



# Review report of a final thesis

**Reviewer:** Ing. Michal Valenta, Ph.D.  
**Student:** Bc. Petr Fiedler  
**Thesis title:** Systematic Comparison of TPX and TPX3 devices regarding luminosity measurements in the ATLAS cavern  
**Branch / specialization:** Web and Software Engineering, specialization Software Engineering  
**Created on:** 31 May 2021

## Evaluation criteria

### 1. Fulfillment of the assignment

- ▶ [1] assignment fulfilled
- [2] assignment fulfilled with minor objections
- [3] assignment fulfilled with major objections
- [4] assignment not fulfilled

The work fulfilled all partial goals. The quality of analysis, design, and implementation is high.

### 2. Main written part

92 / 100 (A)

The structure of the text is usually for the implementation type thesis. Chapter one contains a context introduction into necessary physics aspects of the work as well as a basics explanation of files produced by devices that have to be processed by the program. The next chapter - named "As is" - provides the review of the actual state of the set of routines that implement the data processing. The next chapter provides analysis and design of a new - i.e. well-designed, extensible, maintainable, and optimized - set of routines. This chapter is the core of the work. Chapter four is dedicated to the implementation of the prototype, its deployment, and evaluation.

The text is well-readable even the topic itself is complex. I highly appreciate the usage of UML - namely class and activity diagrams to describe the structures and their processing. All chapters are relevant to the topic and their content and level of detail are sufficient. The size of the text is over average, which is partly affected by the complexity of the system. The text fulfills all formal requirements to master thesis including an over-average amount of well-formed citations.

### **3. Non-written part, attachments**

100 /100 (A)

The main results of the thesis are the detailed design of the system and its functional prototype - the new set of routines that processes input data from devices and provides a review of results also in a graphical form. Routines are implemented in the C++ language. I highly appreciated the author's skills in C++ advanced features. All routines are well-designed and the system is extensible and maintainable.

### **4. Evaluation of results, publication outputs and awards**

95 /100 (A)

The functional prototype of the new system had been deployed and tested in a target environment - the CERN computation ecosystem. It is documented in chapter four of the thesis the prototype has fewer memory requirements and seems to be more than five times faster than the previous system. It is a nice result. In my opinion, yet more valuable is the whole concept of the system - its extensibility and maintainability.

### **The overall evaluation**

95 /100 (A)

Autor did a nice piece of software engineering work. Both the documentation and the code are of high quality. The result is already deployed on a target environment and it was shown it brings nice improvements in the processing of data produced from measure devices.

### **Questions for the defense**

I am aware, you got an internship position at CERN. What is the plan for the further development of the system? Do you plan to extend the team o people working on the system?

## **Instructions**

### **Fulfillment of the assignment**

Assess whether the submitted FT defines the objectives sufficiently and in line with the assignment; whether the objectives are formulated correctly and fulfilled sufficiently. In the comment, specify the points of the assignment that have not been met, assess the severity, impact, and, if appropriate, also the cause of the deficiencies. If the assignment differs substantially from the standards for the FT or if the student has developed the FT beyond the assignment, describe the way it got reflected on the quality of the assignment's fulfilment and the way it affected your final evaluation.

### **Main written part**

Evaluate whether the extent of the FT is adequate to its content and scope: are all the parts of the FT contentful and necessary? Next, consider whether the submitted FT is actually correct – are there factual errors or inaccuracies?

Evaluate the logical structure of the FT, the thematic flow between chapters and whether the text is comprehensible to the reader. Assess whether the formal notations in the FT are used correctly. Assess the typographic and language aspects of the FT, follow the Dean's Directive No. 26/2017, Art. 3.

Evaluate whether the relevant sources are properly used, quoted and cited. Verify that all quotes are properly distinguished from the results achieved in the FT, thus, that the citation ethics has not been violated and that the citations are complete and in accordance with citation practices and standards. Finally, evaluate whether the software and other copyrighted works have been used in accordance with their license terms.

### **Non-written part, attachments**

Depending on the nature of the FT, comment on the non-written part of the thesis. For example: SW work – the overall quality of the program. Is the technology used (from the development to deployment) suitable and adequate? HW – functional sample. Evaluate the technology and tools used. Research and experimental work – repeatability of the experiment.

### **Evaluation of results, publication outputs and awards**

Depending on the nature of the thesis, estimate whether the thesis results could be deployed in practice; alternatively, evaluate whether the results of the FT extend the already published/known results or whether they bring in completely new findings.

### **The overall evaluation**

Summarize which of the aspects of the FT affected your grading process the most. The overall grade does not need to be an arithmetic mean (or other value) calculated from the evaluation in the previous criteria. Generally, a well-fulfilled assignment is assessed by grade A.