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Improvement of Different Tasks of Microcontroller as Line Path Follower

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Abstract : *robotics is one of the branches of artificial intelligence that act consistently. Case of a mobile robot which is assigned a specific task, we must be able to give him the means to learn the environment and to act according to the role for which he should be created this requires that the robot has capability to learn, sensors and it can act through actuators.The development of the order goes through several stages which include the data of a predictive model of the robot can tell us how to develop the command to perform a given task.The synthesis of the command requires programming a controller that provides the necessary signal of the actuators.The complexity of the implementation of such a system is the fact that several disciplines are mixed electronics, control, computer and mechanical engineering.*

Keywords – *actuators, line follower, sensor, microcontroller*

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I. Introduction

Robotics is generally based on the study of automated systems capable of direct interaction with their environments. There are two types of robots, stationary robots that are commonly used in industry to perform specific tasks and mobile robots are used for example to carry loads.

The wheels are the most common in mobile robotics means of locomotion. In fact, mobile wheeled robots are easy to make and are great opportunities to travel and maneuverability with a large speed and acceleration obviously for a given set of wheels any provision does not lead to a viable solution. A wrong choice can of the robot or cause potential blockages. there are several classes of wheeled robots that are determined mainly by the position and number of wheels used: robot unicycle, tricycle robot, robot car, omnidirectional robot

II. Pedagogic Approach

The multidisciplinary aspect is an important pedagogical element:

- Follow regulations and precise specifications
- Match optimally mechanical and electronic components
- Discover the principles of programming and control the strategy of the movement for greater efficiency.

III. Functional Analysis

The needs analysis is used to characterize the functions of services expected in a line follower robot. It is based on a set of specifications can meet the needs.

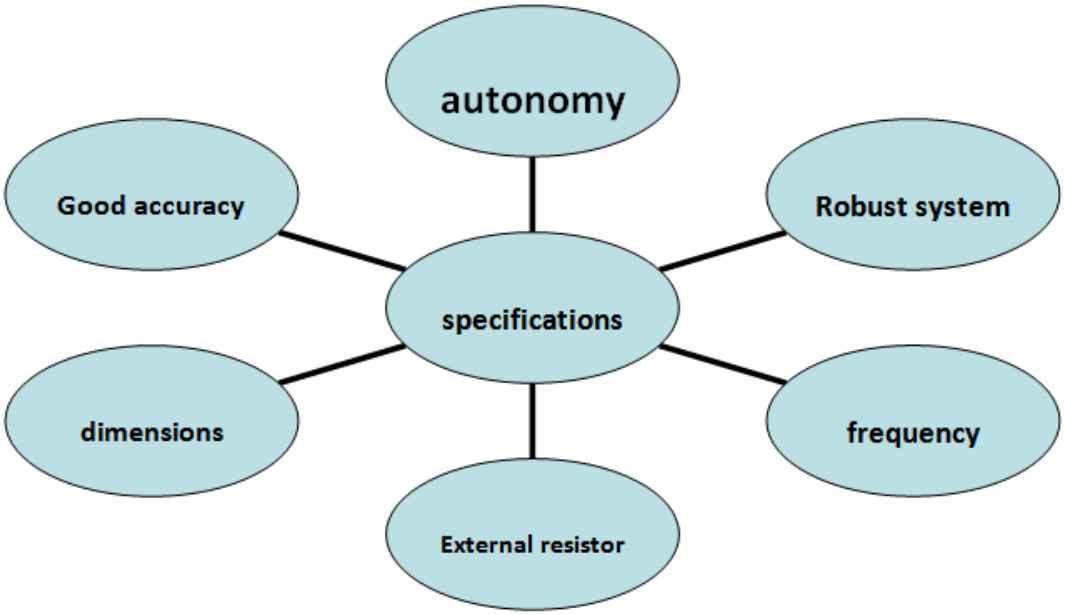

Figure 1 : elements specifications

To represent the main functions and constraints I studied ((Octopus diagram)) provided by the specification which allows a graphical representation of all that affects the follower robot.Aline connecting two elements of the environment through the product symbolizes a main function FP.A line connecting the product to an element of the environment represents a constraint function FC.

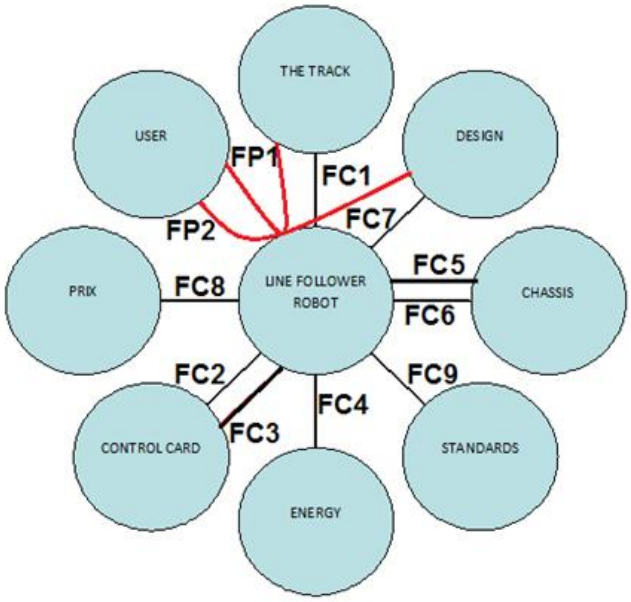

Figure2: production of an ((octopus diagram)) defining the principal functions and constraints in the environment.

From the diagram I see that the FP1 and FP2 functions have a high percentage compared to other functions indeed, I must give more importance in the design of equipment to the main function not forget to consider other service functions.

IV. Principle Of Operation

Mini follower robot we propose to realize a function to follow a path drawn on the ground. More specifically, the behavior of the robot is to follow a black line on white background.Initially, the robot is placed in the middle of the black line so that the sensors detect the middle line. when turning (e.g. left) two sensors right not detecting the black line forcing the left motor to slow to put the robot in the middle of the black line [1]

The block diagram of the follower robot can be provided in the form given in the figure3.

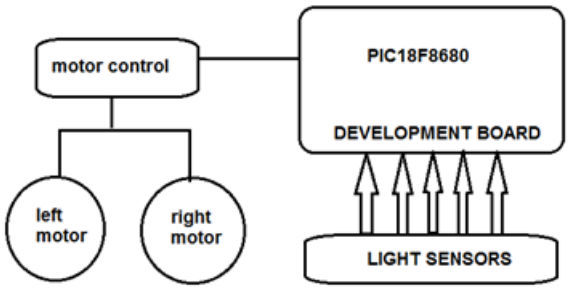

Figure 3: block diagram of the follower robot [2]

I have three possible cases: go straight, turn left or turn right. I will make the robot go as fast as possible in a straight line ,it will be necessary to supply both motors at maximum (5 volts) and when being turned one of the motor 2 will be a constant maximum and I will fix the speed of the other motor to vary the speed according to the degree of the turn.

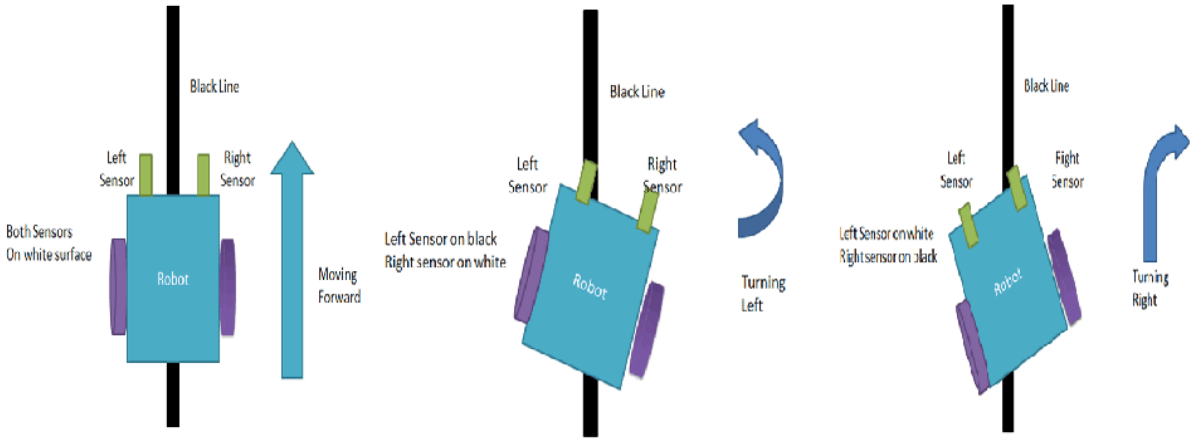

Figure 4: possible directions in office supply voltages motors

V. Technological Choice

The technical study is to characterize the application aspect of our project line follower robot, indicating the different components used such as sensors, actuators and pics etc., with the description of their technical requirements and operating diagrams, and various applications based on computerized methods available and required (software, programming language verification tests….. etc.) to achieve the realization of the final model of my line follower robot [3], [4]. My program will consist mainly of two macros:

- The first is called "right wheel" and will therefore enable us to do the right wheel.
- The second "left wheel" and used to control the left wheel

VI. Development

Saying a line follower robot, the weakness and limited task to perform. This lack of operation of the types and numbers of equipment used in the processing unit time was a microcontroller, today it is changing in name Arduino, more intelligent, vary easy on the programming mode with a dozen additional devices, it increases the number and types of sensors are opening a big robot perception.

VII. Conclusion

we did the study, design and implementation of the follower robot. After reviews of the main types of mobile robots currently exist, I introduced the functional analysis of the product to achieve. And I dedicated to the theoretical study that allowed us to see with a unicycle, it was possible to follow any path in the plane of movement allowed us to define the components that make up the robot and have the set in the PIC microcontroller model program, I presented the various stages of design and justify the choice of selected components, there is of course a lot of improvements that can be made to the draft follower mobile robot

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