FACULTY OF INFORMATION TECHNOLOGY CTU IN PRAGUE

Supervisor's statement of a final thesis

Student:	Tomáš Bohuslav
Supervisor:	RNDr. Michal Čertický, Ph.D.
Thesis title:	Opponent Modelling Library for StarCraft AI
Branch of the study:	Web and Software Engineering

Date: 13. 6. 2018

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 thesis presents an unusually difficult assignment for Bc.-level student. It requires considerable knowledge of software engineering, as well as some basics in machine learning.

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 assignment was fulfilled without any objections. The student delivered a functional piece of software and released it publically on Github. I believe it will indeed be useful for the community of RTS AI developers.

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:
The student used most of his time to implement the software and seems to have left little time to write the text itself. As a result, the thesis is quite brief. It does contain all the crucial information, but several parts could have been more extensive.

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
4. Factual and logical level of the thesis	*50 (E)*

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:
There are some factual errors in the "Evaluation" chapter of the thesis, resulting from the time deficit. However, the student managed to mitigate those and publish the corrected version of the text publicly online (even though it was after the deadline).

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
5. Formal level of the thesis	*90 (A)*

Criteria description:
Assess the correctness of formalisms used in the thesis, the typographical and linguistic aspect s, see Dean's Directive No. 26/2017, Article 3.

Comments:
Formally, I have no considerable objections. The structure makes sense and the language used is good for a Bc. student.

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 bibliography is sufficient and the student demonstrated an ability to acquire and review the literature with no need for supervision.

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:
It's important to emphasize once again that the implemented open-source software has a good potential to be used by the game AI community. This alone makes the result valuable. From the research perspective, the student managed to 1) understand and implement a state-of-the-art solution presented in the literature, and 2) design and implement his own algorithmic solution. We are planning to write a research paper based on the thesis and publish it in the future.

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 applicability of the results is undeniable (as I explained in the previous paragraph).

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 an ability to solve complex problems independently. He was able to find and study the literature in order to understand state of the art, come up with his own solutions, suggest improvements, and implement usable software. He had no need for external motivation. My supervision was basically only needed to formulate the goals and to make sure he doesn't come up with too many new ones (which is related to my only considerable criticism - less than great time management).

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:
I recommend assigning the student a grade B for his work. The only weak part was the brief thesis text with a few factual errors, which were corrected after the thesis deadline. I personally consider the strong parts (ability to independently solve complex problems, to use machine learning methods and to write good software) to be more important.

Signature of the supervisor: