

Designing NXT Robot For Position Control

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The Senior Project Entitled:

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In accordance with the recommendation of the project supervisors, and the acceptance of all examining committee members , this project has been submitted to the Department of Electrical and Computer Engineering in the College of Engineering and Technology in partial fulfillment of the requirements of Department for the degree of Bachelor of Science in Engineering.

Project Supervisor

Department Chairman

Dedication

For our family, for our parents, for our sisters and brothers, to all whom I love, to all of our loyal teacher, to all who help us to reach this level of education, and to who has made the development of this humble project, to all of my friends and my academic younger friends, to my colleges that I have learnt from them.

Acknowledgment

By the name of Allah, most gracious, most merciful
And say: “Soon will Allah observe your work, and his messenger and the believers”

All praise and glory to Allah almighty, who made this project to accomplished. We feel honored and privileged to glorify his name in the sincerest way through this small accomplishment and ask him to accept our efforts.

The project team advances the thanks and deep appreciation to whom attribute and take care of this small project, thanks to Palestine polytechnic university especially College of Engineering and Technology and its staff, whom work to graduate the generation to come and the future builders, thanks to all of our teacher in the university, special thanks to industrial automation coordinator ”Dr. Sameer khader”, thanks to the supervisor ”Dr. abed alkader alzar” whom they devoted their efforts to graduate us in the best way, thanks to library and its staff whom helped us to the books which we need for simple project, thanks to everyone who put his hand with us to accomplish this simple project.

Abstract

The main idea of this work to design and programming that executed given orders and tasks such as moving pin in curveting path, hand slope, catching bodies of plastic, for example if we want the robot to catch a blue ball the robot we programming him by the NXT program, after that the robot moves to the required point, then the light sensors detect weather the ball has the ordered color or not, if so the robot bring it, otherwise the robot return back to the point where he launched from.

Realizing predetermined task can be achieved by uploading the program code the NXT intelligence brick then it can applied automatically

In designing at first we explain about building the frame and the structure of the robot body, then we explain the usage of the gear box which they used to increase or decrease the velocity, we talk about the pulleys and their usage, their implementation, the five sensors sound sensor, touch sensor, Ultrasonic sensor, light sensor in addition to encoder embedded to the motor, each sensor has specified own function to do, each sensor situated in the position required to do the task in proper way, the NXT brick situated in the center of the robot to convenient the communications between the transducers and the actuators, the two DC-Servo motors are positioned in the bottom part of the robot to attach the motors rotor with the wheels for moving the robot while the third one “also DC-Servo” is situated in the upper part to do the task.

The result from this work states that the robot implemenent the task precisely according to the code downloaded to the Brick that’s why the usage of DC Servo motor, but We notice that somehow the encoder attached to the shaft has little error so that some errors occurs, in addition to that the gears has backlash problem while attaching, the size of the wheels has a relationship with the speed of the robot

