Permaximize

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Robots and computers are now essential tools in today's society that automate tasks in every field. Programmers utilize the concepts of machine learning (ML) and Artificial Intelligence (AI) to prepare robots to face new challenges. To improve a method called a Genetic Algorithm, a turn-based board game was written with two computer opponents to play it. One of the opponents was designed as a static AI, where the computer evaluates each move with a strategy set by the programmers. The other was designed using machine learning, where the computer evaluates each move against a strategy that it creates. The two players were pit against each other hundreds of times so that the ML opponent could refine its outcomes to the perfect strategy. The ML opponent used the score difference of each game to evaluate the strategy it used and to refine it over time. After a thousand games, the data showed a general convergence toward a single strategy. This supports the effectiveness of a genetic algorithm, but it doesn't necessarily prove that the algorithm designed the global best strategy. The ML opponent was consistently superior and lost at a similar rate across the entire experiment, meaning that the ML player might not have actually significantly improved, as was the objective. Although it may not have improved the win rate, it was still more effective than the static opponent, proving that it is possible for machine learning-programmed software to exceed the ability of hand-programmed software.

Awards Won:
Third Award of $1,000