ABSTRACT

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MASTERMIND SOLVER USING STOCHASTIC HILL CLIMBING ALGORITHM

(xi + 55 pages; 27 figures ; 13 tables)

This thesis discusses the development of artificial intelligence that can be implemented into a game. In this thesis, the game who is given a system of artificial intelligence is a Mastermind game. As we know, there is a lot of games that have been known which can be implemented on a computer. Implementing a game to the computer’s engine can be done with a help from the artificial intelligence systems. However, these artificial intelligence systems can help in solving a wide variety of games. It makes a challenge to complete the game using the Stochastic Hill Climbing Algorithm. The proposed system intends to simplify the guessing process.

This thesis is a research design, which is used a Stochastic Hill Climbing Algorithm and Visual Basic 6 to solve the problem. The Stochastic Hill Climbing algorithm is a Stochastic Optimization algorithm and a Local Optimization algorithm. It is a direct search technique, as it does not require derivatives of the search space. The strategy of the Stochastic Hill Climbing algorithm is iterate the process of randomly selecting a neighbor for a candidate solution and only accept it if it results in an improvement. The strategy was proposed to address the limitations of deterministic hill climbing techniques that were likely to get stuck in local optima due to their greedy acceptance of neighboring moves.

From the design of the research results can be concluded as follows: AAAA patterns produce the flatness 3.733333 after 30 times attempt. AABB patterns produce the flatness 4.066667 after 30 times attempt. AAAB patterns produce the second highest flatness, the result was 4.555567. The highest flatness produced by AABC with 4.6 flatness after 30 times attempt. And ABCD patterns produce 4.366667 after 30 times attempt.