Introduction to the Unit Programming and Modelling Languages University of Munich

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Projects - Overview

- **Xcerpt:** Declarative, Rule-Based Query Language for the (Semantic) Web (François Bry, Sebastian Schaffert)
- XChange: Declarative Language for Reactivity on the (Semantic) Web (Paula-Lavinia Pătrânjan)
- VOXX: Verbalisation of XML and Xcerpt (Uta Schwertel)
- Rooted Graph Grammars (Sacha Berger)
- CTTN: Computational Treatment of Temporal Notions for the Web (Hans Jürgen Ohlbach)
- CaTTS: Calendar and Time Type System (Stephanie Spranger)
- MPLL: Multi-Paradigm Location Language (Hans Jürgen Ohlbach, Bernhard Lorenz)

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Xcerpt - A Rule-Based Query Language for the Web

- pattern-based instead of path-based selection of data items
- patterns as "examples" of the data
- incompleteness in depth and breadth to accomodate the flexibility of data on the Web
- augmented by (zero or more) variables to retrieve data items
- rule-based querying
- a rule defines a "view" on the data
- rules may be changed to form complex query programs
- rules may be recursive

See: www.xcerpt.org

XChange - Reactivity on the Web

- declarative language for updating data on the (Semantic) Web
- reactivity as communication paradigm on the Web
- rule-based language (event-condition-action rules)
- patterns for update and event specifications
- complex updates as transaction
- processing of composite events
- reactive language embedding a query language
- builds upon the (Semantic) Web query language Xcerpt

See: www.xcerpt.org, www.pms.ifi.lmu.de/mitarbeiter/patranja

VOXX - Verbalisation of XML and Xcerpt

- Vision: User-friendly access to Web data with mobile devices
- Ideal: Spoken natural language
- Problem: Full natural language ambiguous and imprecise
- Automatic processing not (yet) realistic
- Solution: Controlled natural language
  - Use Attempto Controlled English (ACE) (Univ. Zurich)
  - Automatically translatable into first-order logic
  - Combines advantages of natural and formal languages
  - Human and machine understandable
  - More information at
- Task: Bridge formal gap between ACE vs. XML and Xcerpt
- Intermediate representation based on logical relations

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Rooted Graph Grammars

- Schema languages for XML are often based on regular Tree Grammars
- By now, no XML schema language can type/validate references (eg. ID/IDREF, XLink)
- Rooted Graph Grammars extend regular tree grammars to represent typed references and referable objects in XML
- A type system for Xcerpt and XChange is conceived based on Rooted Graph Grammars

CTTN - Computational Treatment of Temporal Notions

The CTTN server with components:

- FuTIRe, a library for fuzzy temporal intervals and relations
- PartLib, a library for periodical temporal notions
- multiple calendar systems
- GeTS, a specification language for temporal notions
- type systems for temporal data in XML documents
- ontologies of temporal notions

www.pms.ifi.lmu.de/mitarbeiter/ohlbach/homepage/projects.shtml

CaTTS - Calendar and Time Type System

CaTTS consists of:

- CaTTS-DL: definition language, itself consisting of
  - CaTTS-TDL: type definition language
  - CaTTS-FDL: date format definition language
- CaTTS-CL: constraint language

CaTTS and the Semantic Web:

- theory reasoning not axiomatic reasoning
- for specific not for generic Semantic Web applications
- considerably simplifies the modeling of calendars
- provides a static type checker and type predicates for every calendar specification
- comes along with a constraint solver dedicated to calendars

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MPLL - Multi-Paradigm Location Language

Geospatial Reasoning is important for context adaptive (Web-) applications, because

- many scenarios pertain to geospatial data
- other types of information are often location dependent (timezones, calendar systems, etc.)
- it reduces the amount of data that is transferred to and from a mobile device
- ...your favourite reason here...

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MPLL - Goals

The Multi Paradigm Location Language (MPLL) aims for providing

- specification mechanism for location data
- advanced reasoning techniques
- extensible means of achieving these goals
- means to handle fuzzy geospatial notions

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MPLL - Benefits

MPLL will enable systems to answer queries such as:

- Where is the nearest pharmacy?
- Which movie theater near the restaurant shows "Mathilde" after 10 pm?
- Which route through the city is the quickest at this hour?
- Is the post office south of the train station?
- Which is the cheapest way to get to the airport?

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- dynamic extraction of traffic information (completed)
- Java based GUI (SVG, JavaScript) (planned for summer term)
- geospatial concepts and constructs (in progress)
- prototypical implementation of MPLL (in progress)

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References / Further Information

Please have a look at our website:

www.pms.ifi.lmu.de

or contact me directly:

lorenz@pms.ifi.lmu.de

Merci de votre attention

Vous pouvez poser vos questions...