

## **MASTER DEGREE THESIS**

Spring 2012  
for

Student: Robert P. V. Nordan

### **An Investigation of Potential Methods for Topology Preservation in Interactive Vector Tile Map Applications**

#### **BACKGROUND**

Vector tiling is a new trend that the geospatial industry is likely to explore in coming years, bearing the promise of the advantages in clarity and interactivity afforded by vector data whilst also providing a cacheable and efficient solution akin to raster tiles. An important question is then to ascertain how one might ensure that metadata is preserved across tiles; i.e. how does one convey the fact that two lines on adjacent tiles are in fact part of the same road?

#### **TASK DESCRIPTION**

- Assess current vector tile solutions.
- Create hypothetical solutions for topology preservation.
- Create prototypes and test with regard to speed and functionality.
- Draw conclusions about topology preservation.
- Discuss possibility of using vector tiles for GIS tasks

#### **General about content, work and presentation**

The text for the master thesis is meant as a framework for the work of the candidate. Adjustments might be done as the work progresses. Tentative changes must be done in cooperation and agreement with the professor in charge at the Department.

In the evaluation thoroughness in the work will be emphasized, as will be documentation of independence in assessments and conclusions. Furthermore the presentation (report) should be well organized and edited; providing clear, precise and orderly descriptions without being unnecessary voluminous.

The report shall include:

- Standard report front page (from DAIM, <http://daim.idi.ntnu.no/>)

- Title page with abstract and keywords.(template on: <http://www.ntnu.no/bat/skjemabank>)
- Preface
- Summary and acknowledgement. The summary shall include the objectives of the work, explain how the work has been conducted, present the main results achieved and give the main conclusions of the work.
- Table of content including list of figures, tables, enclosures and appendices.
- If useful and applicable a list explaining important terms and abbreviations should be included.
- The main text.
  - Clear and complete references to material used, both in text and figures/tables. This also applies for personal and/or oral communication and information.
  - Text of the Thesis (these pages) signed by professor in charge as Attachment 1..
- The report must have a complete page numbering.

Advice and guidelines for writing of the report is given in: "Writing Reports" by Øivind Arntsen. Additional information on report writing is found in "Råd og retningslinjer for rapportskriving ved prosjekt og masteroppgave ved Institutt for bygg, anlegg og transport" (In Norwegian). Both are posted on <http://www.ntnu.no/bat/skjemabank>

### Submission procedure

Procedures relating to the submission of the thesis are described in DAIM (<http://daim.idi.ntnu.no/>). Printing of the thesis is ordered through DAIM directly to Skipnes Printing delivering the printed paper to the department office 2-4 days later. The department will pay for 3 copies, of which the institute retains two copies. Additional copies must be paid for by the candidate / external partner.

On submission of the thesis the candidate shall submit a CD with the paper in digital form in pdf and Word version, the underlying material (such as data collection) in digital form (eg. Excel). Students must submit the submission form (from DAIM) where both the Ark-Bibl in SBI and Public Services (Building Safety) of SB II has signed the form. The submission form including the appropriate signatures must be signed by the department office before the form is delivered Faculty Office.

Documentation collected during the work, with support from the Department, shall be handed in to the Department together with the report.

According to the current laws and regulations at NTNU, the report is the property of NTNU. The report and associated results can only be used following approval from NTNU (and external cooperation partner if applicable). The Department has the right to make use of the results from the work as if conducted by a Department employee, as long as other arrangements are not agreed upon beforehand.

### Tentative agreement on external supervision, work outside NTNU, economic support etc.

Separate description to be developed, if and when applicable. See <http://www.ntnu.no/bat/skjemabank> for agreement forms.

**Health, environment and safety (HSE)** <http://www.ntnu.edu/hse>

NTNU emphasizes the safety for the individual employee and student. The individual safety shall be in the forefront and no one shall take unnecessary chances in carrying out the work. In particular, if the student is to participate in field work, visits, field courses, excursions etc. during the Master Thesis work, he/she shall make himself/herself familiar with "Fieldwork HSE Guidelines". The document is found on the NTNU HMS-pages at <http://www.ntnu.no/hms/retningslinjer/HMSR07E.pdf>

The students do not have a full insurance coverage as a student at NTNU. If you as a student want the same insurance coverage as the employees at the university, you must take out individual travel and personal injury insurance.

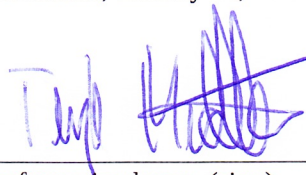
**Start and submission deadlines**

The work on the Master Thesis starts on January 16, 2012

The thesis report as described above shall be submitted digitally in DAIM at the latest at 3pm June 11, 2012

Professor in charge: Terje Midtbø

Trondheim, January 16, 2012. (revised: 07.06.2012)



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Professor in charge (sign)