

NXT programming Tutorials

The tutorials progressively build on the student's understanding of the programming software, and gradually increase in difficulty.

1. In the first video tutorial, student will be introduced to all the basic commands and functions in the NXT-G graphical language of the LEGO® Mindstorms® NXT system.

NXT Tutorial 1

2. In the second tutorial, the exercise is divided into five different labs. Each lab introduces a different technology and application that will be useful in programming your final competition robot.

NXT Tutorial 2

The lab topics include:

1. Motion basics and the use of rotational encoders
2. Object avoidance using ultrasonic and touch sensors
3. Controlling a robot using only a sound sensor
4. Mimicking movement between robots using Bluetooth wireless technology
5. Line follower application using a closed loop feedback motion control algorithm

NOTE: A LEGO MINDSTORMS NXT retail kit is required for all of the labs with the exception of Lab 4 which will need at least two kits to demonstrate the exercise. The Tribot hardware design is recommended for all of the labs.

Each lab consists of three main parts:

Part A: A sensor is introduced to a student. The student will explore its functionality, and gain an understanding of its purpose and limitations.

Part B: The student will follow a script to write an example application that employs the technology. This will build their programming skills, and reinforce the purpose of the technology. Once the program is finished, it can be tested with the robot to see the end result.

Part C: A challenge is offered to give the student a chance to use their imagination. Generally the challenge objectives are an extension to the application from Part B. Guidelines and tips are provided to ensure that the student stays focused on the correct task, and completes it within a reasonable amount of time.

You must complete Tutorial 1, and if you are going to use NXT sensors and NXTcamera (by Mindsensors), you also need to complete Tutorial 2. To get the credit for Tutorial 1, you need to turn in a Memo that includes all the codes you wrote during the tutorial. For those doing both tutorial, you not only need to include the codes you wrote for Tutorial 1, you must also construct a pathfinder and program it according to the instruction in the website:

http://courses.washington.edu/engr100/Section_Wei/robotics/pathfinder.pdf

PS. For Spring 2009, you just need to do the Tutorial 1!!!!

Additional information

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1. Instruction Manual (comes with the kits)
2. Use those default programs and robot on the right in NXT program. It shows how to put robot together.
3. [Basic Gear mechanics](#)
4. <http://www.philohome.com/nxt.htm> (examples of NXT robots)
5. <http://mynxt.matthiaspaulscholz.eu/> (examples of NXT robots)
6. <http://www.teamhassenplug.org/NXT/> (tips on sensors and programming)