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Streamlined Workflow for Large-Scale Interactive Geographic Visual Analytics

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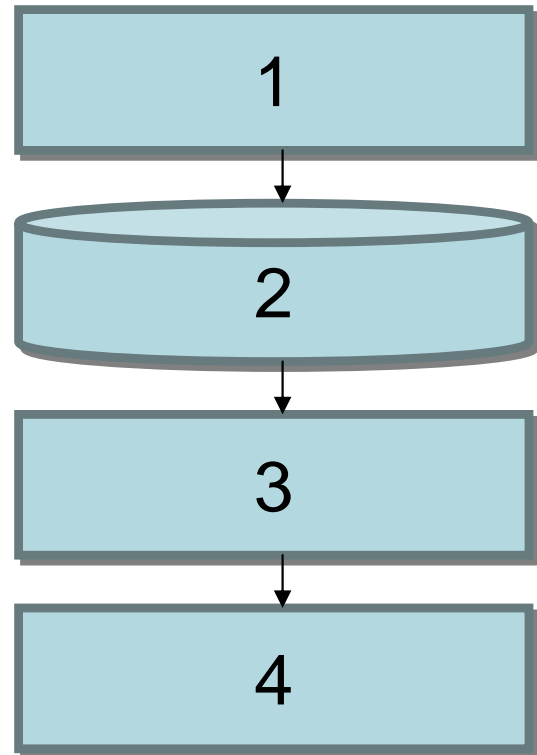
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Introduction

- **Objectives:**
 - **Effectiveness:** collaboration-centric
 - **Usability:** web-based
 - **Scalability:** updates on huge data sets
- **Collaboration:**
 - Interactive: performance!
 - Asynchronous: history!
- **Temporal:** revisions
- **Visual interaction:** SVG
- **Spatial:** geodata

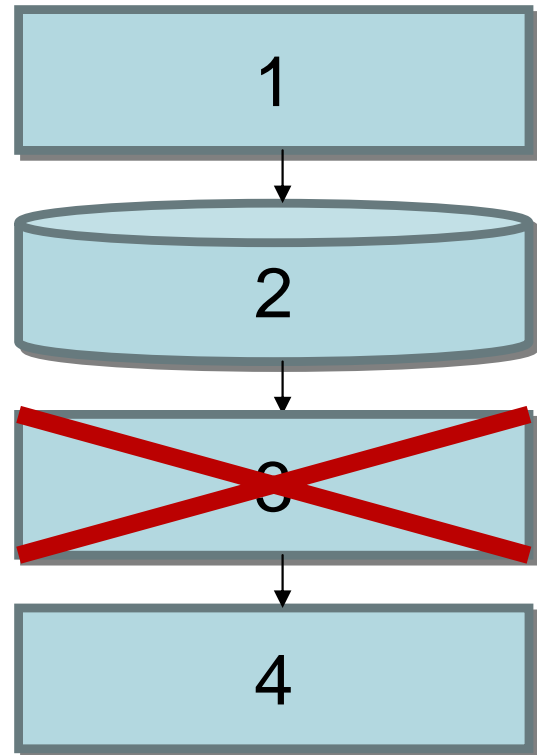
Theory

- **Three-step workflow:**
 - 1: SQL query
 - 2: Spatial database
 - 3: Standard Open Format
 - 4: SVG



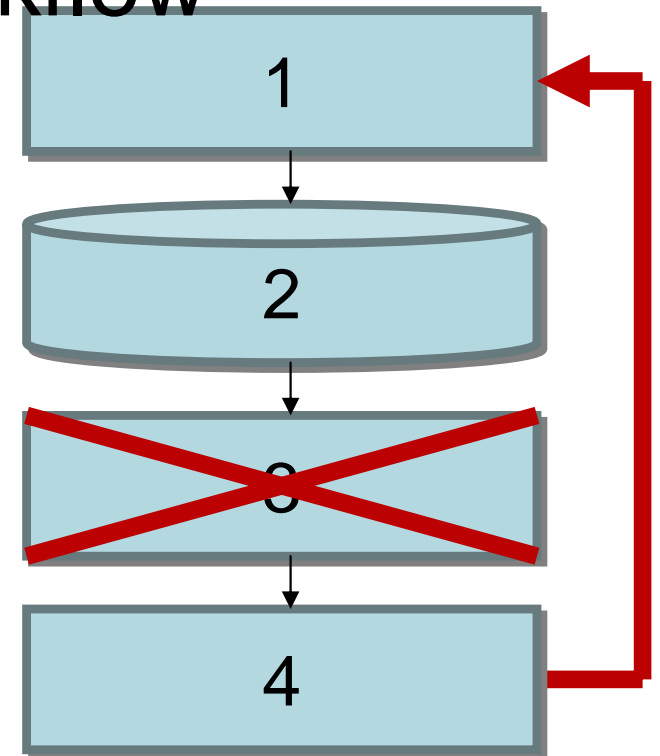
Theory cont.

- **Two-step** workflow
 - 1: XQuery
 - 2: XML database
 - 3: (dropped conversion)
 - 4: SVG



Theory cont.

- **Repetitive Two**-step workflow
 - 1: XQuery (**Update**)
 - 2: XML database
 - 3: (dropped conversion)
 - 4: SVG



- **KDD == KBD?**

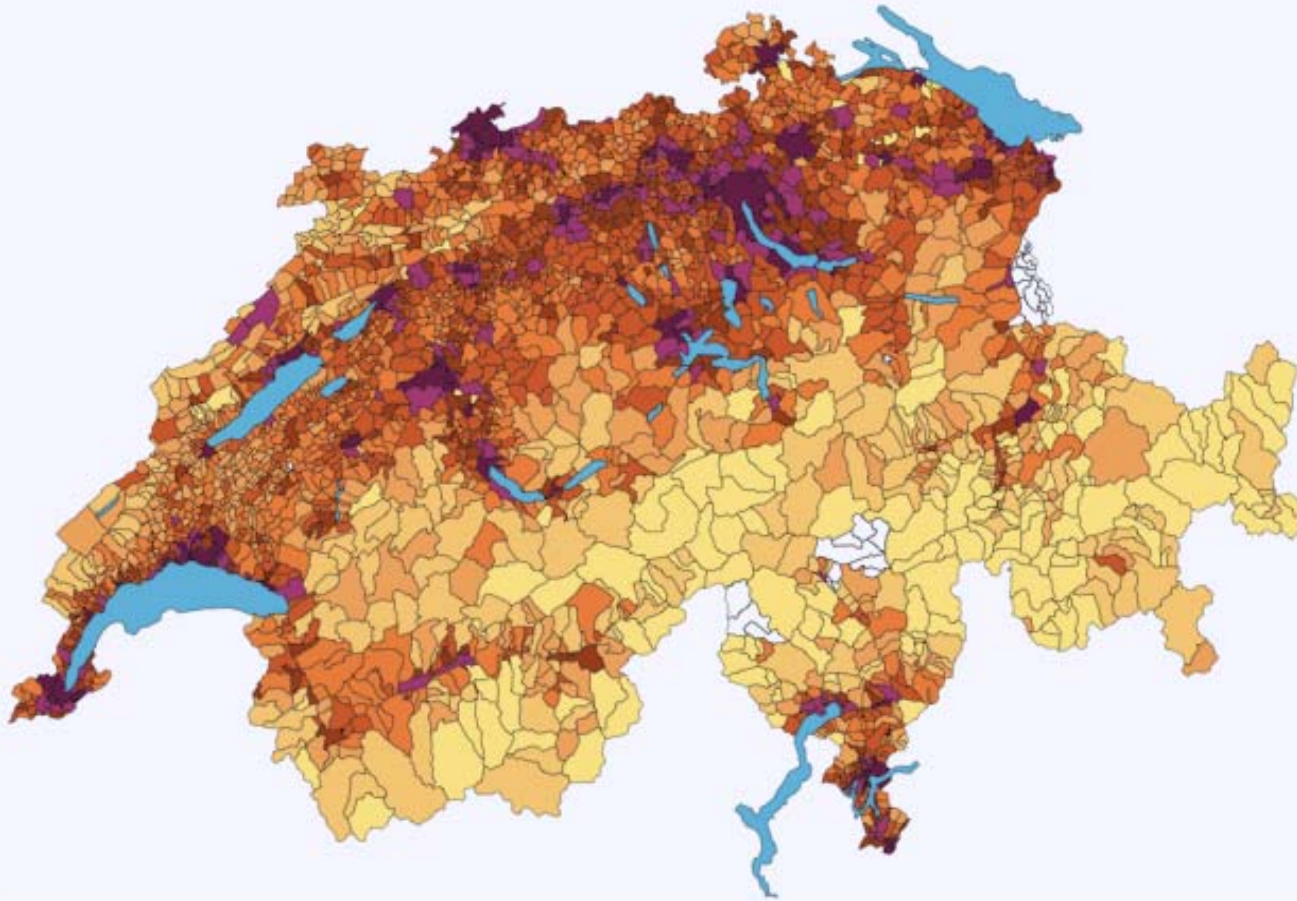
Methods

- **TreeTank:** native XML database
 - **Space-efficient** revision store
 - **Scalable** read/write access
 - **Secure & Mobile**
- **Temporal REST:** generic web interface
 - **Current** state
 - **Past** state
 - **Modifications** between two states
- **Web browser:** SVG plugin

Preliminary Results

- **TreeTank:**
 - **Time:** 2 to 30 times faster
 - **Space:** 1/2 to 1/10 of space
- **Web browser:**
 - **Time:** 2 to 3 times faster
 - **Updates:** As fast as reads

Population density of Switzerland from 1981 to 2006



Gemeinde Information

Name:

Surface (square kilometer):

Population:

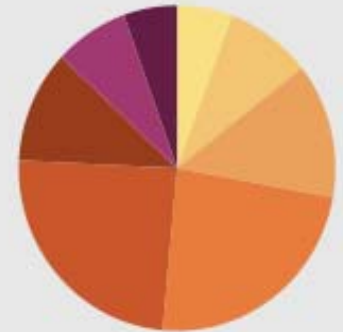
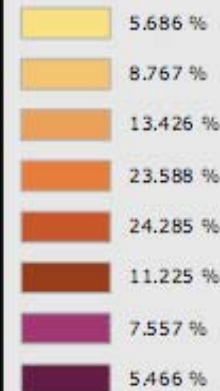
Year:

Search Gemeinde by Name

Search

Result:

Percentage of the Gemeinde per Population Density



Map Navigator



Statusbar: Mode: Infomode

Population Density

Habitants per square kilometer



per Gemeinden

Revisions

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Master Thesis

Student: Georgios Giannakaras

Supervisor: Marc Kramis

Professor: Marcel Waldvogel

Conclusions

- **+ Facilitate:**
 - knowledge building and communication
 - interface development for GIA (Java, SVG, ...)
- **+ Performance:**
 - Time
 - Space
- **- Frontend bottleneck, no longer backend**

Summary

- **Support** for collaborative knowledge building in large-scale (XML) (geo)data
- **Theory:**
 - Repetitive two-step workflow for KBD
- **Methods:**
 - TreeTank
 - Temporal REST
 - Web browser

References

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