THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Path tracing using Vulkan API**
Author's name:	**Matvii Bunin**
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Computer Graphics and Interaction
Thesis reviewer:	Ing. Martin Káčerik
Reviewer's department:	Department of Computer Graphics and Interaction

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	**challenging**
How demanding was the assigned project?	
Implementation of path tracing in Vulkan (which itself is non-trivial to use) requires understanding of light transport theory.	

Fulfilment of assignment	**fulfilled**
How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.	
All specified requirements are met.	

Methodology	**correct**
Comment on the correctness of the approach and/or the solution methods.	

Technical level	**A - excellent.**
Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?	
Thesis is well written, topics covered seem to be well understood.	

Formal and language level, scope of thesis	**A - excellent.**
Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?	
Formal and language level is very good, with little to none errors or typos. Thesis is logically organized and quite extensive, occasionally delving unnecessarily too deep on advanced topics.	

Selection of sources, citation correctness	**B - very good.**
Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?	
Chosen literature is adequate and citation style meets the standard, however in text references are quite sparse.	

Additional commentary and evaluation (optional)
Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

This thesis provides introduction to light transport theory as well as introduction to Vulkan API basics. Described knowledge is then implemented in form of 3D rendering application, which allows rendering multiple demo scenes using GPU accelerated path tracing in interactive fashion. Performance is measured and evaluated.

Occasionally, misleading statement is presented (e.g., polarization being never considered in computer graphics, bidirectional ray/path tracing). Due to sparse literature referencing, it is unclear where they came from.

Even though some minor imperfections are present, topic of the thesis is quite challenging and well handled.
The grade that I award for the thesis is **A - excellent.**

Questions:

1. Bidirectional path tracing algorithm description in thesis describes similar, but different algorithm. How does bidirectional path tracing (on a high level) really work?
2. In application runtime, during camera movement, I experienced noticeable tearing/shaking. What do you think causes this and what might be possible solution?

Date: **25.8.2021**   Signature: