THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Efficient MDP Algorithms in POMDPs.jl**
Author's name:	**Omasta, Tomáš**
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Cybernetics
Thesis reviewer:	Niklas Heim
Reviewer's department:	Artificial Intelligence Center, FEE

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment
<div style="text-align:right">

challenging

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How demanding was the assigned project?

Understanding and implementing Finite Horizon POMDP solvers is a challenging task. It involves understanding the non-trivial formalism of (PO)MDPs as well as correctly translating this mathematical framework into correct code.

Fulfilment of assignment
<div style="text-align:right">

fulfilled

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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.

The thesis adequately surveys existing MDP/POMDP solution methods before implementing a finite horizon wrapper for infinite horizon POMDPs and corresponding solvers. The wrapper and solvers are openly available as Julia packages through Julia's package registry. The work therefore represents a contribution to the field of MDPs that is directly and easily accessible for the whole community.

Methodology
<div style="text-align:right">

correct

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

The implemented methods seem correct as demonstrated in the experimental section which applies the solvers to well-known POMDP benchmark problems.

Technical level
<div style="text-align:right">

B - very good.

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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?

The student has proven to be able to successfully navigate a larger body of scientific methods. Existing work is correctly and understandably summarized. Only some theoretical concepts would have deserved concrete examples to make them easier to grasp. The implementation is well explained and demonstrated in the experimental section.

Formal and language level, scope of thesis
<div style="text-align:right">

B - very good.

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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 consistently organized, well-written, and understandable. The (PO)MDP formalism is described with consitent notation. The language is clear. It just slightly suffers from the lack of concrete examples.

Selection of sources, citation correctness
<div style="text-align:right">

A - excellent.

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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?

Prior work is adequately cited and the student's work is clearly separated from existing methods via the individual

packages that were implemented.

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.
The thesis in general represents a very well-executed scientific work. The implemented solvers have already been known but their implementation in the growing ecosystem of the Julia language is a very valuable contribution not only to the scientific community.

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 A - excellent.

Date: **31.5.2021**   Signature: