Teacher Notes: Ramp It Up

Introduction to Mobile Robotics > Anytime Activities > Ramp It Up

Description of the Unit

The robot won't be able to climb stairs, but it should be able to take advantage of a ramp if it can find one. In this Activity, students will explore the physical features of the robot that make it tip or be stable on a ramp. This includes a discussion of Center of Mass and support polygons.

Unit summary: students will…

- Reconfigure the robot to be stable going up a ramp
- Learn about Center of Mass and support polygon
- Investigate what it takes to make the robot stable going down the ramp

Prerequisites:

- Set up stiff board ramp for each group
- Make sure all robots have NXT in standard (angled) position
- Present to class the Ramp It Up slideshow from Teacher's Curriculum CD and have class discussion (optional)

Approximate classroom time: 1-2 class periods (45-minute periods)

Note to the teacher

This Activity can only be done with the Taskbot model.

This Activity is designated as an "Anytime Activity," and is therefore meant to be optional. It can be completed at any point over the course of the Robotics Engineering Unit.

This activity is not heavily calculation-based. It deals more with geometry, design, problem solving, communication and testing. Students will be reconfiguring their robots to lower the center of mass so that the robot is stable on a slope, and investigating what it takes to do this.

Students will be able to:

1. Explain Center of Mass
2. Explain support polygon
3. Reconfigure the robot to reposition the Center of Mass above the support polygon on different slopes
4. Discuss elements of robot design and relate elements to those of real world vehicles