Data Enrichment for adaptive Generalisation

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outline

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2. data enrichment
   • horizontal and vertical relations
   • application using thematic maps, examples
3. research concept
   • work plan
   • first approaches
project & motivation

• DEGEN: Data Enrichment for adaptive Generalisation

• the 2 subprojects focus on:
  1. acquisition of enriched data, representation with MRDBs
  2. exploitation of enriched data and algorithms

• project members:
  Robert Weibel & Dirk Burghardt (Principle Investigators)
  Moritz Neun & Stefan Steiniger (PhD Students)

• funding: Swiss NSF, 04/2004 – 03/2007
project & motivation

- **application trends:**  
  - real-time mapping (web, LBS)  
  - on-demand production

- **supporting instruments:**  
  - data enrichment  
  - MRDB (multiple LODs)  
  - agents

- increasing importance of thematic mapping (polygons, POI)
Data enrichment

Initial aim:

*The purpose of DEGEN is the data enrichment, the modelling of the enriched data and the exploitation of this enriched data*

Focus on:

- thematic maps / GIS in a generic way
- integration of data enrichment and MRDB for generalisation
  → adaptive generalisation (Galanda & Cecconi)
data enrichment – terms & definitions

- **horizontal relationships**
  - single level of detail (LOD) only
  - common structural properties
    - (e.g. neighbourhood, pattern, alignment)
  - hierarchic partonomic relations

- **vertical relationships**
  - linking of objects and/or object groups on multiple LODs
  - hierarchic partonomic relations
data enrichment – application domain

thematic polygonal maps:
→ seamless (tessellation)
or
→ distributed polygons on a common background

important factors:
• attributes / semantics
• topology
• alignments (pattern)
• shape
• orientation
data enrichment – map examples

geological map

detailed:
1:10’000 - 1:50’000

overview:
1:500’000 - 1:1’000’000
data enrichment – map examples

geological map
alignment

1:500'000

1:25'000
data enrichment – map examples

soil map
broad range from
1:2’000 –
1:1’000’000

1:100’000

1:200’000
research concept

work plan

- analysis using example maps (patterns, alignments …)
- analysis and improvement of existing spatial technologies → object model
- modelling and managing of the relations in a MRDB → data model
- automatic identification / generation of horizontal and vertical relations (pattern recognition, object matching …)
- exploitation for generalisation → e.g. agents, incremental updates, on-the-fly generalisation
research concept – first approaches

map analysis:
e.g. land use map
research concept – first approaches

map analysis:
e.g. geological map
research concept – first approaches

representing alignments:
two parallel alignments of small polygons having the same orientation
map analysis - current questions:

- **which relations can be used for data enrichment?**
  (topology, neighbourhood order, orientation …)

- **how to extract horizontal relations?**
  (pattern recognition, alignments …)

- **how match objects, object groups?**
  (e.g. pattern, alignments) in different LODs for establishing vertical relations

- **how represent these relations?**
  → MRDB data model
Thanks a lot!

Any questions, suggestions or comments?