

ABSTRACT

In every game on a computer or console, there is a Non-Player Character (NPC). The existence of NPCs aims to make the game look more alive, especially for games that focus on offline-gameplay or single-player games. There are some situations where the NPCs in the game need to be updated. For example, when a new content expansion in a racing game occurs and a new circuit is loaded into the game. To simplify the process of updating and developing NPCs, the authors developed artificial intelligence-based NPCs using the rule-based (RB) method.

Based on testing using the RB method, it was found that NPCs could run well in an environment that had been developed by the author. By testing on 2 types of environments that have been developed, in arena 1 the results are obtained where NPCs from 10 matches with 6 players can win 50% of matches with a reward parameter of 3.5, then in the test in arena 2 the results were obtained where the NPC got a winning percentage of 23.3% from 5 matches. Whereas in performance testing without the application of the RB method to NPCs in arena 1, the results obtained where NPCs from 10 matches won 26.67% of matches against players and in arena 2 it was found that NPCs had difficulty competing against players which made them have 0% wins from a total of 5 matches. The results of these tests indicate that the application of the RB method makes the game more balanced between players and NPCs. The shape and condition of the environment along with its parameters can also affect the performance of the NPC

Keywords: *Artificial Intelligence, Rule-based, NPC, Game Development.*