



In Prague, 6.1.2015

Review of a ~~MASTERS~~ thesis

Author of the thesis: Tomáš Těthal

Topic of the thesis: Trip Connection Searching Algorithm / Algoritmus pro vyhledávání dopravního spojení

Department: K620 - Department of Transport Telematics

Study field: (3711T004) Inteligentní dopravní systémy

Formal aspects

Mr. Těthal focused in his thesis on Trip Connection Searching Algorithm. The English language used by the author is on a good level. There are some small mistakes with missing articles and similar issues, but it does not affect understanding of the overall meaning of the thesis.

There are however several formal issues that would need improvement:

- The variables used in the thesis do not always have units provided (for example “max speed” in Table 1.1). Additionally, the units should be used in a consolidated way, for example in parenthesis and not directly as part of the variable (for example “length (km)” instead of “length km” in table 1.1). The Table 1.1. is also not referenced properly in text.
- Not all variables or coefficients used in equations are properly described in text. In most cases, a better explanation would be useful as well.
 - For example in Chapter 2.2:
 - Description of time format includes coefficients a and b , taking some values (clearly number of days within a year and number of hours within a day), which are however not described in text.
- The links in general are not clear. For example: “...connections such as 5.4.” does not clearly says that it refers to a chapter 5.4.
 - There are also several missing links and references, for example on page 38 “Nguyen and Palatino in 1988-1989 [33] ??”, or page 46 “in chapter ??.”

Meeting of the objectives

The document is structured properly. Next to literature review and problem formulation, chapter 4 provided detailed overview of different existing algorithms. This is sufficiently done. It is possible to determine that the author found and studied the most relevant publications in the field. I was

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missing discussion about why the Trip Based Shortest-Path algorithm was selected for the implementation. I would however expect more discussion and personal insight into the algorithms. Chapter 5 is probably the most crucial one. First, a general description of the different technologies, such as Java or SQL is provided. When describing the different tables and the software application, some structured description of the databases and the software would be recommended. A list of tables does not show the relations among the particular tables and the overall DB structure. An E-R diagram, class diagram or some other UML diagrams would be suitable for such task. In my understanding, the thesis implemented an existing algorithm to the data available in the city of Prague. The author however does not discuss the actual optimisations and improvements of the used algorithms.

Summary

Overall, the author certainly fulfils the goals stated for this thesis. It is clear, that the author spent a lot of time working on the data and the application. This is also based on a good theoretical framework. A little more focus should have been dedicated to the actual work on the thesis. More personal discussion about interesting or problem areas would certainly improve the thesis as well. It is not exactly clear, what is adopted from the work of others and what issues were really solved by the author.

Recommended overall mark for the thesis: C (good)

S přátelským pozdravem,

Doc. Ing. Ondřej Příbyl, Ph.D.

Questions:

1. The author states that: " The algorithm is based on the Trip Based Shortest-Path (TBSP) algorithm originally proposed by Nguyen and Palatino but improved in order to achieve a more efficient shortest-path search on large networks." What improvements were adopted? What is the author's main contribution?
2. As I understood, the algorithm was tested for separated requests. In praxis, the biggest problem concerned with the response time is through multiple parallel requests performed simultaneously. I understood that the author is aware of this fact and considers it to be his future work. I am not sure that in a situation when a single request takes about 600ms the algorithm would perform sufficiently in a real situation of multiple requests simultaneously. Have you done some preliminary testing with respect to this issue? Do you believe it is going to work?