

Assessment of the master thesis by Holger Nießner

Streaming Novelty Detection in Telemetry Data

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This is the second assessment of the thesis after improvements that were required for the second review. I will comment on the changes and improvements only.

Regarding chapter 2, I was asking for clarification w.r.t. to the recent papers on novelty detection:

Weinshall et al. Beyond Novelty Detection: Incongruent Events, When General and Specific Classifiers Disagree. IEEE Transactions on Pattern Analysis and Machine Intelligence, Volume: 34, Issue: 10, Oct. 2012.

Josef Kittler et al. Domain Anomaly Detection in Machine Perception: A System Architecture and Taxonomy. IEEE Transactions on Pattern Analysis and Machine Intelligence, Year 2014, Volume 36, Issue 5

Yet, again, none of the papers was mentioned in the thesis and no comments were added.

Regarding chapter 3, it is still verbatim equal to the previous version. There is no improvement.

Chapter 4 was most lacking on the previous version of the thesis. On the positive side, a paragraph explaining the motivation for using distributed computing was added and Chapter 4 has been split to two chapters. Still, not much new detail has been added.

New chapter 5 mostly contains the content of previous chapter 4. On the positive side, the new algorithm has been at least described in more detail and some reasoning about engineering choice has been added. I believe that it is still far below the standard of good engineering work but it at least provides the minimal information needed to repeat the work.

Chapter 6, Evaluation (previously chapter 5) has not changed. None of my previous requirements has been addressed and no improvement has been presented.

The thesis is in my opinion still not acceptable under normal situation. After half a year of additional work, only very little has been improved. At some point I was communicating to Holger that I am happier with the description of the algorithm but I assumed that more would be improved in the experimental chapter too. The thesis is really on the bottom of our scale but since it is at least become reproducible, I suggest accepting it and grade it by *grade E (sufficient)*.

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CTU Diploma Project review- 2nd reviewer's evaluation of master thesis with title
"Streaming Novelty Detection in Telemetry Data " by Space Master student Holger Niessner.

I find that the *goal* of the thesis project well fulfils the requirements of a master thesis in space technology. The work concerns building part of a system for identifying and presenting the presence of outliers in data streamed from a satellite.

The thesis includes databases, distributed computing and other subjects not part of the main path for the Space Master education. Through the thesis project work the student has shown that he has been able to work with new tasks learning new concepts within a limited time.

Concepts used in the thesis is presented, but the level of detail is varying, where sometimes trivial concepts are described more in detail than is needed, whereas concepts more important for understanding the problem is presented briefly. It is therefore difficult at some places to, from the presentation, see if the student has a deep understanding of the concepts or not. The student has put in a sufficient effort into the task: he has built up a complete system and also evaluated the result to some extent.

The evaluation of the implementation and the discussion of the result is somewhat weak (Chapter 6). The thesis would have benefited from a comparison and rate of false positives since this is of importance for the operators work load. It is also unclear to what extent outliers are missed.

The project is mainly built up (designed) using existing building blocks but the student has improved parts of the software bottlenecks thereby improving the performance. This is described in chapter 5.

The result of the thesis project contributes to a future solution to the problem addressed, as discussed by the student in the last chapter.

Based on the review above I recommend to grade the thesis by C(*good*). The oral presentation is still to be graded.

This review serves solely for the purposes of the diploma project defense at CTU. LTU official evaluation for the SpaceMaster double degree will follow the thesis defense and may differ from this review report and suggested grade.

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