

Abstract:

Robot can serve human society in many way. Home security surveillance is the one of most important applications that robots can easily do for us when we are not home. In this case, there are two issues we have to consider. First, the robot must be able to move freely and patrol the area autonomously. Second, it must be able to detect the ambient anomaly and blow the whistle to alert its owner or operator who may be in a distant site. This requires a proper navigation algorithm that can integrate the motion control and sensing capability so that the robot can estimate the surrounding environment and avoid bumping into any obstacle while moving around, as well as collecting and processing the information about its ambient environment. This scenario is a typical example for anyone to learn how mobile robots work. Our project is named Max because we expect the robot to do exactly what a military dog does --- patrol and search for anomaly situation. In this project, we just implement one simple task for Max to do --- alert us if we forgot to turn off our house light while we are out. To serve as educational project, students will learn how to build robot using LEGO kits, and how to develop algorithm in terms of NXT-G program for the LEGO robots. This project shall motivate those who desire to pursue the study in the field of robotics and mechatronics.