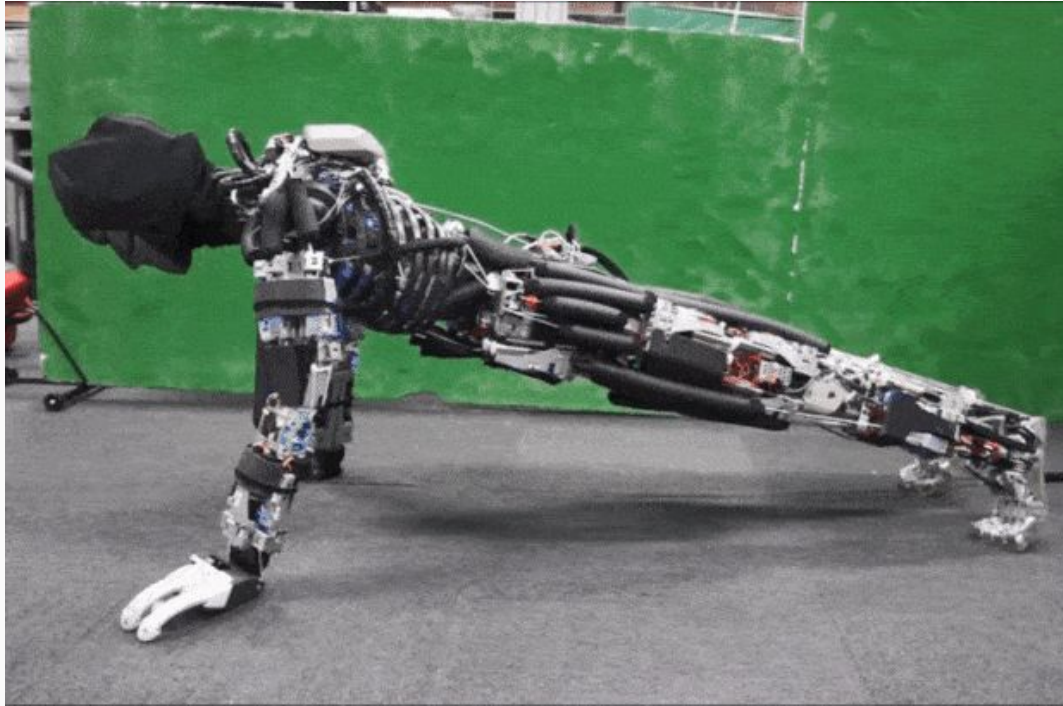# EN1-06: Simple Robotics

October 21st, 2016

Schedule

- Welcome Parents!
- In the News
- Assignment 5: Haunted House
- LabVIEW Tutorials: daisy chaining, bluetooth, drawing to screen, etc.
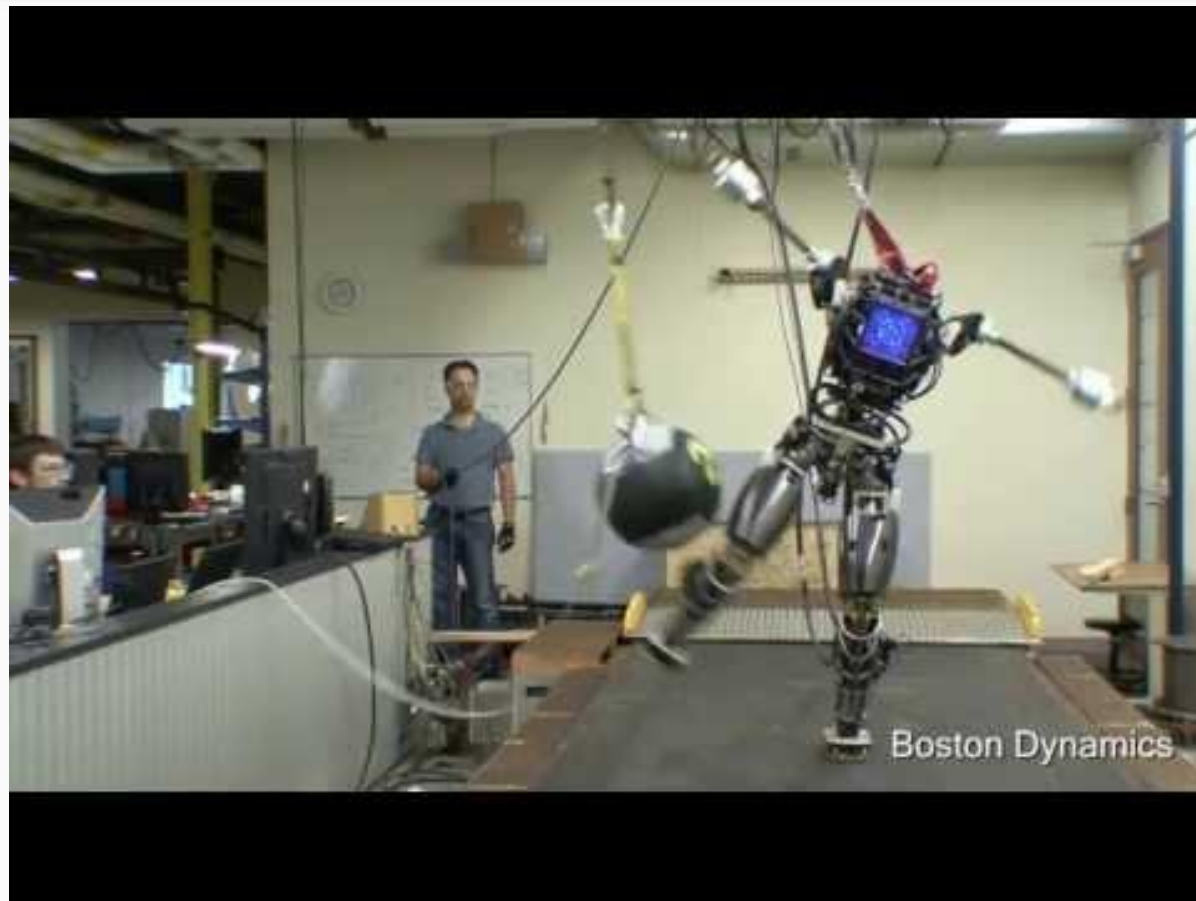- LabVIEW Intro Tutorials: getting started, first VI, wiring, loops, etc.

This Robot Can Do More Push-Ups Because It Sweats

http://spectrum.ieee.org/automaton/robotics/humanoids/this-robot-can-do-more-pushups-because-it-sweats

Assignment 5: Haunted House

Project 5: Halloween Robot   **EN1-06 Fall 2016**

In-class Haunted House (at Tufts CEEO) due on Monday, October 31st, 2016
Documentation (description, images, videos, code, etc) due to website by Mon (10/31) by 9pm

Project Description: For Halloween (Oct 31st), you are going to create interactive robotic Halloween exhibits that will be part of a Haunted House hosted by the Tufts University Center for Engineering Education and Outreach (CEEO), located at 200 Boston Ave, Suite G810.

Details (Hardware/Software): You will use your LEGO MINDSTORMS EV3 Kit for doing the sensing, thinking, and actuating (perhaps with assistance from your computer, e.g. sounds). Some Halloween themed supplies will be provided by the instructor. Beyond that, you can use any additional materials (you find or create) for implementing your Halloween robot. You will be programming your robot in LabVIEW. You can run your code in **Main Application Instance** (via the computer) or deployed **Remotely**, whichever makes more sense for your individual project.

You will be combining pairs into small groups of four to work on this project; this means your group will now have access to two MINDSTORMS kits (and thus, two EV3s and twice the motors/sensors/parts as an individual kit). Also, with twice as many participants in your group, it is expected that the complexity of the robot/project should reflect the size of your group, in physical construction and programming. Your Halloween robot should react to user input (e.g. detect when someone is near? have a pushbutton input?) and perform some appropriate reaction/response. Your code should be more complex than just "wait for sensor, initiate motors, loop"; there are multiple ways to achieve this (brick-to-brick communication, interacting with front panel controls, etc). The emphasis for this project should also be reliability, repeatability (robot needs to function for 45-minutes as multiple people interact with it), and stability.

LabVIEW Tutorials

Daisy Chaining

Bluetooth

Front Panel Picture Control

Daisychaining Multiple EV3s

You can create up to four linked EV3s (a "Master" and three of "Slaves"). Refer tutorial attached for instructions. To access sensor values on a sensor connected to a Slave, you need the "Sensor Port" constant. It is not possible to do this by "right-click > create constant" on the Read […]

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Playing Sound in LabVIEW
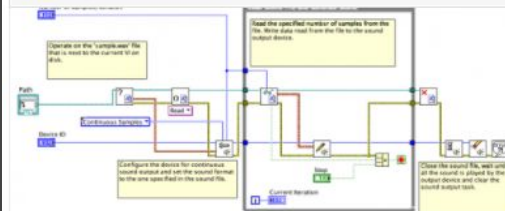
1) STEP 1: Create sound file using Audacity(http://audacity.sourceforge.net/) or similar program. Export the edited file in .wav format to your desktop. 2) STEP 2: In the Labview Front Panel, Create a path to the file (Modern— String and Path— File Path). Use the Operate Value (finger) to locate (provide a path to) your sound file on the desktop. […]

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Bluetooth with NXT

These are some tutorials used in Fall 2013 when the class used the NXT brick (the previous LEGO MINDSTORMS before the EV3) on how to do NXT-to-NXT communication (both with Bluetooth and other techniques). NXT-to-NXT Communication: https://es93-06.k12engineering.com/2013/10/10/nxt-to-nxt-communication/ Send NXT Motor Commands: https://es93-06.k12engineering.com/2013/10/17/nxt-to-nxt-send-motor-commands/ Remote Control Example: https://es93-06.k12engineering.com/2013/10/17/remote-control-two-way-communication/

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LabVIEW Intro Tutorials

Getting started: LabVIEW, Front Panel, Block Diagram, Data Flow

First VI: Motor Move, Wait For Time, Wait for Sensors

Wiring, Targeting, Run Button, Debugging: Wiring Tricks, Main Application Instance, Remote Mode, Run vs. Compile/Download, Debugging Tricks

Loops: For Loop, While Loop, Loop Conditionals