THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Efficient Algorithms for Relational Marginal Polytope Construction**
Author's name:	**Kozák Jan**
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Computer Science
Thesis reviewer:	Yuyi Wang
Reviewer's department:	D-ITET, ETH Zurich

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	**ordinarily challenging**

How demanding was the assigned project?

The algorithm in the AISTATS paper is indeed trivial, so there should be a large space to imporve.

Fulfilment of assignment	**fulfilled with minor objections**

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.

Although no rigorous guarantee, the experiments show that the ILP-based method is efficient.

Methodology	**correct**

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

ILP is a possible way, and the ILP formulation looks correct. However, it seems one can remove $|.|$ from (4.12) because of (4.11).

Technical level	**C - good.**

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?

No rigorous guarantee, but the proposed method has been verified experimentally.

Formal and language level, scope of thesis	**C - good.**

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?

The thesis is not difficult to read.
"FO d-DNNF" seems not correct.
"the AISTATS algorithm" should have a better name.
Caption of Fig 4.2

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?

The thesis refers to earlier works, in a proper way, when necessary.

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.

Please insert your comments here.

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.

The grade that I award for the thesis is **C - good.**

ILP-based method indeed improves the efficiency, even though no guaranteed approximation algorithm has been found.

The questions:

1. Why ILP-solver? There are other (NP-complete) solvers, e.g., SAT-solver.

2. What's the usage of the constructed RMP?

3. What if the domain size is much larger?

4. Can we train a model to compute the marginal polytope?

5. What's a better representation of polytopes in this task? Inequalities or vertices?

6. Do you have any idea to tackle the "optional" task?

Date: **18.6.2021**   Signature: