EN1-06: Simple Robotics

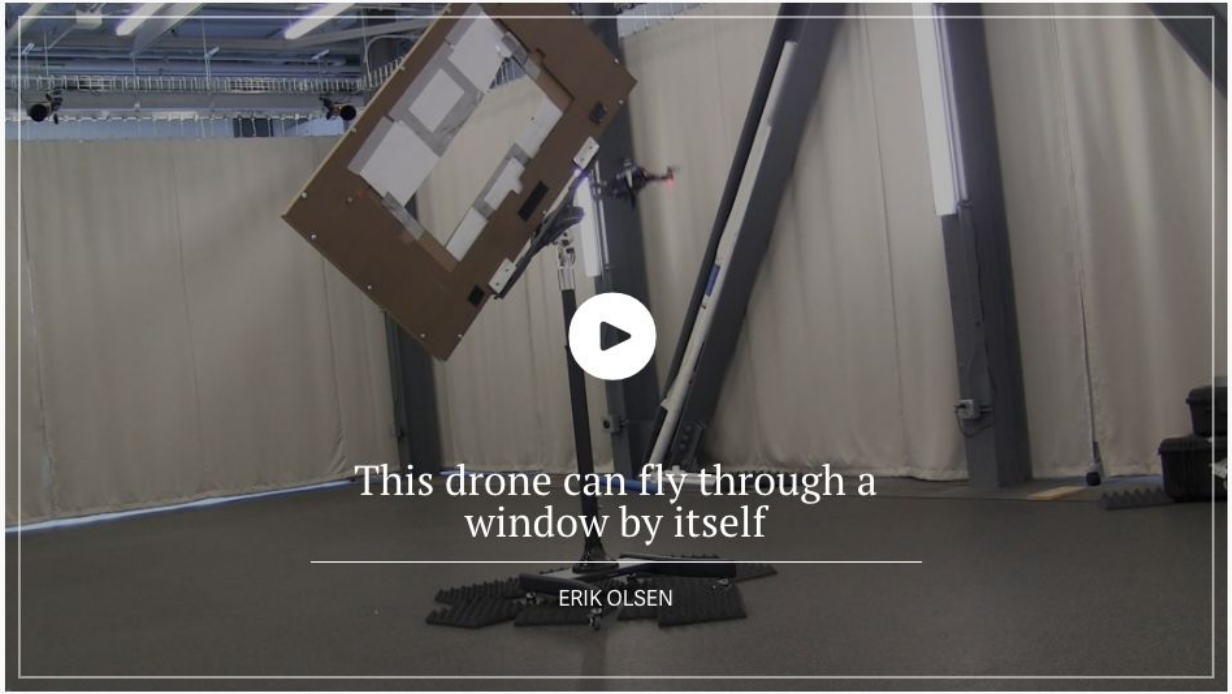
October 7th, 2016

Schedule

- In the News
- Recruiting Mechanical Help
- Assignment 4: Robotic Magic Trick
- Hands-on Activity: Sound, Clusters, and Drawing

In the News

This little drone can zip through a window on its own



http://qz.com/787937/scientists-have-built-an-autonomous-drone-that-can-figure-out-how-to-fly-through-windows-without-a-human-pilot/

Assignment 4: Robotic Magic Trick

Project 4: Robotic Magic Trick **EN1-06 Fall 2016**

Project (in-class demonstration/video presentation) due on Monday, October 17th, 2016
Documentation (description, images, videos, code, etc) due to website by Mon (10/17) by 9pm

Project Description: Create a robotic magic trick (either performed by the robot or performed by you and facilitated by the robot).

Hardware and Programming: You will use your LEGO MINDSTORMS EV3 Kit as well as any other materials needed for achieving the effect. You will program your robot in LabVIEW.

Assignment: You can work in pairs or groups of four (your choice); the complexity of the robot/project should reflect the size of your group (and this being a "two week" long project). For this assignment the goal is to perform a magic trick leveraging the LEGO MINDSTORMS EV3, either having the robot perform the magic trick (e.g. autonomously) or having you (the human) perform the magic trick facilitated by some robotic mechanism. The trick only needs to work once, and from a particular angle (you will be submitting a video recording of the trick; it does *not* need to be performed live). In addition to the video of the trick being performed, you need to submit a second video documenting/demonstrating the mechanism (yes, revealing the "trick," which of course a true magician would never do!).

How Do I...?

Challenge 1: Drive the Motor forward 5 seconds and back 5 seconds

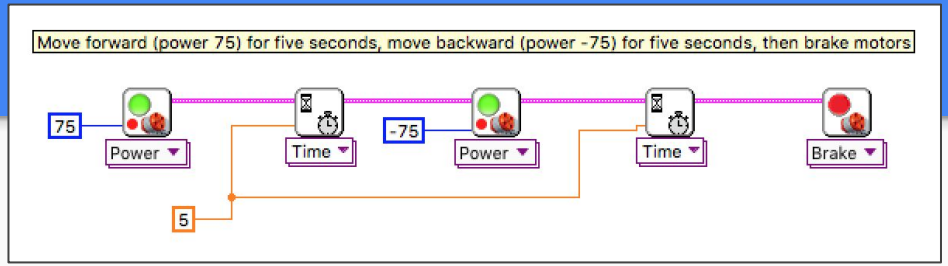
Challenge 2: Use Touch Sensor to “toggle” direction of the motor

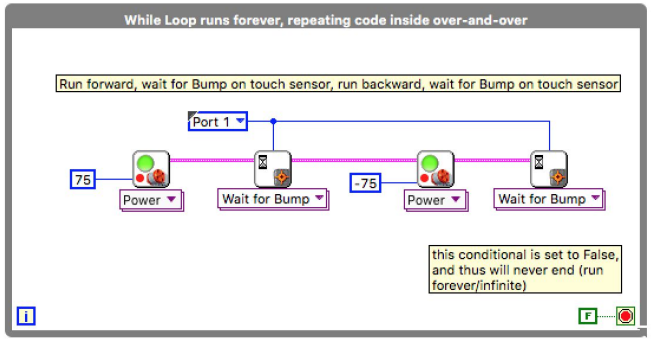
Challenge 3: The motor moves as fast as the light sensor reads

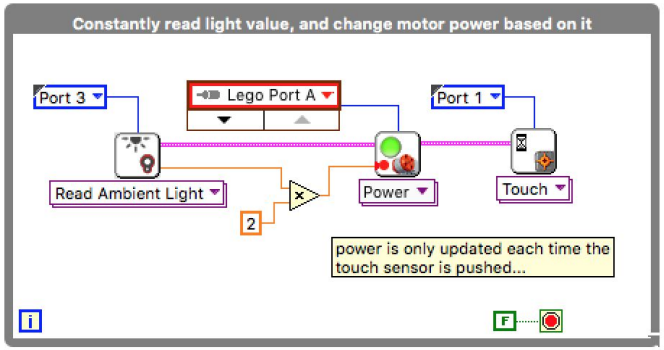
Challenge 4: Display sensor value on the EV3 Screen

Challenge 5: Display sensor value on the LabVIEW Front Panel (value? meter? graph?)

Challenge 6: Save collection of sensor data values (e.g. light value each time you click touch sensor) and export to file for analysis in Excel





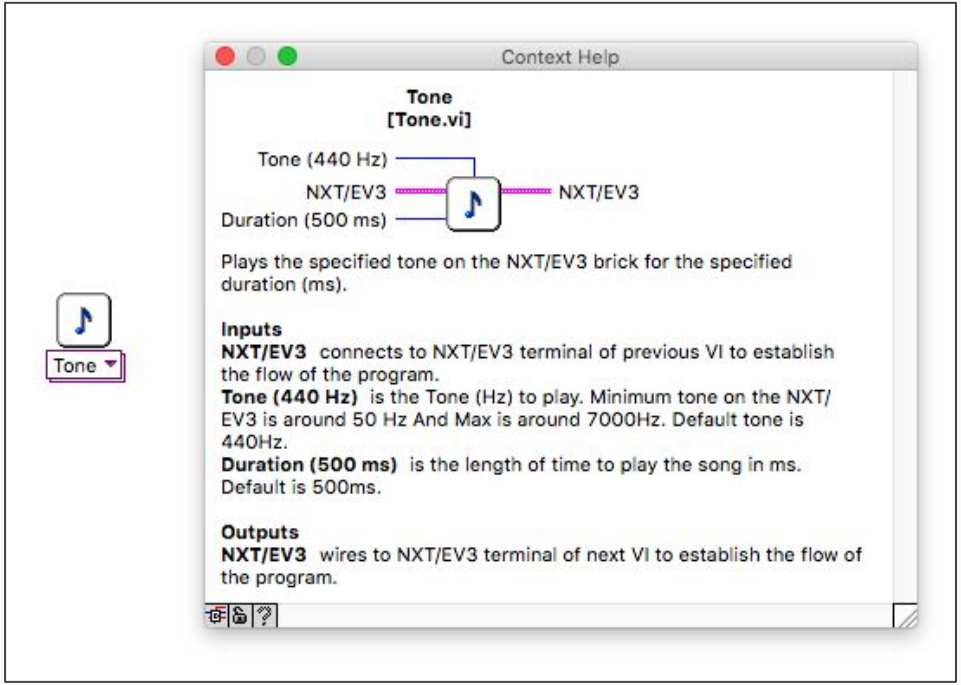


Three ideas today: Notes, Clusters, Drawing

Ability to play tones (440 Hz default)

Also:

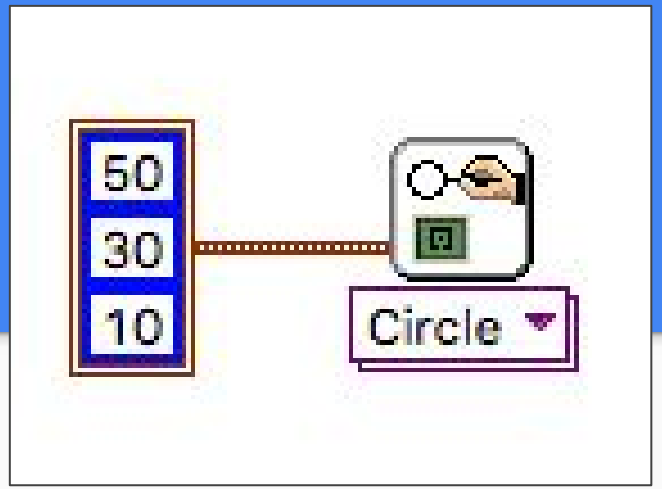
- Piano: play red, green, blue songs
- Play Sound File (.rso)
- Play Note (A,B,C…)

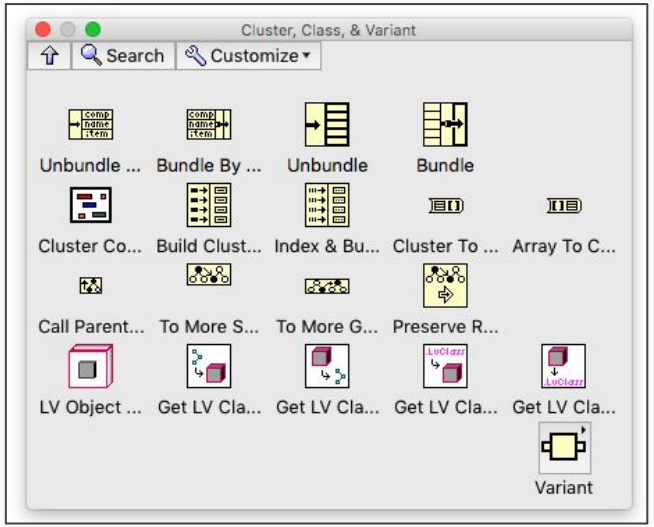


Clusters

“Bundle” Multiple Pieces of Data Together into a Cluster

- Bundle
- Unbundle





Challenges

Sound Challenges:

Challenge 1: Play Notes and Tones

Challenge 2a: Change Tone based on Light Value; scale value?

Challenge 3b: Change Tone based on Motor Value; deal with negative values?

Drawing Challenges:

Challenge 1: Draw a circle and square on the screen

Challenge 2: Move the circle based on the loop counter. Slow down loop? Keep circle on the screen?

Challenge 3: Move circle based on motor input(s). Etch-a-sketch?