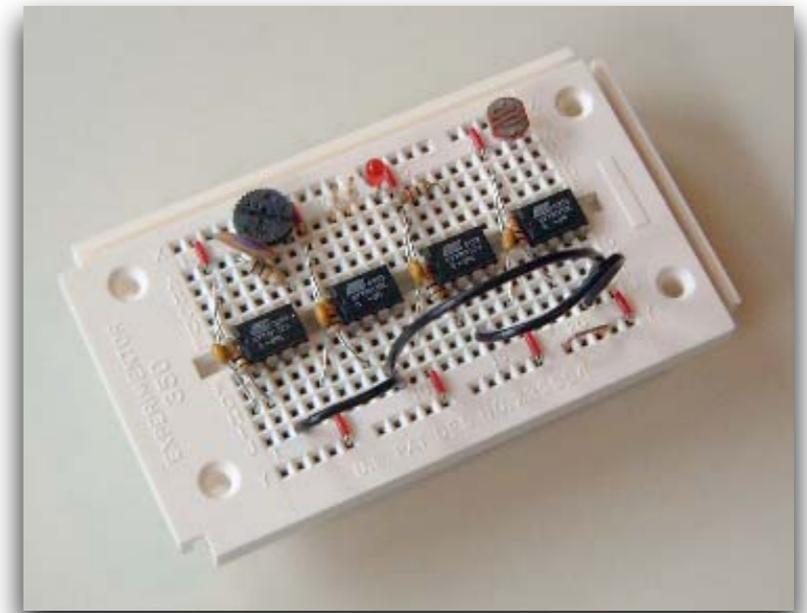
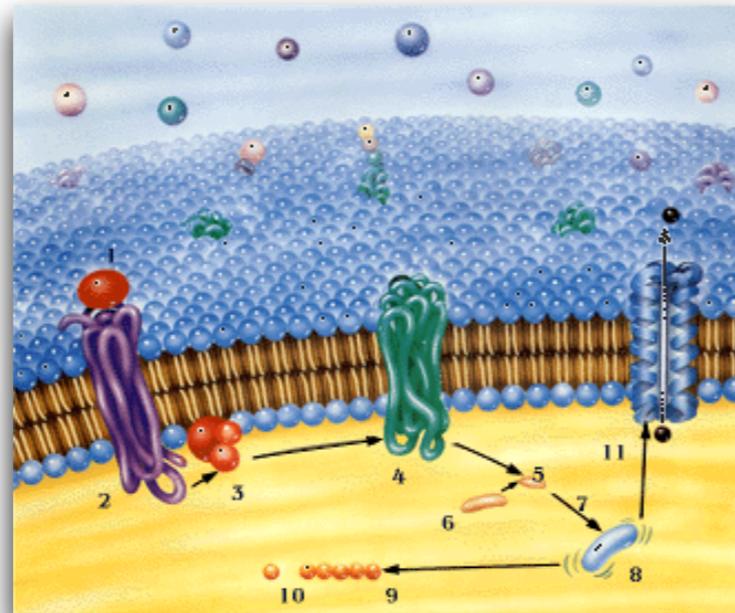


What If Bacteria Designed Computers?

Introducing Cybords
and Bynase

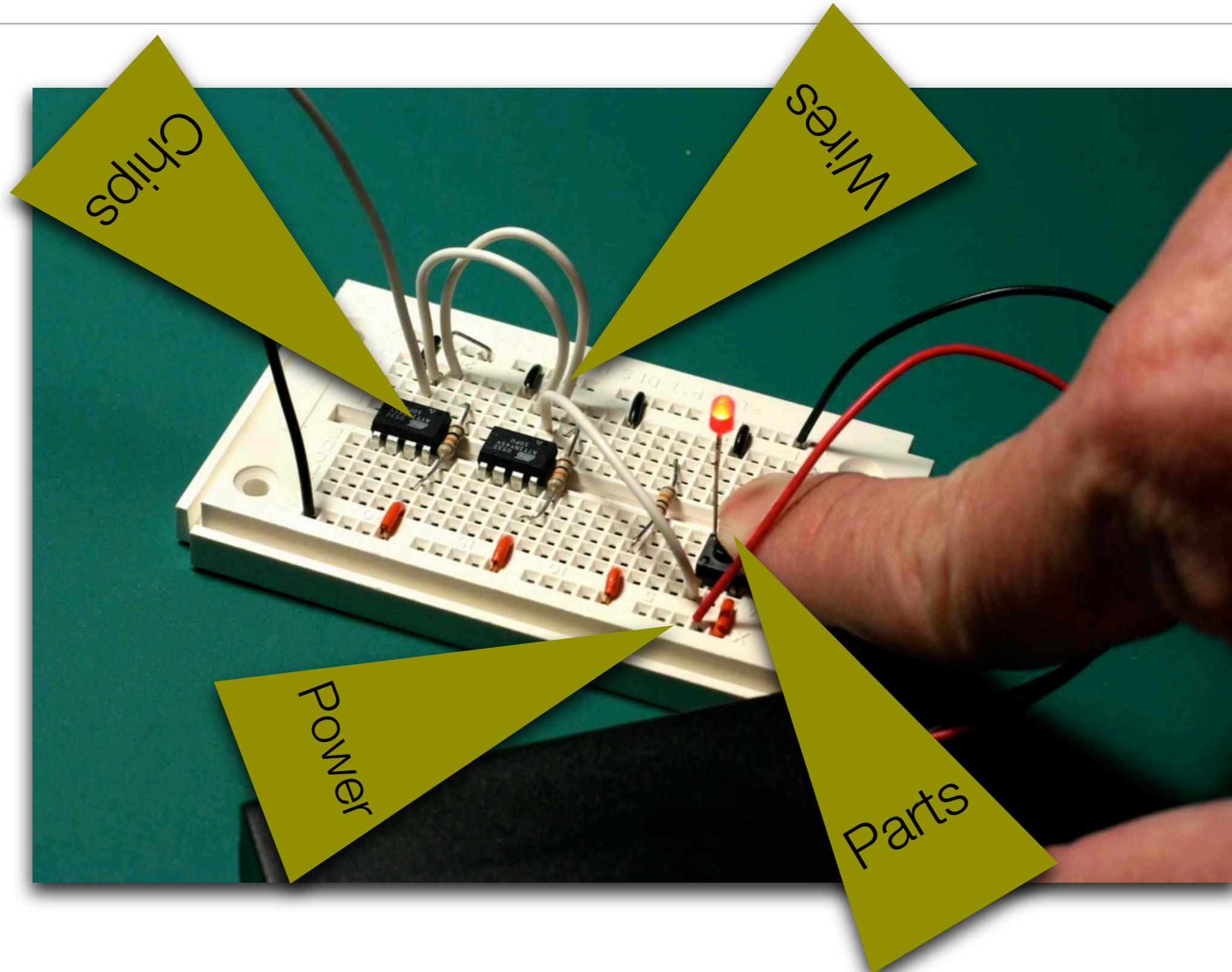
Ward Cunningham
DorkbotPDX 0x01



American Glory



Cybords



Bynase

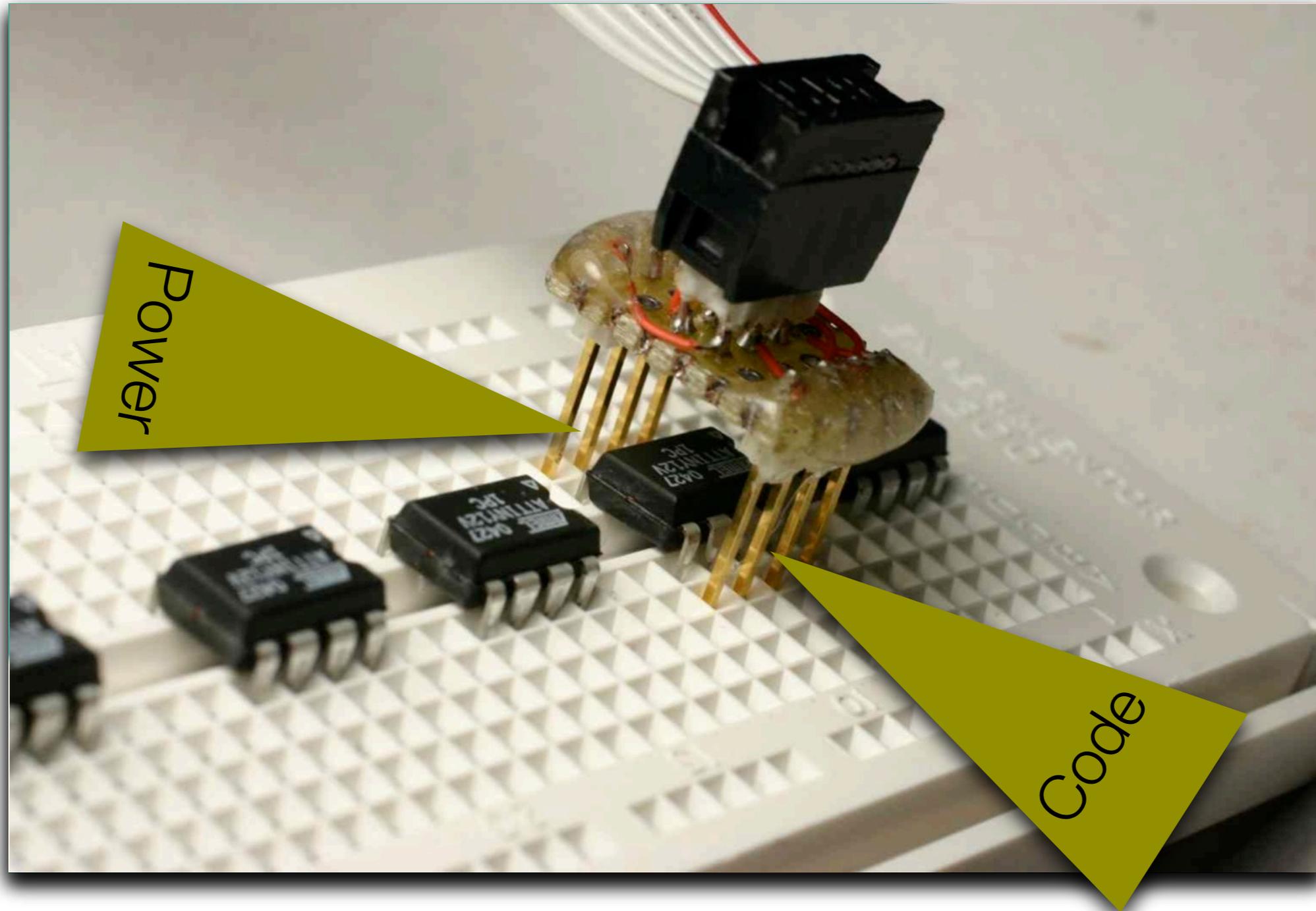
send

```
while true
  if value < random
    pulse low
  else
    pulse high
```

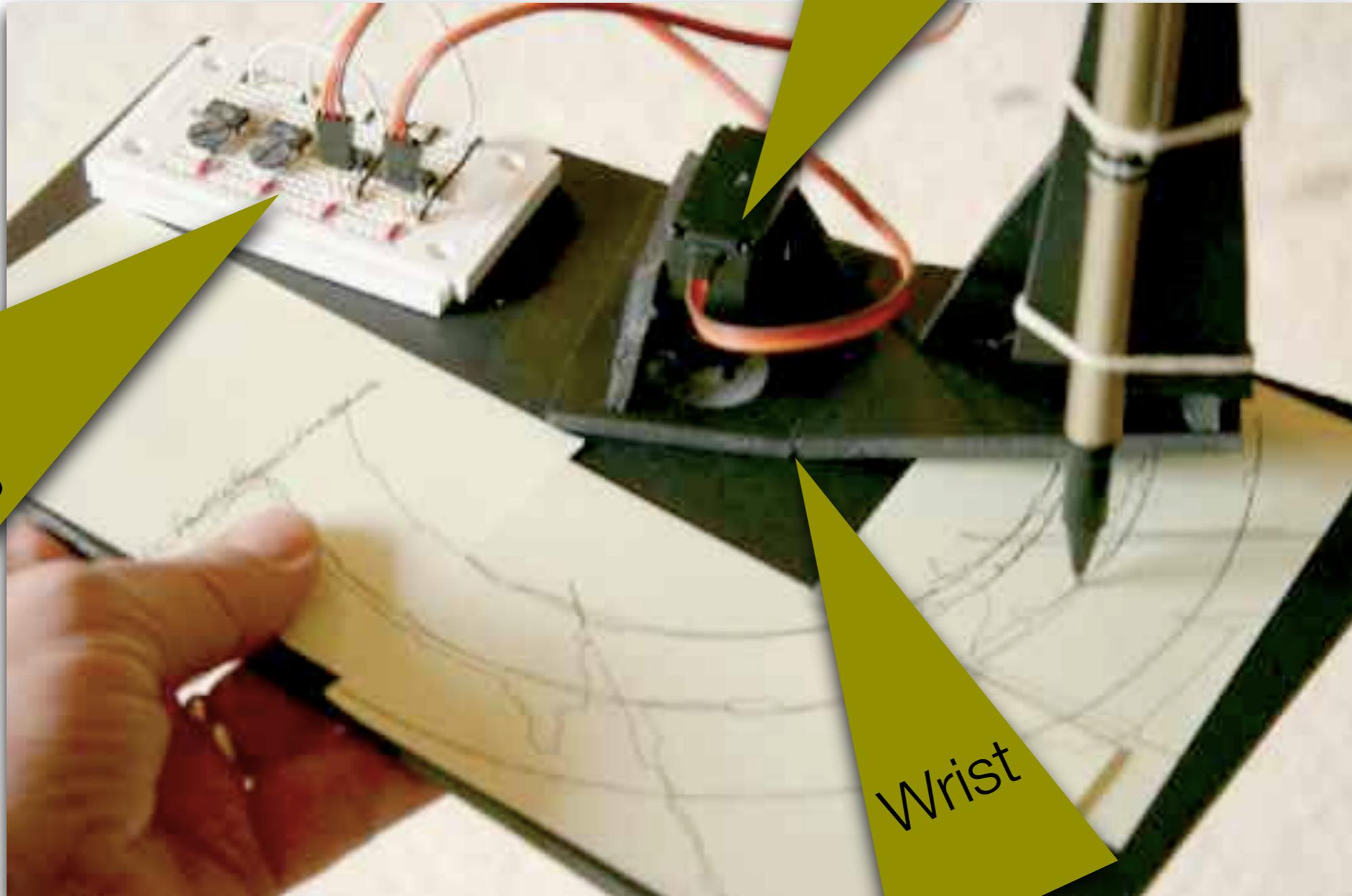
receive

```
result = 0
for 100 times
  if input is high
    result = result + 1
```

Construction Technique



Hand Writing Device



Motor

Chips

Wrist

Graffiti Research Laboratory

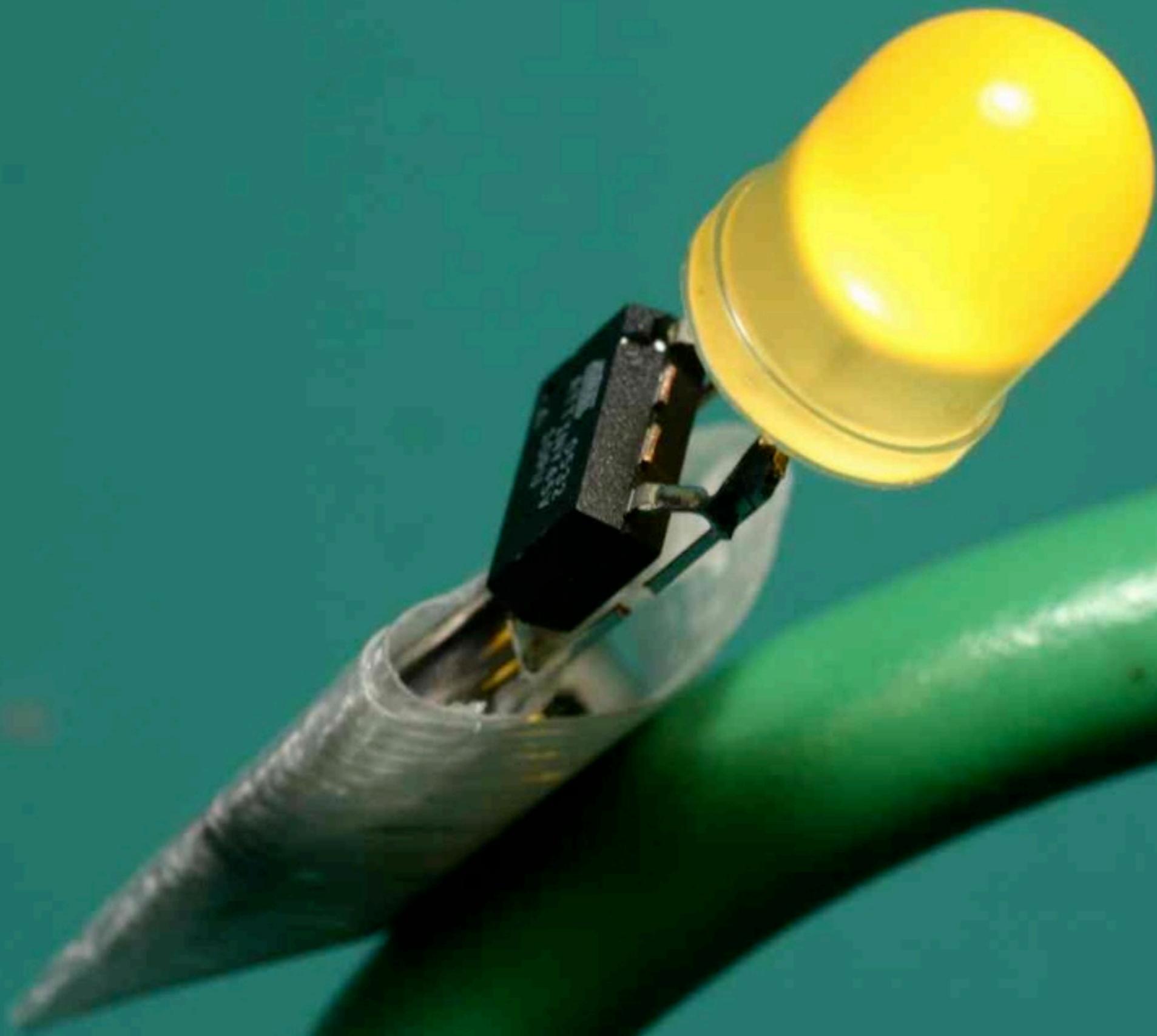
Throwies



Throwie
Talkie

Ars Electronica, Linz

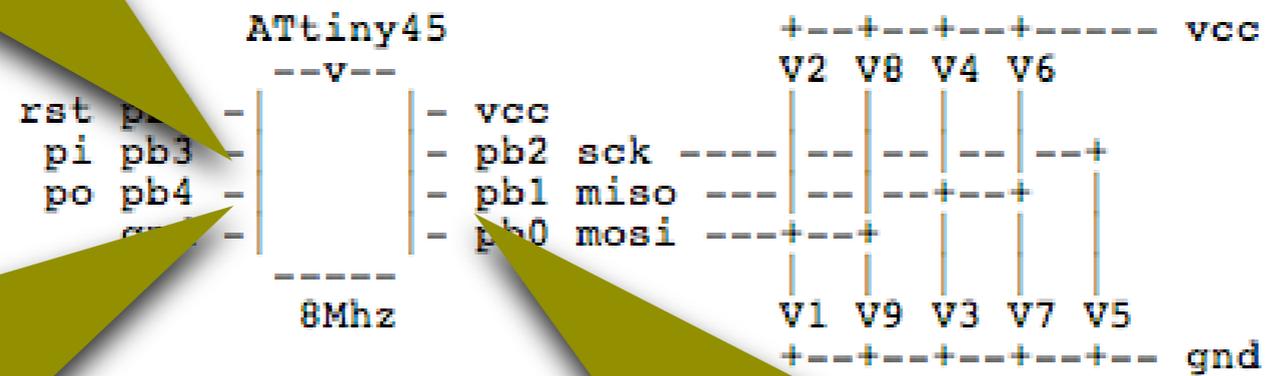




Standard Input and Output

Input

```
This program rolls a die at speed
determined by pi. The die face value
is output on po = 0.2*(face-1).
```

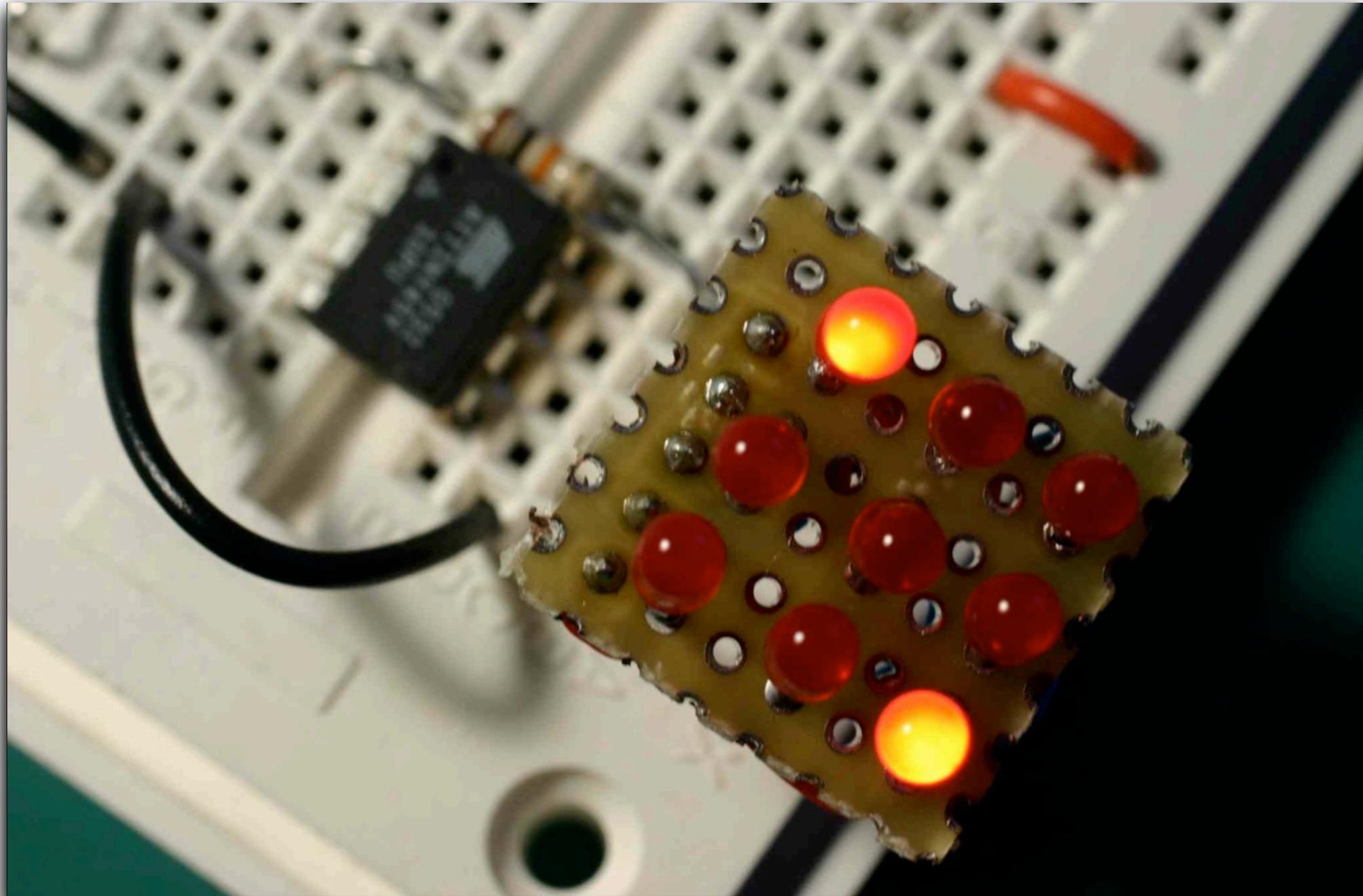


(c) 2008 Ward Cunningham
Released under GPL v2 or later

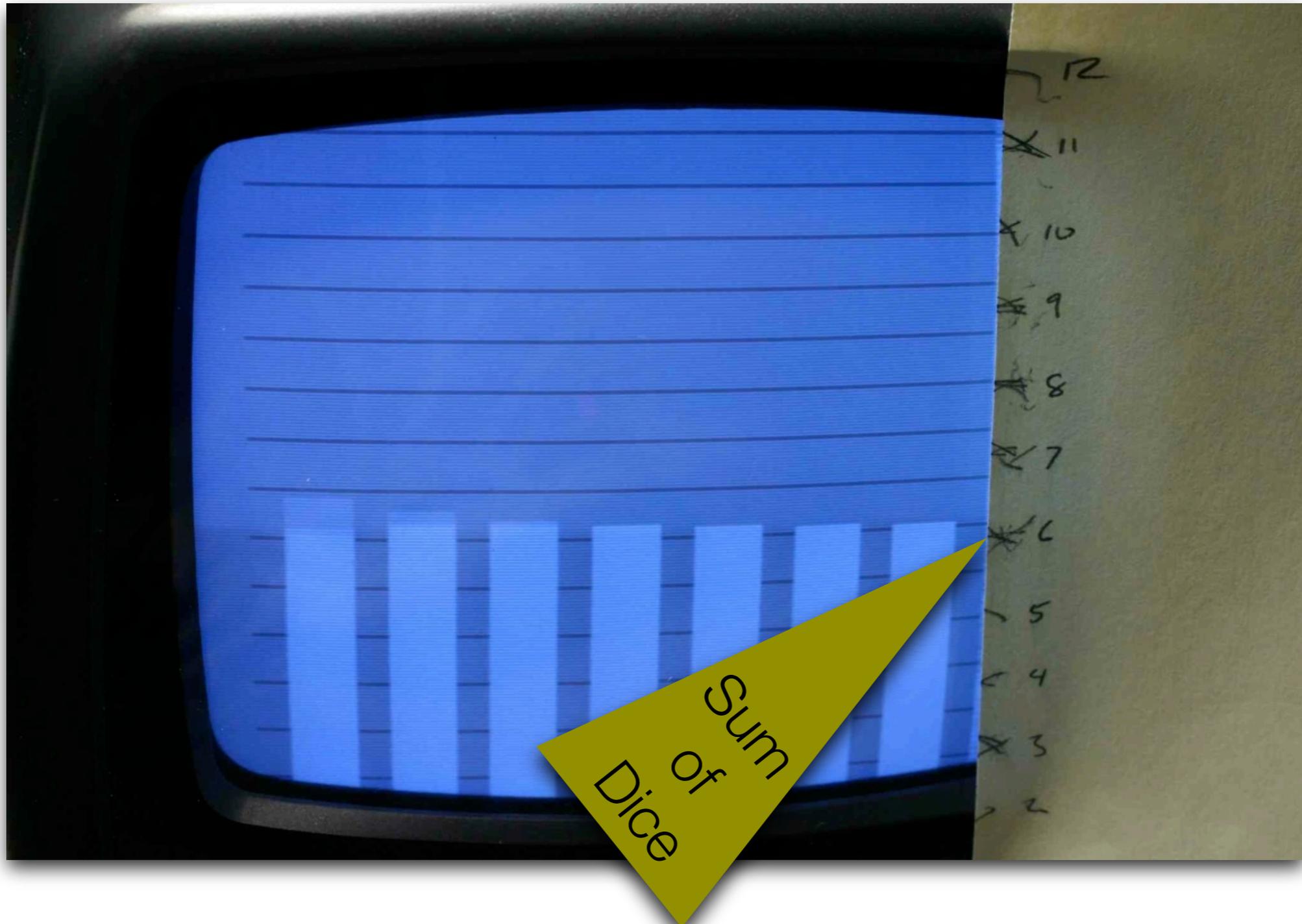
Output

Three
More
Pins

Animated Display



Random Variables



Free Web Site

Search for Cybords

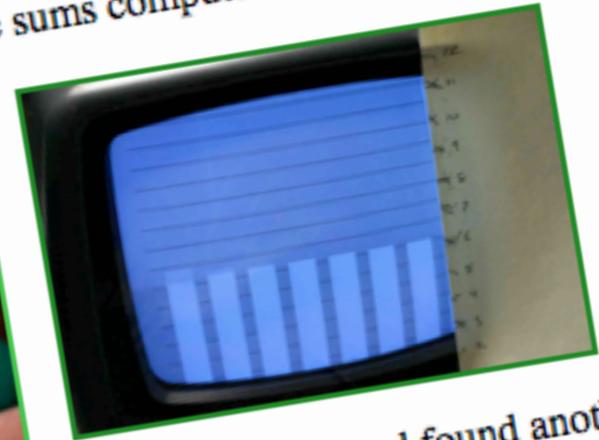
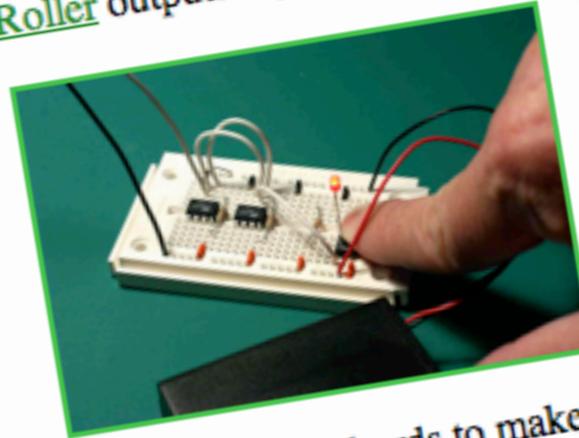
<http://c2.com/cybords>



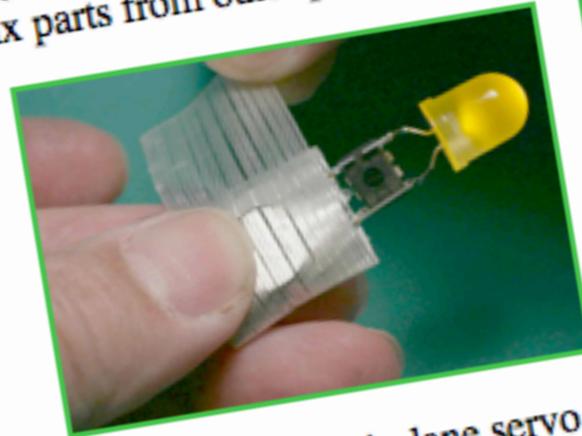
Welcome Visitors

This experimenter friendly site supports the development and distribution of biologically inspired, Bynase enabled, circuits called Cybords.

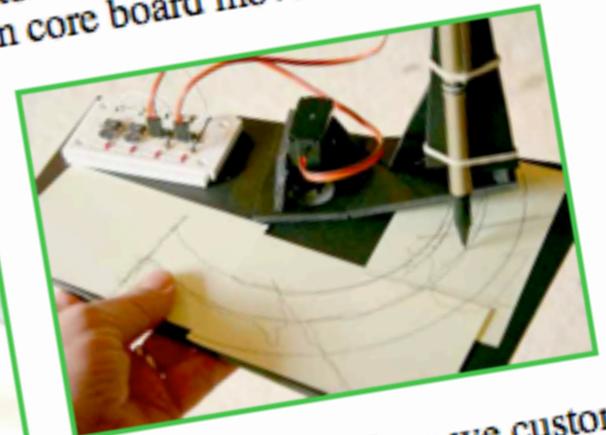
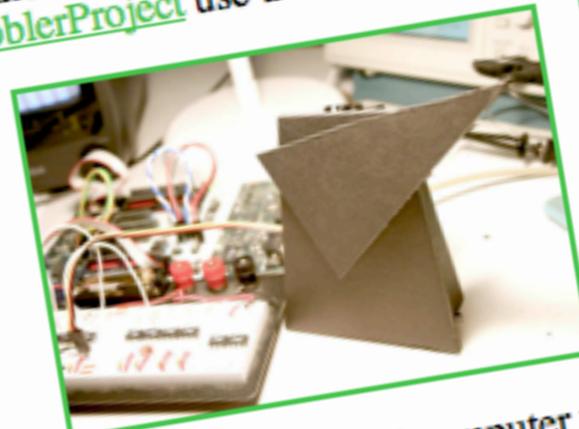
We've been experimenting with a part that simulates a rolling die. We can hook [DiceRoller](#) outputs together and get the sums computed for "free".



We've mashed up Cybords to make the [ThrowieTalkie](#) and found another way to mix parts from other projects to explore [VideoFeedback](#).



We like using model airplane servo motors. [ServoPointerProject](#) and the [ScribblersProject](#) use them to make foam core board move in interesting ways.



computer for everything. But, since we customize the different parts. We distribute the work.

Science, March 2008

ered Scaffold ape MAP Kinase Dynamics

A Synthetic negative feedback

A Synthetic positive feedback

A MAPK MAPK MAPK

B Time course

A Constitutive expression of DECOY zipper (high affinity)

B Vary rec

C Var

A DECOY COMPLEX

B Constitutive expression of positive modulator

C Constitutive expression of negative modulator

A Inducible expression of negative modulator

B Inducible expression of high affinity negative modulator

C DECOY COMPLEX

Pulse Generator

Transcriptional activity (fluorescence / min)

Time (min)

WT

Decoy zipper expression: high low none

phospho-Fus3

0 30 60 90 120 150 min

Accelerator

Transcriptional activity (Fluorescence / min)

Time (min)

WT

Circuit

Neg. feedback only

Delay

activity (min)

Decreasing

bling them into serving as the strate that the of the yeast back loops by site on Ste5. accelerated or e platform for vel therapeutic

Such feedback response and over time. Quantil for signaling; atch its specific ds may thereonarily tuning less (5, 6). approach to ed whether a a platform for ps and what

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