

I. IDENTIFICATION DATA

Thesis title:	A heuristic algorithm for Phantom Go
Author's name:	Petr Syrovátka
Type of thesis :	<input type="text"/>
Faculty/Institute:	<input type="text"/>
Department:	Katedra počítačů, AIC
Thesis reviewer:	Ing. Michal Sustr
Reviewer's department:	Katedra počítačů, AIC

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	<input type="text"/>
<i>How demanding was the assigned project?</i>	
The thesis was challenging and consisted mostly of practical implementations . It was not focused much on theory. Student had to implement the game of Phantom Go, sampling histories from an information set and use the sampling in Information-Set MCTS algorithm with a custom heuristic evaluation function, like an existing Go engine.	

Fulfilment of assignment	<input type="text"/>
<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>	
Student used IS-MCTS variant with random rollouts (baseline) to play against Go engine evaluations of the leaves in the search tree. He did not exactly replicate previous state-of-the-art. The previous work mostly consists of heuristic tweaks of the baseline. As the baseline already performed better than the new Go-engine approach, we can expect the new approach would be even worse against the state-of-the-art. Therefore I regard the omission of exact replication as only a minor objection of assignment fulfillment.	

Activity and independence when creating final thesis	<input type="text"/>
<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>	
Student had a positive approach, we regularly consulted the work and he prepared for the consultations. He did most of the implementation work independently, however he seemed to not learn efficiently from his past implementation mistakes and required pointing them out repeatedly. He did most of the writing close to the deadline, rather than throughout semester, which resulted in rushed writing of the thesis. Therefore I decided to give a lower score (C).	

Technical level	<input type="text"/>
<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 thesis is technically sound and well motivated. The student employed his expertise in artificial intelligence and implemented algorithms to play the challenging imperfect-information game. He explained what he has done. However, he did not report statistical significance of the results (despite requesting this), which is why I give a lower score (B).	

Formal level and language level, scope of thesis	<input type="text"/>
<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 thesis does not have a good "flow" and the text could use a couple more writing iterations to present the main ideas more cleanly. However, as the student did most of the writing close to the deadline, there wasn't much time to help him	

how to improve the text. The thesis is organized in a logical way. There is enough of details, but a reader who is not familiar with imperfect-information games might find it difficult to understand the text. English is satisfactory, but could be improved. For these reasons, I give score (C).

Selection of sources, citation correctness

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?

Student references prior work on heuristic algorithms for Phantom Go and algorithms with theoretical guarantees, which is adequate. Original work is clearly distinguished from earlier work. Some citations do not show publication venue (journal/conferences) nor other bibliographic identifiers. Therefore I give score (B).

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 shows that using Phantom Go engine for leaf evaluation did not make the algorithm stronger than baseline random rollouts when playing a game online with a limited time budget. However, it is not clear whether this result indeed holds also for other Go engines. Further work is needed to establish this empirical observation.

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.

The student showed his ability to work on challenging AI problems when provided with guidance. I believe with a more consistent effort and better time-management he would make an excellent thesis. Based on what he has done, the grade I award for the thesis is

Questions: Have you tried playing against your best algorithm, while you had either perfect or imperfect-information? Can you comment on how it plays some game?

Date: 30.5.2022

Signature: Sustr