Desktop Fan Project
Introduction

Living with the Lab
Desktop fan workshop
ASEE 2012 Conference
Primary Learning Objectives

- Assemble circuits to drive a small DC motor and a servo motor
- Control the DC motor speed with PWM
- Sweep the servo back and forth
- Control the motor speed with a potentiometer

Bonus Objective

- Toggle the motor on and off with a momentary button
What can you do with this?

Domlout Starter Kit for Arduino

http://oomlout.co.uk/arduino-starter-kit-ardx-p-183.html
What can you do with this?

Adafruit Experimentation Kit for Arduino

http://www.adafruit.com/products/170
What can you do with this?

Sparkfun Inventor’s Kit for Arduino

http://www.sparkfun.com/products/10173
Make an oscillating fan from these parts.
Design and build a fan to satisfy these objectives

- A desktop toy for promoting my company
- Air flow direction oscillates
- Fan has on-off button
- Fan speed is variable
- Be creative: I want to like this fan!
Show the students an answer

- Students need to learn skills to imitate the “answer”
- Most students don’t want to imitate the design
- Several aspects of the structure are left unspecified
Show the students an answer

❖ Students need to learn skills to imitate the “answer”
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To complete the project students must

❖ Learn how to use Solidworks (or similar tool) to draw the structure
❖ Measure parts in order to make the structure fit
❖ Learn how to write loops and other programming structures
❖ Learn how to debug, because it doesn’t work the first time
❖ Learn how to make a presentation to explain their design to the rest of the class
❖ Work on a team, because there is too much work for one person
Assembled for workshop participants

- Laser cut acrylic base and fan strut
- Extension leads on DC motor
- DC motor secured with zip ties
- Servo mounted with snap rivets
- Strut screwed to the servo horn
Today we will focus on

- Getting the DC motor circuit working
- Connecting the Servo
- Playing with loops and delays to control sweep speed
- Connecting a potentiometer to control fan speed
- Connecting a button or switch to toggle the fan on and off