Comparative Study on the Efficiency of the Stochastic and Wall Follower Methods of Solving Mazes in Three Dimensions

Rivera Crespo, Gian Carlo

Diaz Morales, Axel Gabriel

This project has the purpose of finding the amount of average steps that will solve a 3D labyrinth, with multiple floors, using the stochastic method (random process). The initial idea was to prove that the stochastic method was efficient. We first compared how efficient the stochastic method was in relation to other maze solving techniques, in this case the wall follower. There was success in proving that the stochastic method was actually better and more efficient for solving a three dimensional maze than the wall follower method, after these results we proceeded to calculate the efficiency of this method. The efficiency was determined by subtracting the number of steps it takes to solve the tridimensional maze with the stochastic method, from the numbers of steps it takes with the shortest way possible and then dividing it by the number of steps it took with the stochastic method, multiply by 100 and then the result was subtracted from 100 to obtain the percent of efficiency of the method. The number of steps was calculated by assigning numbers to each direction and then proceeding to solve the maze using the corresponding method. After repeating the experiments with the tridimensional mazes the results indicated that although the stochastic method was better than the wall follower when it comes to efficiency it’s not very efficient. Stochastic optimization can be applied to any process that can be done, therefore studying its efficiency and how well it works can be applied to it. It can be of great contribution of areas like computer programing and game design. Also we can design computer software that calculates the number of steps it takes to solve a tridimensional maze depending on the method used automatically and with more interconnections with each level.

Awards Won: