Abstract

This thesis concerns the application of computational intelligence techniques, mainly genetic algorithms to computer games. The game of Go-Moku and Othello offer a clean well defined domain in which to investigate truly fundamental issues in computer science of board games. In the taxonomy of games, Go-Moku is a two player board game, with perfect information.

In the initial part of this thesis, I present a general family of games. This research has parallel and non-exclusive goals: to study existing board game playing techniques, to develop Go-Moku and Othello game based on genetic algorithm, to make the moves more optimized in terms of time and winning capability. Each of the goals is discussed in length. The research is also discussed in comparison with other existing optimization techniques which are applied to artificial game playing in particular.

The experiments are presented which take into consideration the various features of the game, and how exactly it can be used in the game playing. The genetic algorithm parameters are considered and the fitness evaluation function developed, which lead to the next optimized move.