Supervisor's statement of a final thesis

Student:	Bc. Jiří Vycpálek
Supervisor:	MSc. Benedikt Ludwig Bergmann
Thesis title:	Web based visualization of latest generation hybrid active pixel detector data
Branch of the study:	Web and Software Engineering

Date: 22. 7. 2016

Evaluation criterion:	The evaluation scale: 1 to 5.
1. Difficulty and other comments on the assignment	1 = extremely challenging assignment, **2 = rather difficult assignment,** 3 = assignment of average difficulty, 4 = easier, but still sufficient assignment, 5 = insufficient assignment

Criteria description:
Characterize this final thesis in detail and its relationships to previous or current projects. Comment what is difficult about this thesis (in case of a more difficult thesis, you may overlook some shortcomings that you would not in case of an easy assignment, and on the contrary, with an easy assignment those shortcomings should be evaluated more strictly.)

Comments:

I do not feel comfortable evaluating the difficulty of the work, since I cannot compare the tasks to others, the student with other students of the FIT, and it is not my main field of expertise. When filling this questionaire, I was comparing Jiri to students, I have cosupervised in the field of Physics at the University of Erlangen-Nuremberg.

The thesis assignment comprised low level programming in C++ for data preprocessing. In this stage, an appropriate database system in the ROOT-format was designed. The main reason for the choice of the ROOT framework was that researchers at the IEAP are familiar with it. High level programming was required for the frontend part, and an innovative solution was needed to integrate the front- and the backend. Jiri was working independently and all achievements were accomplished without much supervision. He was capable of implementing new features and all requested changes by quickly understanding the needs of the end user.

Evaluation criterion:	The evaluation scale: 1 to 4.
2. Fulfilment of the assignment	1 = assignment fulfilled, **2 = assignment fulfilled with minor objections,** 3 = assignment fulfilled with major objections, 4 = assignment not fulfilled

Criteria description:
Assess whether the thesis meets the assignment statement. In Comments indicate parts of the assignment that have not been fulfilled, completely or partially, or extensions of the thesis beyond the original assignment. If the assignment was not completely fulfilled, try to assess the importance, impact, and possibly also the reason of the insufficiencies.

Comments:

The thesis task was fullfilled by delivering a functioning web based data visualization and analysis tool for the pixel detector data. The tool was delivered in time. However, it is not yet deployed on a server and no user testing could be performed.

Evaluation criterion:	The evaluation scale: 1 to 4.
3. Size of the main written part	**1 = meets the criteria,** 2 = meets the criteria with minor objections, 3 = meets the criteria with major objections, 4 = does not meet the criteria

Criteria description:
Evaluate the adequacy of the extent of the final thesis, considering its content and the size of the written part, i.e. that all parts of the thesis are rich on information and the text does not contain unnecessary parts.

Comments:

I consider the lenght of the thesis, the content, and text to be sufficient. All methods are explained in quite detail. Mostly, the language is clear and to the point. For my personal taste, the Section "Analysis and design" could have been more straight.

Evaluation criterion:	The evaluation scale: 0 to 100 points (grade A to F).
4. Factual and logical level of the thesis	80 (B)

Criteria description:
Assess whether the thesis is correct as to the facts or if there are factual errors and inaccuracies. Evaluate further the logical structure of the thesis, links among the chapters, and the comprehensibility of the text for a reader.

Comments:

The structure of the thesis was logic and a good guidance is given for the reader. The text is understandable and the level of English is good. As far as I am concerned no factual mistakes could be found.

Evaluation criterion:	The evaluation scale: 0 to 100 points (grade A to F).
5. Formal level of the thesis	85 (B)

Criteria description:
Assess the correctness of formalisms used in the thesis, the typographical and linguistic aspect s, see Dean's Directive No. 12/2014, Article 3.

Comments:

The thesis structure, layout and formalism was completely up to Jiri. When I received the first draft, it was already on a sophisticated level and only minor adaptions, which were spelling mistakes or the insertion of articles were requested by me.

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
6. Bibliography	*90 (A)*

Criteria description:
Evaluate the student's activity in acquisition and use of studying materials in his thesis. Characterize the choice of the sources. Discuss whether the student used all relevant sources, or whether he tried to solve problems that were already solved. Verify that all elements taken from other sources are properly differentiated from his own results and contributions. Comment if there was a possible violation of the citation ethics and if the bibliographical references are complete and in compliance with citation standards.

Comments:

The literature research was done very accurately and independently. It exceeded the suggested references by far. The citations were assigned carefully and the Bibliography meets the scientific standard, so that all given sources can easily be found and verified.

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
7. Evaluation of results, publication outputs and awards	*75 (C)*

Criteria description:
Comment on the achieved level of major results of the thesis and indicate whether the main results of the thesis extend published state-of-the-art results and/or bring completely new findings. Assess the quality and functionality of hardware or software solutions. Alternatively, evaluate whether the software or source code that was not created by the student himself was used in accordance with the license terms and copyright. Comment on possible publication output or awards related to the thesis.

Comments:

The thesis was not aimed at new findings. The task was to create a working application, which can be used by the researches of the IEAP and CERN. This task was fullfilled as discussed above.

Evaluation criterion:	*No evaluation scale.*
8. Applicability of the results	

Criteria description:
Indicate the potential of using the results of the thesis in practice.

Comments:

The web visualization should be used as a standard tool to evaluate the data taken with latest generation pixel detectors (Timepix3). Since these detectors are currently still in the R&D phase, the range of possible applications can only be estimated. Such applications are, e.g., the monitoring of radiation levels in, or around nuclear reactors, aboard spacecrafts, or in the LHC (large hadron collider) at CERN. In the latter, they will be used even to provide valuable information about the machine status. Apart from these, Timepix3 detectors can be used for medical imaging and for quality assurance measurements in radiotherapy (or hadron therapy). We therefore expect the use mainly in the academic sector. Since for the different applications specialized methods of data analysis are needed, Jiri will continue working with the IEAP to share his experience and help improving the application by implementing additional functionalities.

Evaluation criterion:	*The evaluation scale: 1 to 5.*
9. Activity and self-reliance of the student	*9a:* *1 = excellent activity,* *2 = very good activity,* ***3 = average activity,*** *4 = weaker, but still sufficient activity,* *5 = insufficient activity* *9b:* *1 = excellent self-reliance,* *2 = very good self-reliance,* ***3 = average self-reliance,*** *4 = weaker, but still sufficient self-reliance,* *5 = insufficient self-reliance.*

Criteria description:
Review student's activity while working on this final thesis, student's punctuality when meeting the deadlines and consulting continuously and also, student's preparedness for these consultations. Furthermore, review student's independency.

Comments:

The overall activity of the student was satisfactory. He met the deadlines (mostly soft deadlines) and was able to demonstrate his progress in the meetings. Since, I have spend a significant amount of time on business trips, it was not often easy to find dates for a consultation. Jiri managed well to work self-reliant and did not need much supervision.

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
10. The overall evaluation	*80 (B)*

Criteria description:
Summarize the parts of the thesis that had major impact on your evaluation. The overall evaluation **does not** have to be the arithmetic mean or any other formula with the values from the previous evaluation criteria 1 to 9.

Comments:

Jiri has done a gook work. He has easily been integrated into an international team of physicists and engineers. He was working efficiently and independently. He could understand the tasks and solve the problems quickly.

Signature of the supervisor: