Tinker Bots Workshop

Description

- Scope: A workshop in a classroom for customizable racing(/battling) bots
- Audience: students learning basic robotics/physics
- Intended outcome: affecting movement through vibration
- Learning goals: how mass and oscillation affect movement
- Technical hurdles: lack of knowledge and experience using electrical components

Tools

- Scissors
- Hot glue gun
- Box cutter
- Gluestick
- Pliers
- Cutting pliers

Materials

- 2 Motors for vibration
- 2 potentiometers for controlling the current, i.e. speed of each motor
- A Base for the pieces to attach to. The base can then be glued to different bodies.
- Modular race track pieces (made by themselves e.g. from cardboard)
- Robot body building materials (plastic straws, plastic bases with holes, metal wire, paperclip, wooden skewers, icecream sticks, wooden spoons, rubber bands, tape, cork, eraser, wooden stick with holes, zipties)

Planning

Timetable

Introduction and task explanation	10 minutes
Building robot iteration #1	20 minutes
Racing iteration #1 (simple straight track)	5 minutes
Building robot iteration #2	20 minutes
Racing iteration #2 (track with a bend)	5 minutes

Retrospect on learnings and feedback	10 minutes
Tearing down and cleaning up	10 minutes
Total	**1h 20 minutes**

Location and setup

- Classroom
- 3-4 member groups of attendees
- 1 table per group with tools and materials provided

Instructions

Explanation of session timetable and phases

- Introduction
- Building & racing iteration #1
- Building & racing iteration #2
- Retrospect on learnings and cleanup

Explanation of electrical components

- Motor
- Potentiometer
- MOSFIT

Explanation of robot objectives

- Should move on its own without outside help or assistance (controlling motor intensities during movement is allowed)
- Can complete differently shaped race tracks reliably and efficiently
- Give your robot some style with a personality (creature, animal, etc.)

Facilitation

One assistant per group for…

- …keeping track of time
- …making sure the groups complete two distinct iterations and corresponding races
- …helping with materials and tools
- …providing necessary tips if producing any vibration at all is too difficult
- …making sure no irrevocable damage is done to the electrical components or base plate