Supervisor's statement of a final thesis

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

Student:	Bc. Martin Dzurenko
Supervisor:	doc. Ing. Daniel Sýkora, Ph.D.
Thesis title:	Example-based Stylization of 3D Renderings on the GPU
Branch of the study:	Web and Software Engineering

Date: 30. 1. 2017

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 deals with the problem of artistic style transfer to renderings of 3D models. It is a part of research project StyLit and builds upon existing implementation. A key novelty of the thesis lies in the formulation of a new solution to the style transfer problem. Namely, it modifies the original energy function in a way that encourages uniform usage of source patches. This new formulation is more suitable for parallel processing and thus is better portable on the GPU. This advantage is however balanced by an additional parameter which needs to be tuned for a particular style to achieve comparable visual quality. Student performed various experiments where he compared visual quality of the synthesis based on the original StyLit algorithm and its GPU variant based on the new energy formulation. Those tests confirmed significant speed-up with relatively small quality degradation. Furthermore, student developed and implemented additional algorithmic improvements which lead to further speed-up while preserving comparable visual quality.

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, and student also came up with some additional improvements which were not originally requested.

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 size of the thesis is adequate. I appreciate the detailed description of algorithms and various results which nicely confirm achieved improvements.

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
4. Factual and logical level of the thesis	*90 (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:
There are no specific factual errors in the thesis, although some parts can be harder to understand for a novice reader (Sections 2 & 3).

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. 14/2015, Article 3.

Comments:
All used formalisms in the text are correct. Typographical and linguistic quality is good although there are some small glitches namely in the Czech abstract.

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:
Student nicely analyzed existing literature and denoted main differences in comparison to already published techniques. Citations are presented correctly. There is only a slight disproportion between the amount of information given, e.g., some publications have ISBN, DOI, and URL and others not. I would personally omit this additional information to make it consistent.

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:
Results of the thesis are of excellent quality and were very helpful for the development of the project StyLit. The thesis contains new findings that have publication potential.

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 have direct application in speeding up style transfer, namely for the live interactive session where the artist paints the style image, and the result is immediately computed on the fly in the background.

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 was active and always well prepared for consultations. Some parts of the thesis required more iterations, however, in the end, the student was able to incorporate all comments and suggestions.

Evaluation criterion:	*The evaluation scale: 0 to 100 points (grade A to F).*
10. The overall evaluation	*90 (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 thesis is of a high quality. It presents new results that have publication potential. There some small issues, however, in overall the thesis satisfied the original requirements and even provided some additional findings.

Signature of the supervisor: