Searching by learning: Exploring artificial general intelligence on small board games by deep reinforcement learning
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Citation

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**Title:** Searching by learning: Exploring artificial general intelligence on small board games by deep reinforcement learning
**Issue Date:** 2021-09-07
Stellingen
doorg Hui Wang, auteur van

Searching by Learning: Exploring Artificial General
Intelligence on Small Board Games by Deep
Reinforcement Learning

1. Classical Q-learning converges in General Game Playing slowly, and a
   simple Monte Carlo Search improves the speed. [This thesis. Chapter 2.]

2. The interaction impact between hyper-parameters suggests the need for
   balancing searching and learning in AlphaZero. [This thesis. Chapter 3.]

3. Summation of policy loss and value loss is not always the best loss function;
   it can serve as a default compromise choice. [This thesis. Chapter 4.]

4. Monte Carlo Tree Search enhancements can improve the start phase of Al-
   phaZero. Properly determining the length of the start phase of using such
   enhancements can further improve the training. [This thesis. Chapter 5
   & 6.]

5. AlphaZero-like self-play can be used to master complex single player com-
   binatorial optimization game with a ranked reward mechanism which re-
   shapes game outcome as win or loss. [This thesis. Chapter 7]

6. In deep reinforcement learning, searching and learning are usually com-
   bined to master different complex tasks, but it is hard to say which one is
   more important.

7. Self-play training heavily depends on the self-play examples, which sug-
   gests the importance of generating high quality training data, which can
   be provided by expert players.

8. We are still far away from achieving Artificial General Intelligence, al-
   though deep reinforcement learning has shown impressive ability of mas-
   tering a part of specific complex problems.

9. Just do it and never give up.

10. Life is like a game, everyone is a player. You can not change the game rules,
    but you can determine the objective you wish to achieve. It is impossible
    that every player is a winner, but it is possible that every player enjoys
    the process of playing the game.