

I. IDENTIFICATION DATA

Thesis title:	Distributed training of neural networks
Author's name:	Bc. Petr Tománek
Type of thesis :	Diploma thesis
Faculty/Institute:	Faculty of Electrical engineering
Department:	Department of computer science
Thesis reviewer:	Tomas Pevny
Reviewer's department:	Department of computer science

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	Choose an item. A
<i>How demanding was the assigned project?</i>	
The goal of the project was to understand state of the art methods for distributed modifications of gradient descent algorithm and implement it in Julia programming language, such that the implementation would be compatible with the existing libraries for automatic differentiation. The project was non-trivial, because it was spanning mathematics and software engineering / programming. Therefore the student had to understand the algorithms, implement them well, such that the implementation would be performant, and compare them while solving reasonably interesting problem.	

Fulfilment of assignment	Choose an item. A
<i>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.</i>	
The assignment was fulfilled.	

Activity and independence when creating final thesis	Choose an item. A
<i>Assess whether the student had a positive approach, whether the time limits were met, whether the conception was regularly consulted and whether the student was well prepared for the consultations. Assess the student's ability to work independently.</i>	
The student was sufficiently independent. He was interested in the topic, he was coming prepared to the consultations.	

Technical level	Choose an item. B
<i>Is the thesis technically sound? How well did the student employ expertise in his/her field of study? Does the student explain clearly what he/she has done?</i>	
The student understood the problem at the level that allowed him to implement and debug the algorithms, which was goal of the thesis, but the explanation of algorithms lacks technical details.	

Formal level and language level, scope of thesis	Choose an item. A
<i>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?</i>	
The formal level is adequate. I would appreciate more mathematical description of the solved problems and implemented algorithms, and a bit higher	

Selection of sources, citation correctness	Choose an item.A
<i>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?</i>	
The selection of sources is very adequate.	

Additional commentary and evaluation (optional)
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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.

See below

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

Considering the specialization of the student, the assignment of the student was very difficult. He had to understand the vanilla gradient descent algorithm, difficulties related to its parallelization, the state of the art methods proposed to solve the parallelization, to implement them, and compare them on real problems. I would also like to remind the audience that optimization algorithms are notoriously difficult to debug, as small constants can have a huge impact. Advisor's main interest and emphasis of the work was to investigate the impact of the biased gradient in lock-free algorithms on the speed of convergence measured by the number of iterations. In this sense, the thesis was fulfilled, although I would welcome more thorough experimental evaluation and better technical description of the thesis. With respect to the above and the enthusiasm with which the student was solving the problem,

I award for the thesis is **B**.

Date: **3.9.2021**

Signature:

