Supervisor's statement of a final thesis

Czech Technical University in Prague   **Faculty of Information Technology**

Student:	Bc. Patrik Staš
Supervisor:	doc. Ing. Carlos Humberto Granja, Ph.D.
Thesis title:	Directional visualization of trajectories of energetic space radiation particles
Branch of the study:	Computer Science

Date: 25. 1. 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:
The subject of the thesis (BP) is devoted to part of the evaluation of extensive and novel data being produced by the satellite instrument. The data/information to be displayed is unusual in type and novelty. It concerns the task of displaying multi-parameter quantities (radiation flux, directional distribution) at a given bin (Earth location, spatial GPS coordinates). It is valuable the rigorous mathematical procedures undertaken by the student in the thesis to solve the tasks. It is also valuable the research on the SW tools available for the graphical results produced and the suitability of the selected SW.

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 tasks were fulfilled. The main contribution is developing the methodology to produce the output (graphical maps). Next step (natural continuation of the thesis) is the systematic use of the developed methodology in extensive data sets - part of the scientific/physics analysis of the data. The work done and thesis results achieved will thus be extensively used.

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:
There are no objections to the results and contribution of the thesis. Only minor remarks to the thesis document - in the form of completion of comments of information displayed - e.g. for few plots, and captions of figures. The thesis document is rich and rather extensive with detailed introduction and detailed descriptions of the main parts. No unnecessary parts are remarked.

Evaluation criterion:	The evaluation scale: 0 to 100 points (grade A to F).
4. Factual and logical level of the thesis	95 (A)

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 thesis is correct in conceptual and subject terms. The thesis and the work done by the student followed the logical time-sequence solution of steps. The thesis document is well written, coherent and forms one whole piece.

Evaluation criterion:	The evaluation scale: 0 to 100 points (grade A to F).
5. Formal level of the thesis	95 (A)

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 formalisms are correct. The English is at high and satisfactory level. Very few typhos.

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 reference list is rather complete. Few additional publications which could still have been added namely for the application (science/physics) side.

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
7. Evaluation of results, publication outputs and awards	*95 (A)*

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 work and results are rather unique and highly innovative (in line with the novelty of the scientific instrument involved). Just very few applications (also high-tech scientific instruments) in other/related scientific fields possess close/similar features. The thesis and work done merit and should be part of a scientific publication at international peer-reviewed journal in the topic of the application subject (experimental nuclear physics, space radiation). SW which was used by the student is freely accessible with no use or license restrictions.

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 results will be and are already being used in practice (by the supervisor and his team - in the evaluation of extensive data being continuously produced by the instrument).

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 student demonstrated high activity, initiative and independence. We held many consultations via personal meetings mostly at the supervisor laboratory venue as well as steady communication by email and phone.

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
10. The overall evaluation	*95 (A)*

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:
The main body of the thesis, in particular the rigorous mathematical methodology, the part with results and also the extensive introductory part of the satellite navigation formalisms.

Signature of the supervisor: