



Project no.: RGI-233 Usable and well-scaled mobile maps for consumers

Management summary

The main research and technology ingredients in the current project RGI-233, Usable and well-scaled mobile maps for consumers, concern progressive transfer (between server and mobile client) based on generalization principles and smooth-zooming. One of the most active Universities in these areas is the Leibniz University of Hannover, with key researchers in this field Monika Sester, Jan Haurert and Claus Brenner. In the context of several (European) projects they have been working on related topics and it is therefore that the involvement of the Leibniz University of Hannover will very much strengthen the current RGI-233 project. The result of the proposed small international top-up project will be enhanced theory (published in joint scientific publications) and prototype implementations.

Leading organization

Organization: TU Delft- OTB

Contact for the top-up: Prof.dr.ir. Peter van Oosterom

Project consortium

- | | |
|---|-----------------|
| 1. TU Delft – Research Institute OTB – Section GIS Technology | existing member |
| 2. Leibniz University of Hannover (Sester, Haurert and Brenner) | new member |

Project extension

Until today no variable scale system does exist despite the obvious advantages for the user. Some initial theoretic ideas have been described (Generalized Area Partitioning; GAP-tree related, streaming generalization; mainly focusing on selection and simplification), but this is still initial research and no single organization has been able to realize such a solution. The theoretic ideas are not yet mature and should be further improved: support of point and line features (besides areas), support of dynamic updates, support of other generalization techniques besides selection/simplification (displacement, typification, etc.), support of good quality (application driven) tGAP structure creation, etc.

Proposed approach

It is widely known that automatic generalization, a 'classic problem' in geo-information handling and visualization, has only been solved partly. Also the specific conditions, which apply for mobile applications make it even more difficult: it should be suitable for interactive use (that is only the most detailed representation is maintained and all other requested representations are dynamically derived in an efficient manner) and suitable for progressive transfer (sending additional details to the client, which can be used to refine the initial more coarse representations). Mobile devices (such as PDAs, mobile phones, etc.) are perfect test cases for generalization as the displays are usually quite limited (and require very extreme generalization in combination with interaction, zoom-in/out, switch layers on/off, query for thematic attributes of selected objects, etc), especially for consumer applications.



At the Leibniz University of Hannover, related research is being conducted. Through close cooperation, the ideas (and prototype implementations in test environments) can be better exchanged. This also provides the basis for true joint research (though the main activities will be in the original projects and the top-up, will enable linking these activities). Part of the cooperation will be a number of visits, including a longer visit (of one month) of Jan Haurert to the TU Delft. By merging the on-gong research activities it is very likely that significant progress can be made. This concerns both the theoretic side as the more practical side; development of prototypes to provide a proof-of-concept. The goal of the progressive transfer/generalization approach is to offer the following advantages:

1. user gets very quickly a rough representation (and this is refined until the optimal level is reached for the given LoD/display)
2. when the users zooms in, additional detail is sent (and available information is re-used and does not have to be sent again)

This project has an important relationship with the current other project within Bsik RGI with a generalization component (RGI-002, Generation and use of base maps for integrated querying of digital physical development plans). At the Leibniz University Hannover several projects are dealing with generalization aspects. E.g. development of automatic generalization procedures, consistent generalization and updating of geodata, MRDB-generalization, as well as streaming, progressive generalization for the generation of seamless LoDs. Within INSPIRE the topic of generalization, handling multiple representations (in a consistent manner), is also very high on the agenda (for example a workshop on this topic is planned at JRC, Ispra, Italy on 7 and 8 November 2006, where both Van Oosterom and Sester are invited as experts). From the base project RGI-233 and the top-up project input to INSPIRE will be provided. The envisaged project output includes 1. the specification of the requirements for vario-scale servers, progressive transfer and smooth zooming (and their interrelationships), 2. the inventory of currently proposed solutions and techniques (for a large extend developed by Leibniz University Hannover and TU Delft, but also by others), 3. further develop additional solutions were needed, 4. test improved solution in prototype environment (by enriching the RGI-233 prototype), 5. document the results in publications (scientific and professional) and include new knowledge in MSc level education.

Securing knowledge and communication

The (Interim) results of the project will be communicated via publications in professional papers (both German and Dutch magazines) and scientific journals (e.g. International Geographical Information Science and International Journal of Applied Earth Observation and Geoinformation) and via presentations on (inter)national conferences. All publications (reports, etc.) will be open for the public via the website <http://www.gdmc.nl/uwsm2/> that contains an up-to date recording of relevant project information (both the current project and the project extension). The work will also be included in current and future PhD-thesis. Furthermore, it will be the basis for the acquisition of new projects.

Bsik grant

- X Less than 50 k euros (if only RGI partners involved)

Plan

Start date: January 1, 2007



End date: December 31, 2008

Appendices

- *Estimate in accordance with accompanying spreadsheet*
Attached
- *If not yet available to RGI: signed admission agreements (see Appendix 5).*
Attached