

In this paper we discuss the ability to deal with a fuzzy logic navigation approach for intelligent autonomous mobile robots in unknown environments. The aim of this work is to develop hybrid intelligent system combining Fuzzy Logic (FL) and Expert System (ES). This combination provides the robot the possibility to move from the initial position to the final position (target) without collisions. This combination is necessary to bring the machine behaviour near the human one in reasoning, decision-making and action. That was the current reason to replace the classical approaches related to navigation problems by the current approaches based on the fuzzy logic and expert system. The robot moves within the environment by sensing and avoiding the obstacles coming across its way towards the unknown target. The focus is on the ability to move and on being self-sufficient to evolve in an unknown environment. The proposed hybrid navigation strategy is designed in a grid-map form of an unknown environment with static unknown obstacles. This approach must make the robot able to achieve these tasks: to avoid obstacles, and to make one's way toward its target by ES\_FL system capturing the behavior of a human expert. The integration of ES and FL has proven to be a way to develop useful real-world applications, and hybrid systems involving robust adaptive control. The proposed approach has the advantage of being generic and can be changed at the user demand. The results are satisfactory to see the great number of environments treated. The results are satisfactory and promising