I. IDENTIFICATION DATA

Thesis name:	Axion-Like-Particle Search Using Machine Learning for the Signal Sensitivity Optimization with Run-2 LHC Data Recorded by the ATLAS Experiment
Author's name:	Ondrej Matoušek
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Cybernetics
Thesis supervisor:	Doc. Dr. André Sopczak
upervisor's department:	IEAP CTU in Prague

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	**challenging**
For a bachelor thesis the topic has been very challenging, as besides the actual thesis tasks, the project required the student to get familiar with several software packages used at CERN in the ATLAS collaboration.	

Satisfaction of assignment	**fulfilled**
The thesis fulfills all assigned tasks.	

Activity and independence when creating final thesis	**A - excellent.**
The student showed great independence in fulfilling the tasks throughout the project.	

Technical Level	**B - very good.**
The student experience with the use of the provided data and applied his knowledge very well. The technical execution was straightforward. Testing of the software, and cross-checks of the results were performed. The documentation could have been extended to facilitate further use.	

Formal and language level, scope of thesis	**A - excellent.**
The thesis fulfills a high standard and is well structured.	

Selection of sources, citation correctness	**B - very good.**
Citations and resources are given in a correct and coherent format. Citation ethics has been fulfilled.	

Additional commentary and evaluation
The primary goal to apply machine learning for an analysis which used previously sequential cut selections was fulfilled. In the scope of a bachelor thesis best possible results were obtained. The technical realization was led to convincing results.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

The efficiency of the selection was significantly improved over almost the whole mass range of the axion-like particle. The performance at the lowest mass was less than expected, and the student solved this problem by increasing the weight of the low mass in the training. He nicely demonstrated that his solution increased the performance also for the lowest mass. The thesis quality was high already in the first provided version. The student has been very attentive and performed consistently very well throughout the project. He presented his returns at group meetings regularly, and also presented preliminary results at the student session of the German Physical Society meeting in Dresden in March 2023.

I evaluate handed thesis with classification grade **A - excellent.**

Date: **7.6.2023**   Signature: