ANALYSIS OF MACHINE LEARNING APPLIED TO BOARD GAMES

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ABSTRACT

In October 2022 DeepMind announced an artificial intelligence in a preprint [1] that was called AlphaTensor. It utilized *artificial neural networks* in combination with *heuristic algorithms* in order to solve the unsolved problem of finding faster algorithms for matrix multiplication. AlphaTensor was succesful and has shed light on the process of finding new algorithms. In this paper we aim to study the effectiveness of different *neural networks* and *heuristic algorithms* such as the one used in AlphaTensor. More precisely, we intend to analyze the efficiency of those networks and algorithms in combination with varying *optimizations, parameters, hyperparameters* and *architectures* applied to the classic games *Connect Four* and *Othello*.

Keywords — Machine Learning, Supervised Learning, Reinforcement Learning, Neural Network, Deep Learning

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I am a forest, and a night of dark trees: but he who is not afraid of my darkness, will find banks full of roses under my cypresses.

— Friedrich Nietzsche, Thus Spoke Zarathustra

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References

[1] Huang A Fawzi A, Balog M. Discovering faster matrix multiplication algorithms with reinforcement learning. *Nature*, 2022.