

Desktop Fan Project

Introduction

Living with the Lab
Desktop fan workshop
ASEE 2012 Conference

Learning Objectives

Primary Learning Objectives

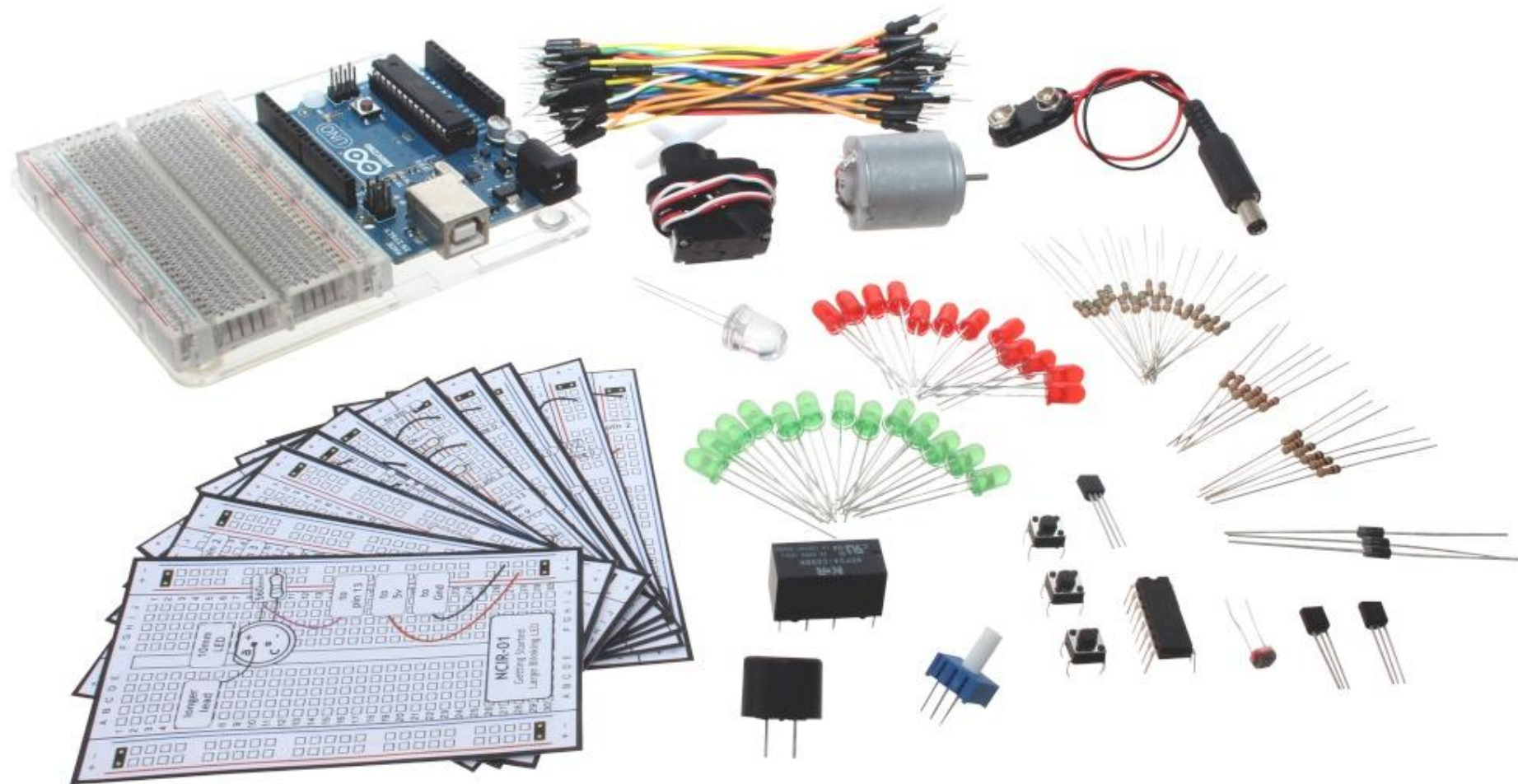
- ❖ Assemble circuits to drive a small DC motor and a servo motor
- ❖ Control the DC motor speed with PWM
- ❖ Sweep the servo back and forth
- ❖ Control the motor speed with a potentiometer

Bonus Objective

- ❖ Toggle the motor on and off with a momentary button

What can you do with this?

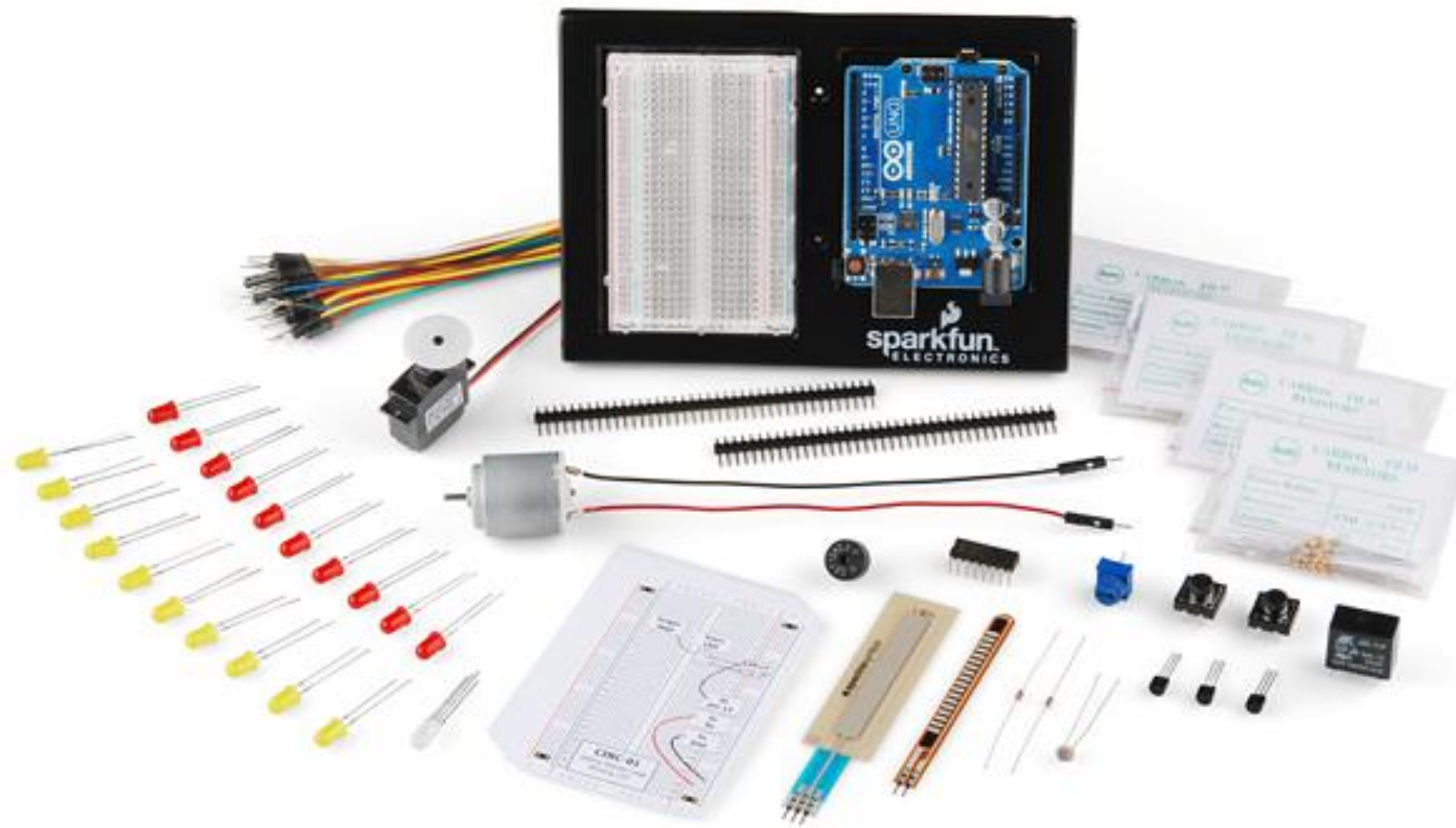
Oomlout Starter Kit for Arduino



<http://oomlout.co.uk/arduino-starter-kit-ardx-p-183.html>

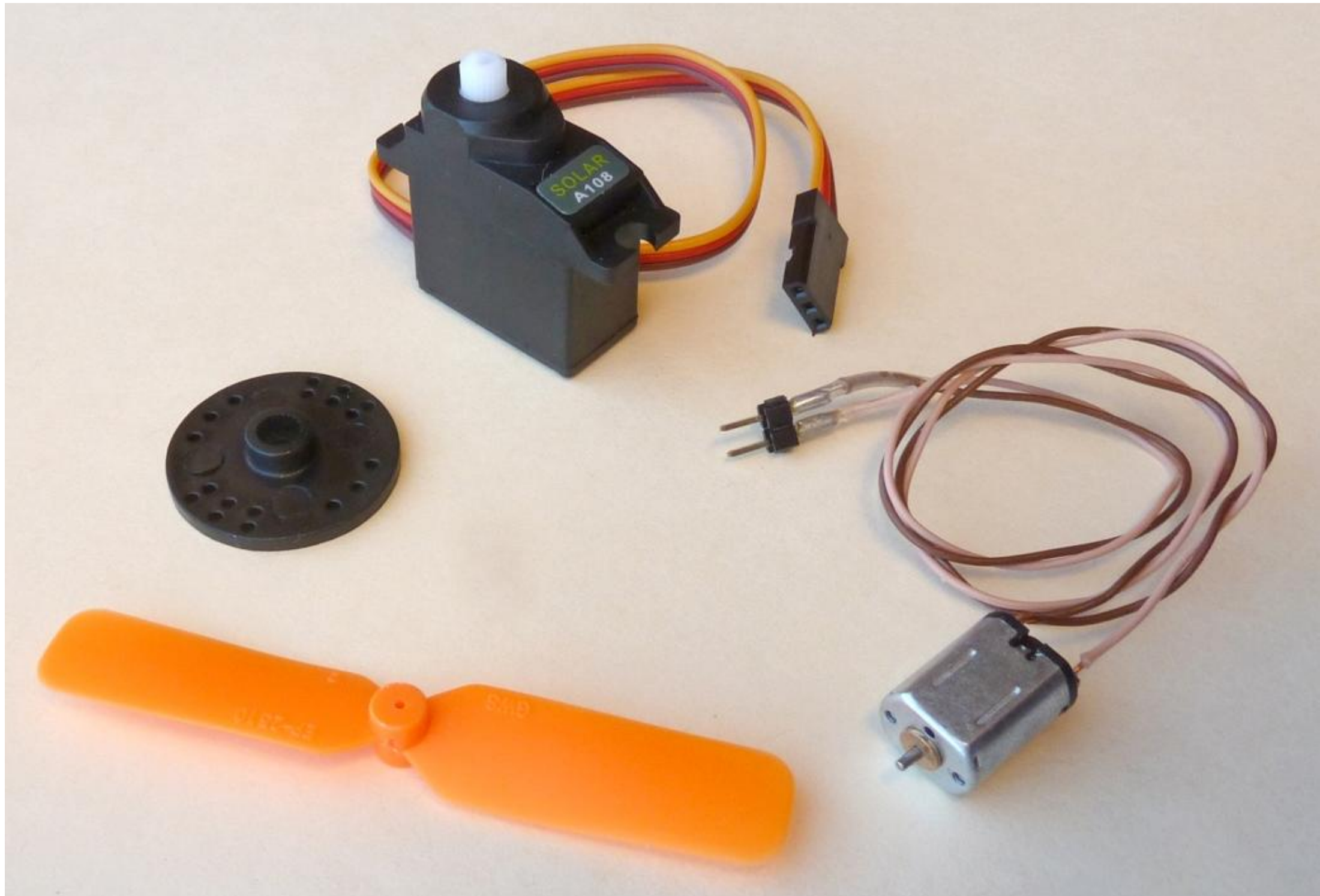
What can you do with this?

Sparkfun Inventor's Kit for Arduino



<http://www.sparkfun.com/products/10173>

Make an oscillating fan from these parts



Project for students

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!



“Pull” model of project based instruction

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

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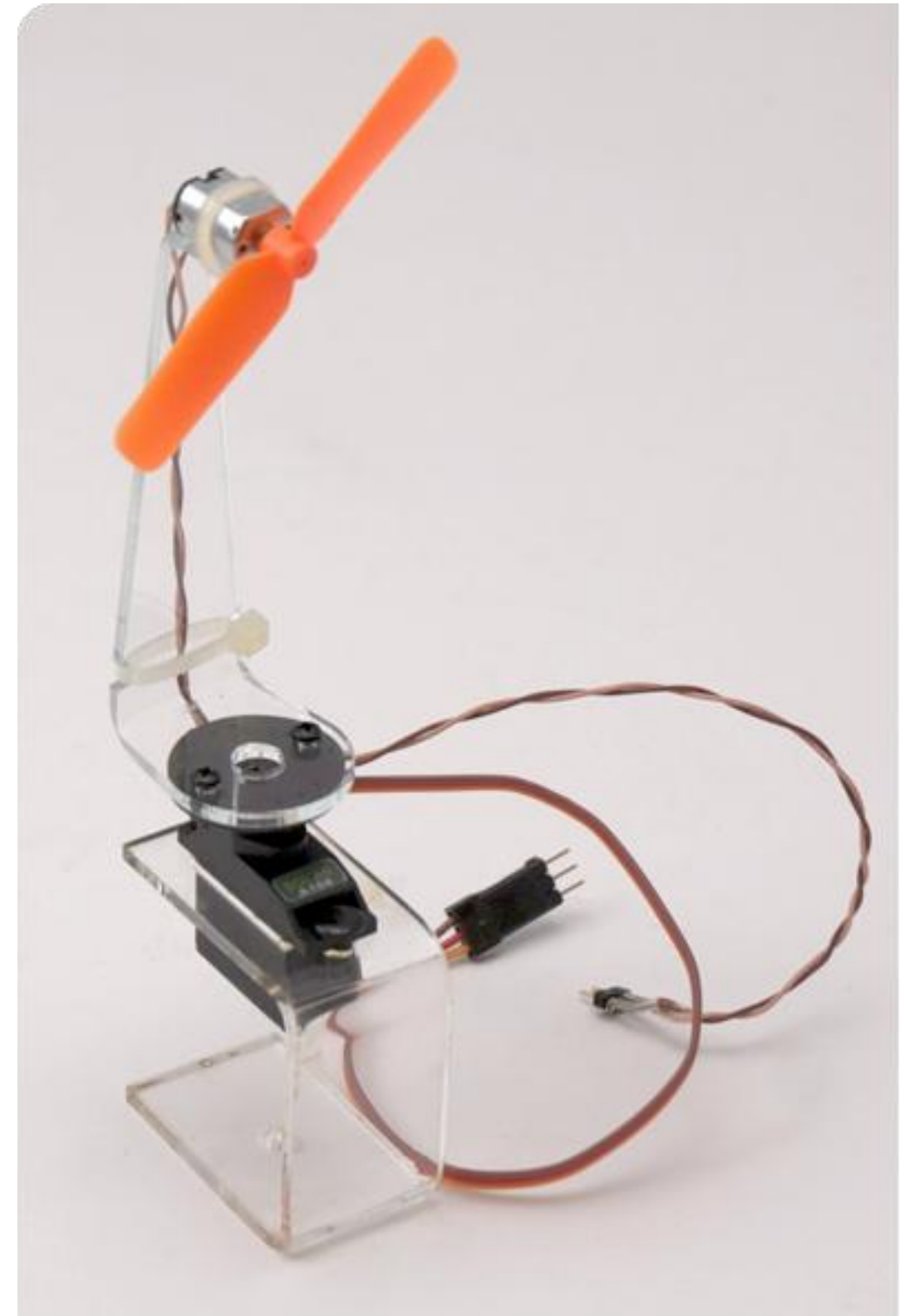
To complete the project students must

- ❖ 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

DC Fan Assembly

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



Focus on wiring and programming

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