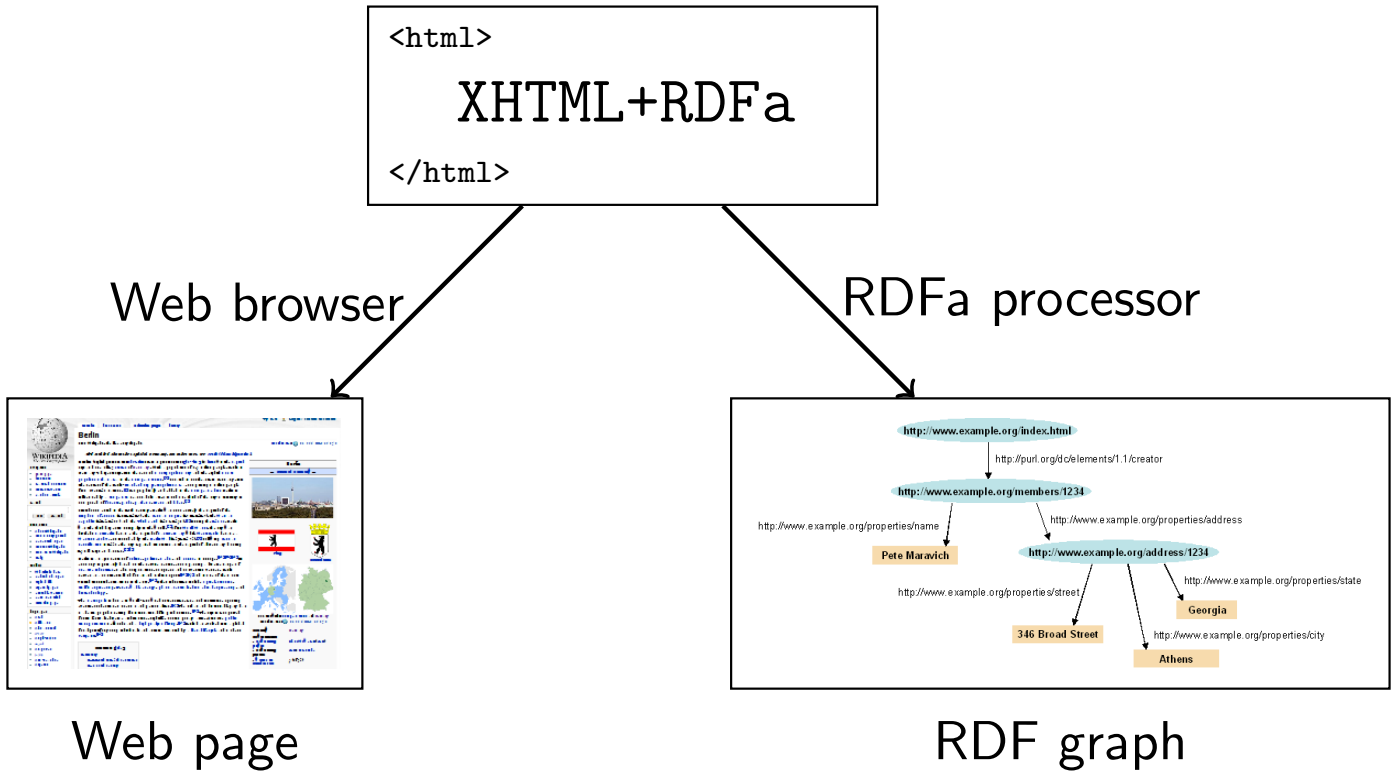
- XHTML in spec., but works with HTML and other XML
- RDFa adds a *fixed* set of attributes to (X)HTML
- Document type:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN"
    "http://www.w3.org/MarkUp/DTD/xhtml-rdfa-1.dtd">
```

RDFa Processing

- Web browsers ignore RDFa attributes
- RDFa processors extract a *single* RDF graph from a document



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  - hyper-links (`href`)
  - textual content
- RDFa attributes can appear in (almost) any element
- As the XHTML is processed, there is always a "current subject" that generated triples refer to
- The current subject starts as the base URI of the document, but can change on the way

Reminder: (X)HTML Meta and Link

- Links and metadata in HTML header:

```
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <title>Page 507</title>
    <meta name="author" content="Sigrid Undset" />
    <link rel="prev" href="page506.html" />
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- Meaning of `name` and `rel` informal
- Only a few values defined by the standard

RDFa property and rel

- "semantic" meta and link in RDFa:

```
<html xmlns="http://www.w3.org/1999/xhtml"
      xmlns:foaf="http://xmlns.com/foaf/0.1/"
      xmlns:dc="http://purl.org/dc/elements/1.1/">
  <head>
    <title>MG's home page</title>
    <meta property="dc:creator" content="Martin Giese" />
    <link rel="foaf:topic" href="foaf.rdf#me" />
  </head>
  <body>...</body>
</html>
```

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  <body>...</body>
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```

- Extracted triples: (<> is base URI!)

```
<> dc:creator "Martin Giese" .
<> foaf:topic <foaf.rdf#me> .
```

Attribute `rel` on `A` elements

- Any hyper-link can be given a "meaning":

```
This document is licensed under a
<a xmlns:cc="http://creativecommons.org/ns#"
   rel="cc:license"
   href="http://creativecommons.org/licenses/by-nc-nd/3.0/">
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- Extracted triple:

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<> cc:license <http://creativecommons.org/.../3.0/> .
```

- Can use `rev` instead of `rel` to swap subject and object

The property attribute

- `rel` is for resource objects, `property` for literal objects:

```
<html xmlns="http://www.w3.org/1999/xhtml"
      xmlns:dc="http://purl.org/dc/elements/1.1/">
  <head>...</head>
  <body>
    <h1 property="dc:title">Kransen</h1>
    Written in <span property="dc:created">1920</span>
  </body>
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- Extracted triples:

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- Extracted triples:

```
<> dc:title "Kransen" ; dc:created "1920" .
```

- Can also use `content` attribute together with `property`:

```
<span property="dc:created" datatype="xsd:dateTime"
      content="2007-09-16T16:00:00-05:00">
  September 16th at 4pm
</span>
```

Changing the Subject

- about changes subject of contained rel and property annotations:

```
<div about="http://.../foaf.rdf#me"
     xmlns:foaf="http://xmlns.com/foaf/0.1/">
  <p property="foaf:name">Martin Giese</p>
  <p> Email:
    <a rel="foaf:mbox" href="mailto:mg@mail.no">
      mg@mail.no</a></p>
  <p> Phone:
    <a rel="foaf:phone" href="tel:+47-31415926">
      31 41 59 26</a></p>
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```
<div typeof="foaf:Person"
     xmlns:foaf="http://xmlns.com/foaf/0.1/">
  <p property="foaf:name">Martin Giese</p>
  <p> Email:
    <a rel="foaf:mbox" href="mailto:mg@mail.no">
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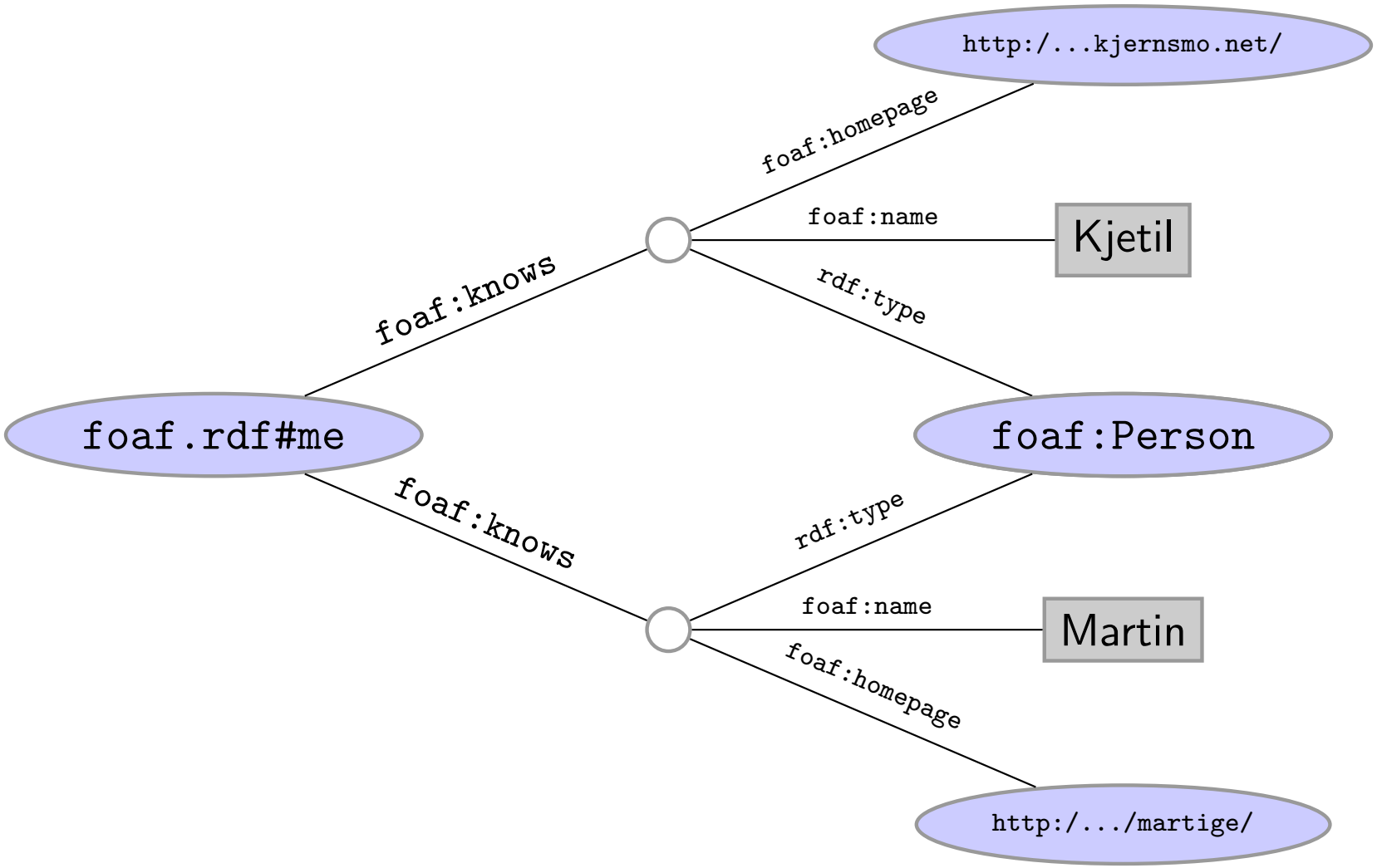
Know Your Friends

- Missing objects collected from contained elements (chaining):

```
<div xmlns:foaf="http://xmlns.com/foaf/0.1/"
     about="foaf.rdf#me" rel="foaf:knows">
  <ul>
    <li typeof="foaf:Person">
      <a property="foaf:name" rel="foaf:homepage"
         href="http://www.kjetil.kjernsmo.net/">Kjetil</a>
    </li>
    <li typeof="foaf:Person">
      <a property="foaf:name" rel="foaf:homepage"
         href="http://heim.ifi.uio.no/martige/">Martin</a>
    </li>
  </ul>
</div>
```

Triples From Chaining Example



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- *Nothing* you couldn't do with a LINK and an RDF file
- Can be convenient to have information in one place

Outline

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That's all Folks!