Abstract:
This work consists of a method enabling an autonomous mobile robot to follow a generated path in 3D. Initially, this work deals with the problem of mobile robot displacements to generate trajectories in 3D environment with obstacles avoidance. To simplify the modeling of the environment, we use the Principal Component Analysis (PCA) method to present the 3D objects in planar environment. Furthermore, we describe in a formal way the obstacles avoidance algorithms structure basing on parametric curves technique. Then, we will interest to the smoothing problem of the generated path, for this purpose we use Non Uniform Bi-splines (NURBs) curves. At the end we can, by means of an adequate sensor (radar sensor), implement the control strategies on an embarked PC chart, then send them into the robot controller in order to follow the trajectories instruction. AutoCAD software is used for simulation, and Visual basic is used to code the algorithm and to extract the parameters of the generated trajectory to be followed.