



Bachelor thesis opponent's review

Master thesis: "Optimization of Machine Learning for the Leptoquark Search Using CERN ATLAS Data"

Author: Mr. Janick Böhm.

Thesis supervisor: Doc. Dr. André Sopczak

Thesis opponent: Dr. Vlasios Petousis

Rating (1 – 5)
(1 = best; 5 = worst):

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|--|--------------------------------|
| 1. Fulfillment of assignment requirements: | <input type="text" value="1"/> |
| 2. Systematic solutions of individual tasks: | <input type="text" value="1"/> |
| 3. Ability to apply knowledge and to use literature: | <input type="text" value="1"/> |
| 4. Thesis formal and language level: | <input type="text" value="2"/> |
| 5. Thesis readability and structuring: | <input type="text" value="2"/> |
| 6. Thesis professional level: | <input type="text" value="2"/> |
| 7. Conclusions and their formulation: | <input type="text" value="2"/> |
| 8. Final mark evaluation (A, B, C, D, E, F): | <input type="text" value="B"/> |

verbal:

Brief summary evaluation of the thesis (compulsory):

As the author points out, the same topic introduced first in the year 2022 by Mr. Lukas Vacinek in his bachelor thesis. This new work on the optimization, produces limits slightly different than the previous work, showing that the lower masses having a higher expected limit compared to larger ones. The main reason for that (as the essay concludes), could be possibly that the used models cannot make a clear signal separation at lower masses. To my opinion it's another step forward, but I think that a lot of additional work is needed to benefit from using this way of analyzing data for leptoquarks.

Questions:

1. What could be done next for even better optimization in order to overcome the mass issue?

Date: 05/06/2023

Signature:

Notes:

- 1) The total thesis evaluation needn't be determined by the partial evaluations average.
- 2) The total evaluation (item 8) should be from the following scale:

excellent	very good	good	satisfactory	sufficient	insufficient
A	B	C	D	E	F