The problems of route planning for the movement of robots, has been an important research topic over the past 3 decades. Different studies have been developed which implement increasingly efficient methods that can solve this problem. This purpose has been treated by giving two approaches: the first was focused on trying to solve problems of motion planning using previously recognized global environment, limiting in any respect the information and characteristics of the robot. The second approach focuses on developing a robotic motion planning using local sensor information and considering the characteristics of the robot substantially.

In a project conducted by researchers at the Universidad Carlos III de Madrid Spain, conducted a study of route planning for the movement of robots using two methods, such as the Voronoi diagram and the fast marching method. The last-mentioned method has been applied to route planning, but it is an unreliable method, since the paths made handle a minimum distance and the routes are too close to obstacles. To improve the security of the trajectories calculated by the fast marching method, using a technique in which the main objective is to avoid wrong paths that occur when areas are narrower than the size of the robot, thus the obstacles with far less than half the size of the robot need to be removed by implementing the method of Voronoi diagrams. Another technique implemented is to delay barriers and walls at a safe distance to ensure that the robot will never collide. The last step is to calculate the trajectory in the image generated by the Voronoi diagram using fast marching method, and then check the path obtained considerations required for smooth and secure route planning of robot motion. In the Voronoi diagram skeletonization algorithm is implicit which is described as a discrete sequence of points that can be approximated boundary from the points of Voronoi diagrams. As mentioned in an article from the Polytechnic University of Catalonia “Coprocessor for Fingerprint” skeletonization seeks to represent an binarized image by a thin thickness graph whose points satisfy the local distance from the edges of the binarized image is max. Skeletonization algorithms are based on the execution of a set of iterations, where each one is done erasing the pixels belonging to the edges of the image until only the skeleton. Erasing or not each pixel requires a local analysis of the neighboring pixels to determine if it belongs to the edge of the image and if the deletion allows connectivity with the rest of the skeleton.

In a thesis done by students at the National Polytechnic School in Quito Ecuador “Design and construction of a mobile robot that can navigate through a maze” will implement a series of algorithms, among which one can mention the random algorithm, in which the robot is responsible for carrying random exploration, this search does not have any intelligence to move the robot, one is to move to one side until the distance is reached or until the robot collide an obstacle. Another algorithm that is described is the recursive traversal algorithm, which is based on the path of a return path, which gives an error message when it encounters an obstacle and a success when it finds a way out. In any case, it is tried to run recursively traverse any of the 4 possible directions. This method will always find a way out, but in most cases it will not always be the shortest path,

unable to rule out which is correct. Tarry's algorithm creates a cyclic path in the maze, passing through each cross only once in each direction, thus taking an initial position, it selects a road and marks in a special way when it reaches the next intersection, it is marked according whether or not it has been explored. The algorithm ends its journey in the place to start visiting ensuring every intersection at least once in each direction. Finally, I mention the algorithm of the right hand and left hand which is to continue the wall of the maze either left or right and is effective in all cases is known or unknown the maze, such an algorithm does not solve mazes that are not interconnected, unless you begin the tour of the exterior walls of the maze. A disadvantage of this algorithm is that the path is wasteful because it has to go through all the options to find the exit.

MSc. Mr. Cesar Augusto Suarez Hernandez
Director and Editor of the Tecnura Journal
Technology Faculty
Francisco José de Caldas District University