THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Personalized route planning using machine learning.**
Author's name:	**Temirlan Kurbanov.**
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Computer Science.
Thesis reviewer:	Doc. Ing. Jiří Kléma, PhD.
Reviewer's department:	Department of Computer Science.

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	**challenging**

How demanding was the assigned project?

The thesis focuses on personalized route planning, the goal is to recommend the route that is most convenient for the user (driver) rather than simply the shortest route. The main challenge is to properly understand and formalize the heterogeneous route preferences and treat them efficiently, which mainly means the ability to find optimal routes in large maps.

Fulfilment of assignment	**fulfilled with minor objections**

How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.

The assignment was to learn the existing approaches to personalized route planning and formalize, implement and test an own algorithm for personalized route planning. The assignment was fulfilled, the only deviation can be seen in the fact that the author since the very beginning focuses on shortest path algorithms. The personalized route planning is discussed later in terms of modifications of these algorithms. I do not specialize in the domain of personalized route planning, however, I have doubts whether the introductory discussion and review is thus complete. It seems that at least some reasonably referenced papers stayed omitted (trajectory data mining, multi-criteria decision making that goes beyond simple linear criterions, etc.).

Methodology	**correct**

Comment on the correctness of the approach and/or the solution methods.

The author proposed a methodology that works with a simple vector-based linear representation of route preferences. The preferences are set in such a way that the planned routes would approach as much as possible the previous trajectories selected by the driver/biker. Still, the whole framework is not trivial as the author needs to solve the efficiency issues and consider the availability and representativeness of the available real training data. In my opinion, the selected methodology is appropriate for the given problem and the author clearly discusses its limitations.

Technical level	**B - very good.**

Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?

I appreciate the proposed framework, namely the main idea to closely integrate the preference extraction with the global path optimization algorithm. On the other hand, I doubt that the proposed path similarity function (page 20) is sufficiently general, under the existing definition, even a small path perturbation can bring severe dissimilarity between a pair of paths. Also, the evaluation of the work remains ambiguous. The theoretical experiment brings an expectable outcome while the real experiment shows that the true application of the current algorithm remains non-trivial. In my opinion, the experiments should definitely be comparative. How the proposed algorithm works in comparison with a trivial preference extraction method (none, simple guesses based on averaging and deviations from these averages, …)?

Formal and language level, scope of thesis	**A - excellent.**

Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?

Overall, the thesis is presented very well. It was written in nice and fluent English, the global concepts are clear. There are only some minor clear omissions (figure annotations, etc.). On the other hand, the thesis could have been longer with a more detailed description in the experimental part.

Selection of sources, citation correctness	**B - very good.**
Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?	
The selection of sources was adequate with the exception mentioned in the previous paragraph on fulfilment of the assignment. There is one more minor note, the bibliographic citations are not perfectly uniform.	

Additional commentary and evaluation (optional)
Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.
Please insert your comments here.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

This is a very good work on a very current and non-trivial topic. It meets the requirements of the assignment and despite minor shortcomings it fulfills the general requirements for the master's thesis. The grade that I award for the thesis is **B - very good.**

Questions: Would you clearly state your contribution? How does your algorithm compare with the previous efforts on personalized route recommendation? How would it perform in comparison with naïve recommendations proposed above (a uniform preference vector, simple heuristics)?

Date: **11.6.2020**   Signature: