The i-Disc

A Tool To Visualize and Explore Topic Maps

Tobias Hofmann
Hendrik Wendler Bernd Fröhlich

Bauhaus-Universität Weimar
Structure of the presentation

• Motivation
• Background on Topic Maps
• The i-Disc
• Construction, User Observation and Discussion
• Conclusion and Future Work
Motivation

• E-Learning Project in the field of Media
• CS, media design, economics
• Non-linear access to course material
• Use topic maps!
• Need for interface
What are topic maps (TM)?

- Topic? Typing Topic?
- Association?
- Occurrence?
Topics

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Topic Types

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Typing Topics – Class-Instance

TT-Country  TT-Opera  TT-City  TT-Composer

Class

„is-a“

Instance

Italy  Tosca  M.B.  Lucca  Rome  Puccini
Associations

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Topics and Associations

- **Classification:** „Grouping“, Hierarchy
  - Class-Instance
  - Superclass-Subclass
- **Class:** Typing Topics
- **Instances:** Leaf Nodes

Diagram:
- TT-Composer
- TT-City
- TT-Country
- Puccini
- Lucca
- Italy
Occurences

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TM Summary and Example

• Topological Structure
  – Node (Topic)
  – Arc (Association)
  – Pointer (Occurrence)

• Hierarchy (Class, Instance)

• (orthogonal) Associations

• Real World: Occurrence

- TT-Composer
- TT-City
- Puccini
- Lucca

ISBN:...
http://
Chapter, Section,...
Live Tour
Hierarchies

- Parse XTM-file
- Building in-memory TM
- Calculate number of hierarchies
Counting

- **Outer Ring:**
  - Equally spaced topics on outer ring

- **Middle Ring:**
  - Parent ~ Children
Sorting
The Application
The Application
The Application
The Application

Using Expat
by Clark Cooper
September 01, 1998

What is expat?

Expat is a library, written in C, for parsing
XML documents. It's the underlying XML
parser for the open source Mozilla project,
perfl XML Parser, and other open-
source XML parsers. As demonstrated in
my benchmark article, it's very fast. It also
sets a high standard for reliability,
robustness and correctness.
Implementation

Client

Browser

HTML
Blaxxun VRML Plugin

Server

XTM
In-Memory TM

I-Disc .WRL

HTTP/XMLRPC
Search
Visualisation
Limitations

• „Simple“ Hypergraphs, flat hierarchy
• Tree structure by design
• Associations mainly between leaves
• Scaling: 100 - ~1000 topics, three levels
Navigation

• Free spatial interaction
  → exhausting

• Viewpoints from different perspectives
  → Serious loss of orientation

• Animated transition, exploiting inertia effects
  → Enhancement, but still not convincing

Handle for manually rotating the map
Pilot user study

• Colleagues, staff, students (Total of 16)
• Do users accept this kind of presentation?
• Do users accept the interaction model?

• Concentric rings, rotation reported as "natural".
• Interaction with map seemed logical.
User Observations

- 10 mins work
- Sketch the i-Disc
- Point at „Standard“
- Sketch map, mention some structures.
- Point at "standard" in their own sketch.
- Three subdivided, structured rings
- Quick acquisition of coarse spatial layout
- They are not aware of 600 items!
Issues

• Connection to association labels: Another association?

• Occurrences not always memorized
Economics – Brand Theory
Conclusions

• Integration into web based applications
• Elementary design: Quick perception
• Interactive exploration: Access to details on demand
• Rotation: Motion Parallax
  → Understanding of 3D structure
Conclusions

• Perspective rendering:
  → Natural focus and context display
  → Easy to understand

• Separation: Orth. spatial dimensions:
  → Uncluttered visual representation.
  ++ Overview of map needed at all times
  ++ Only some assoc.s. simultaneously
Future Work

• ?: Reduce items displayed:
  – Use single texture
  – Display arcs on demand only.

• ?: Other domains: Graph can be separated into orthogonal structures:
  → Primary hierarchical, secondary linking

• Example: VRML-Scenegraph, orthogonal „Event Routes“ between SC nodes
Thank you