

Supervisor's statement of a final thesis

Czech Technical University in Prague

Faculty of Information Technology

Student: Jakub Tkáč
Supervisor: RNDr. Jiří Kroc, Ph.D.
Thesis title: Návrh a implementace buněčného automatu simulujícího dynamickou rekrytalizaci
Branch of the study: Software Engineering

Date: 23. 5. 2017

<p><i>Evaluation criterion:</i></p> <p>1. Difficulty and other comments on the assignment</p> <p><i>Criteria description:</i> 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.)</p> <p><i>Comments:</i> The greatest difficulties with the thesis theme arrived from the following facts: it is a research software from the field of solid state physic and hence it requires the knowledge of physics, it requires knowledge of complex systems and specifically of the cellular automata theory, and it was porting a code from non-supported software Cellular/Cellang. That is an extremely challenging task for a bachelor thesis, which has to be finished within a few months.</p>	<p><i>The evaluation scale: 1 to 5.</i></p> <p>1 = extremely challenging assignment, 2 = rather difficult assignment, 3 = assignment of average difficulty, 4 = easier, but still sufficient assignment, 5 = insufficient assignment</p>
<p><i>Evaluation criterion:</i></p> <p>2. Fulfilment of the assignment</p> <p><i>Criteria description:</i> 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.</p> <p><i>Comments:</i> The student achieved all goals withing his work and he did even more that was necessary to accomplish. He worked literally day and night without having enough rest in order to bring the project to as mature state as possible. The student, with my help, achieved a deep knowledge in the field of massive parallel programming within cellular automata.</p>	<p><i>The evaluation scale: 1 to 4.</i></p> <p>1 = assignment fulfilled, 2 = assignment fulfilled with minor objections, 3 = assignment fulfilled with major objections, 4 = assignment not fulfilled</p>
<p><i>Evaluation criterion:</i></p> <p>3. Size of the main written part</p> <p><i>Criteria description:</i> 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.</p> <p><i>Comments:</i> The text covers all necessary information that is important for a good understanding of the subject. Additionally, he made user's and programmer's manuals in English.</p>	<p><i>The evaluation scale: 1 to 4.</i></p> <p>1 = meets the criteria, 2 = meets the criteria with minor objections, 3 = meets the criteria with major objections, 4 = does not meet the criteria</p>
<p><i>Evaluation criterion:</i></p> <p>4. Factual and logical level of the thesis</p> <p><i>Criteria description:</i> 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.</p> <p><i>Comments:</i> When we take into account that this is the bachelor thesis, the logical structure and information content is more than satisfactory for it.</p>	<p><i>The evaluation scale: 0 to 100 points (grade A to F).</i></p> <p>100 (A)</p>
<p><i>Evaluation criterion:</i></p> <p>5. Formal level of the thesis</p> <p><i>Criteria description:</i> Assess the correctness of formalisms used in the thesis, the typographical and linguistic aspects, see Dean's Directive No. 14/2015, Article 3.</p> <p><i>Comments:</i> Formally is thesis very well organized and written.</p>	<p><i>The evaluation scale: 0 to 100 points (grade A to F).</i></p> <p>100 (A)</p>
<p><i>Evaluation criterion:</i></p> <p>6. Bibliography</p>	<p><i>The evaluation scale: 0 to 100 points (grade A to F).</i></p> <p>100 (A)</p>

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:

Citations are more than sufficient if we take into account the fact that most of the papers are from physics what is not for sure the subject of students specialization. He searched for literature himself. The student confirmed his ability to orient even in the areas of mathematics and physics that he never heard of before.

Evaluation criterion:

The evaluation scale: 0 to 100 points (grade A to F).

7. Evaluation of results, publication outputs and awards

100 (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 is having a much higher level than is necessary for a bachelor thesis. A publicly available software has been written, which is available in ResearchGate and SourceForge portals! It is already downloaded by other researchers (and appreciated by some) who would like to do their own research in complex systems but do not actually know how:

https://www.researchgate.net/publication/316989956_Cellular_Automaton_Simulation_of_Dynamic_Recrystallization_Introduction_into_Self-Organization_and_Emergence

I do recommend to give JT an award for extraordinary effort and outputs in promoting complex systems and cellular automata. His work is very important for the community of researchers who are just about to start to program their own complex systems software and thanks to the software they know how.

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:

Many can benefit from this software in coming years. The original software was programmed about 19 years ago and interest about it is still increasing. It can help to change the field of solid state physics but not only this field. We both believe that the high level of the software helps many to pursue their own research in biology, medicine and other fields as well.

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:

For a bachelor thesis, the independence of the student was very high. We met many areas that he saw for the very first time but all problems were quickly settled down. What I do like about JT the most is his never ending willingness to resolve all problems that he met during work on this project.

Evaluation criterion:

The evaluation scale: 0 to 100 points (grade A to F).

10. The overall evaluation

100 (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:

JT did a great programming work in the field where he is not a specialist. He oriented quickly in a fuzzy and complicated 'terrains' efficiently. I do recommend JT for further work on similar projects. He found himself that he has greater abilities that they can be continuously improved.

Signature of the supervisor: