Abstract

A key issue in mobile robot applications involves building a map of the environment that may be used by the robot for path planning. In this paper, a new approach for uneven environment reconstruction based on the information supplied by a millimetre wave (MMW) radar has been proposed. The returned raw data from the MMW are stored in a database and then transferred to the CAD model, and represented as objects using an algorithm. The non-uniform rational B-splines have been used to extract the polygonal mesh decomposition equivalent to the 3D uneven environment and obstacle surfaces. The polygonal mesh decomposition helps to locate the different obstacles and to build the optimal path to reach the target starting from any initial position, by taking into consideration the terrain traversability. The optimal path is obtained by applying distance calculation method and speed limits. Indeed, the returned path is smooth which is a crucial performance consideration, especially for practical service robots