



Cake

Chris Cross and Rob Spanton



Robots Need Brains!

STUDENT
ROBOTICS





Simple Rules



STUDENT
ROBOTICS

Stand Up



Simple Rules

STUDENT
ROBOTICS

- Blue: Pass back
- Red: Pass forward
- Yellow: Pass to **your** right
- Green: Pass to **your** left





Switch off
your robots!

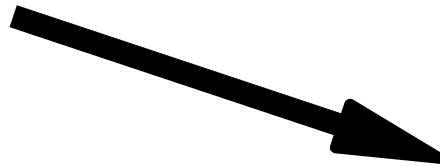
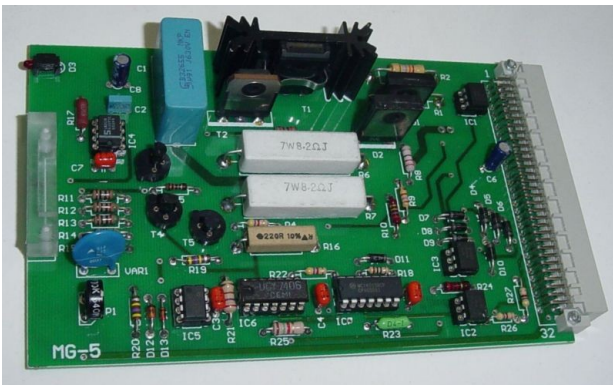




Robot Software

STUDENT
ROBOTICS

How to bring your Robot to life.







Instructions

STUDENT
ROBOTICS

- Set oven to gas mark 4
- Mix ingredients
- Put in tin
- Put tin in oven



Loops

STUDENT
ROBOTICS

Cook in oven until baked



Conditionals

STUDENT
ROBOTICS

If chocolate cake then add chocolate



Processing

STUDENT
ROBOTICS





Python

STUDENT
ROBOTICS





RoboIDE

STUDENT
ROBOTICS

Logout Team: 1 *Unnamed team*

Forums

Switchboard

v Projects

x Switchboard

Project: badger v

New Project

Archive Project

Copy Project

Check Code

Simulate Project

Export Project

Select a date v

<< September 2009 >>						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Selection operations:

Select None

Select All

New File

New Directory

Move (including rename)

Copy

Delete

Undelete

Delete Autosaves

Check Files' Syntax

View Log

Project badger

Ctrl+Click to Select (Cmd+Click on a Mac)
Click to Open

bee-dogs/
| new.py
new.py
robot.py



RoboIDE: Projects

STUDENT
ROBOTICS

Logout Team: 1 ▾ *Unnamed team*

Forums

Switchboard

v

Projects

Project: badger ▾

New Project

Archive Project

Copy Project

Check Code

Simulate Project

Export Project

Select a date

<< September 2009 >>						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Selection operations:

Select None

Select All

New File
New Directory
Move (including rename)
Copy
Delete
Undelete
Delete Autosaves
Check Files' Syntax
View Log

New Project

Enter new project name:

new-project

Save

Cancel

new.py
new.py
robot.py



RoboIDE: Edit

STUDENT
ROBOTICS

Logout Team: 1 *Unnamed team*

[Forums](#)

[Switchboard](#)

v

Projects

x Switchboard

x /badger/robot.py

Save

Check Syntax

Close

/badger/robot.py - r4

Select File Revision

```
1 from python import *
2
3 def main():
4     print "i'm a robot"
5
```

Position: Ln 1, Ch 1 Total: Ln 5, Ch 58



RoboIDE: Versioning

STUDENT
ROBOTICS

Logout Team: 1 *Unnamed team*

Forums Switchboard

Projects */badger/robot.py*

Warning: File not modified!

Save Check Syntax

Commit Message:

Another helpful message to describe what you did

Please add a commit message before saving

Save

Cancel

```
1 from python import *
2
3 def main():
4     print "i'm a robot"
5
6     print "i'm still a robot"
7
8     print "I'm still a robot"
9
```



RoboIDE: History

STUDENT
ROBOTICS

Logout

Team: 1 **Unnamed team**

Forums

Switchboard

v

Projects

x /badger/robot.py

x Log: /badger/robot.py

File history loaded successfully

Revert

Close

Filter by user



<<< Older

Newer >>>

Displaying 3 revision(s) between 12:31:55 19/09/2009 & 12:40:58 19/09/2009 Page 1 of 1

☐ r6 | Robert Spanton <rspanton@zepler.net> | 12:40:58 19/09/2009

Another helpful message to describe what you did

☐ r5 | Robert Spanton <rspanton@zepler.net> | 12:40:30 19/09/2009

A helpful message to describe what you did

☐ r4 | Robert Spanton <rspanton@zepler.net> | 12:31:55 19/09/2009

a helpful commit message to remind me what i just did!



Documentation

STUDENT
ROBOTICS

<http://www.studentrobotics.org/>

Available shortly



Forums

STUDENT
ROBOTICS



studentrobotics.org

A forum for Student Robotics participants

[Board index](#)

▼A^

[FAQ](#) [Register](#) [Login](#)

It is currently Sat Sep 19, 2009 12:32 pm

This board has no forums.

LOGIN • REGISTER

Username: Password: | Log me on automatically each visit ☐

WHO IS ONLINE

In total there is 1 user online :: 0 registered, 0 hidden and 1 guest (based on users active over the past 5 minutes)
Most users ever online was 3 on Sat Aug 15, 2009 6:38 pm

Registered users: No registered users

Legend: *Administrators*, *Global moderators*

STATISTICS

Total posts 4 • Total topics 1 • Total members 6 • Our newest member **hbuck**

[Board index](#)

[The team](#) • [Delete all board cookies](#) • All times are UTC [DST]

Powered by [phpBB](#) © 2000, 2002, 2005, 2007 phpBB Group



Loading Software

STUDENT
ROBOTICS

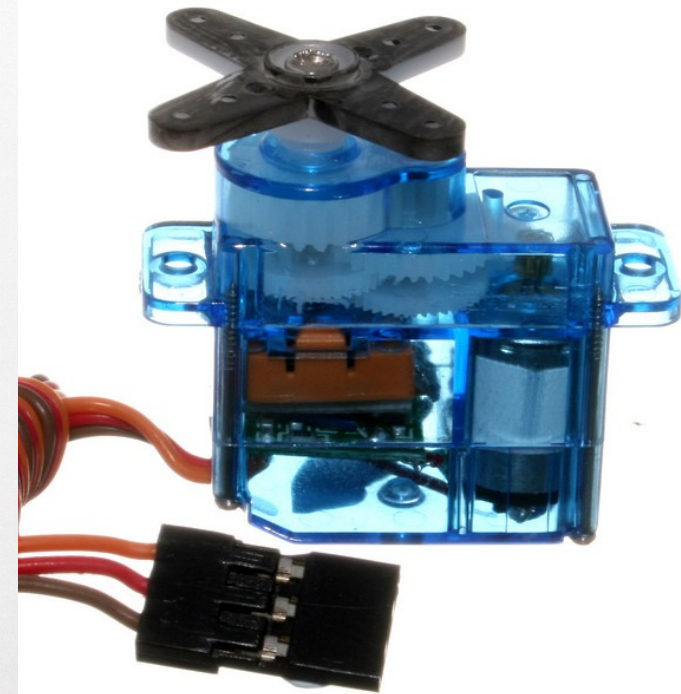
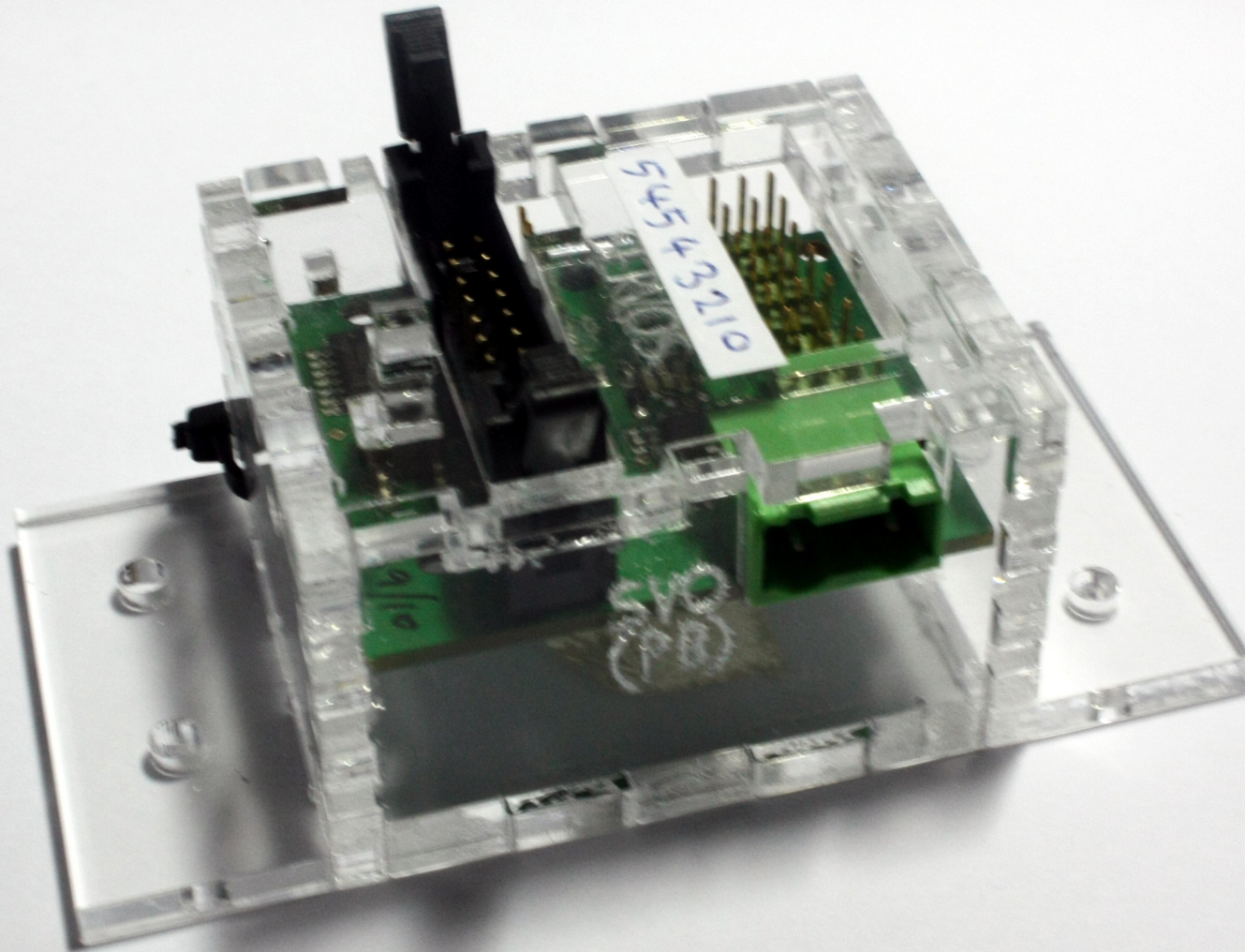




PWM Board

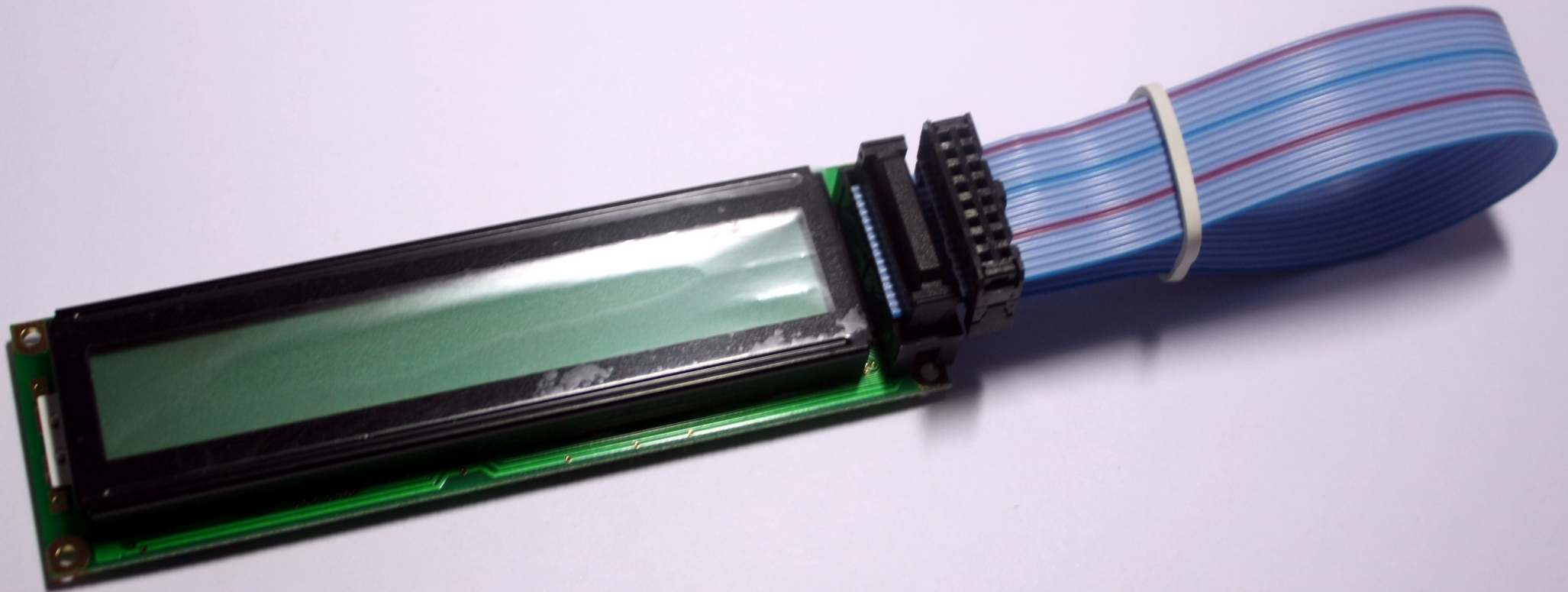
STUDENT
ROBOTICS

- Controls servos





STUDENT
ROBOTICS

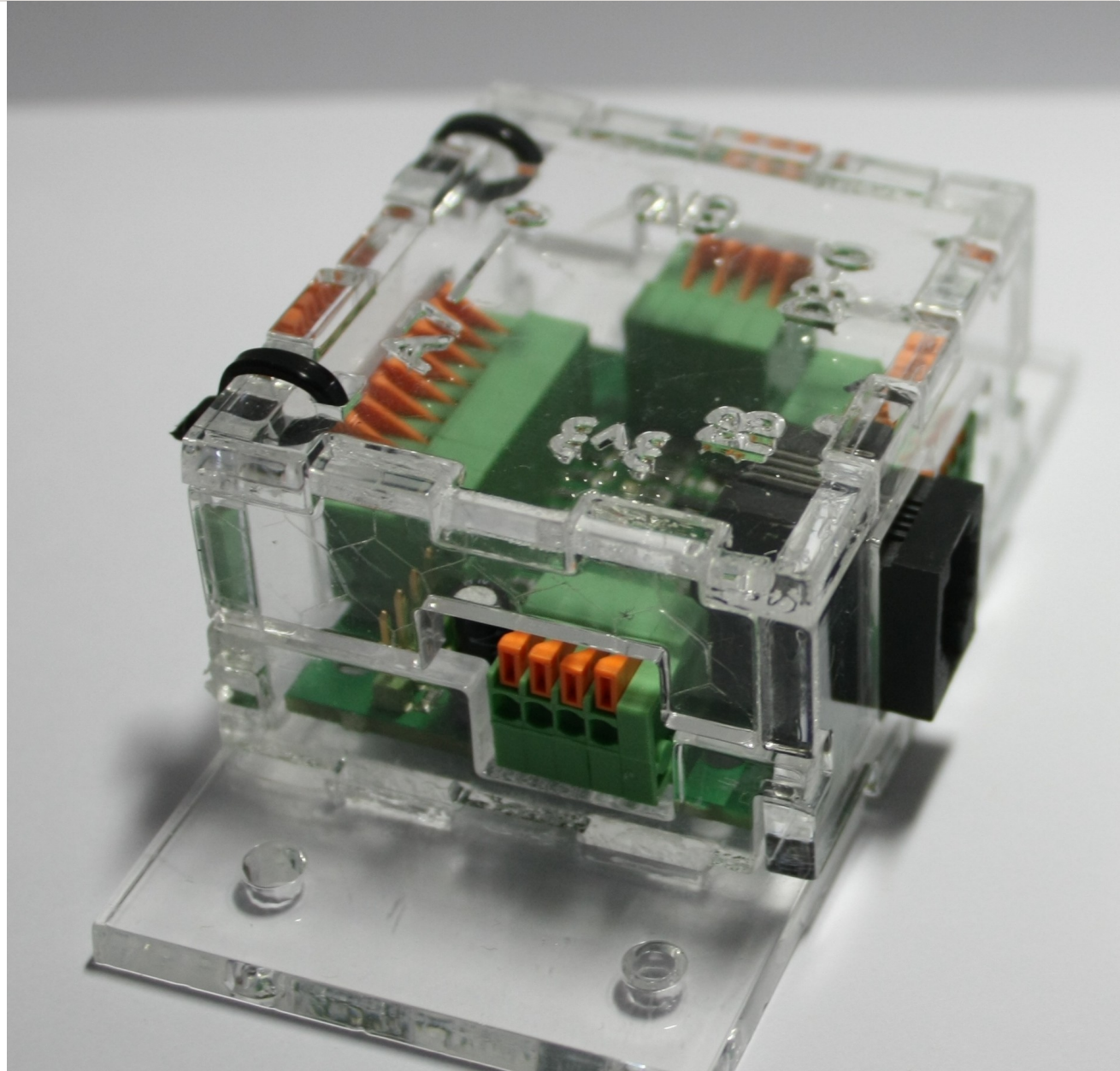




JointIO Board

STUDENT
ROBOTICS

- Digital inputs
- Analogue inputs
- Digital outputs

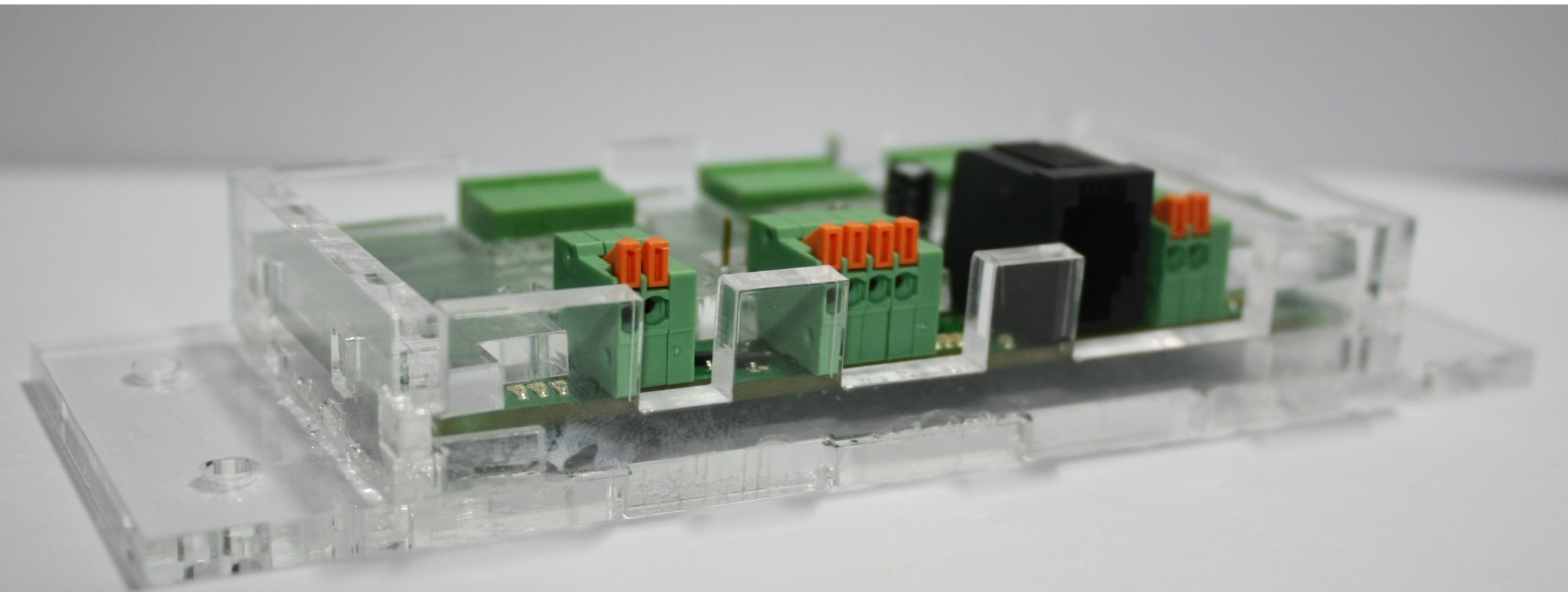




Motor Board

STUDENT
ROBOTICS

- Control power to two motors
- 12V DC motors





Feedback

STUDENT
ROBOTICS

- Power
- “PID Controller”
 - Absolute positioning
- Magnetic rotary sensors



Vision

STUDENT
ROBOTICS





Vision

STUDENT
ROBOTICS

- Detect coloured blobs
 - Red, blue, green
 - Size
 - Position
- White background!
- Ignores black



Vision

STUDENT
ROBOTICS

```
from sr import *

def main():
    while True:

        yield vision()

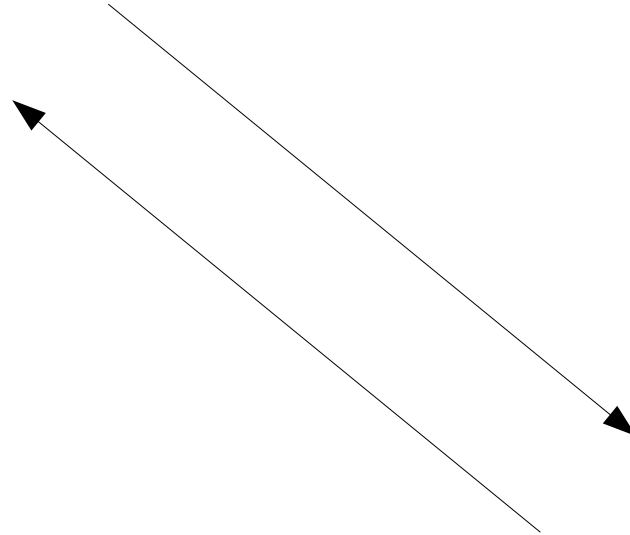
        for blob in event.vision.blobs:
            if blob.colour == RED:
                print "I saw a red token :-)"
```



Development Cycle

STUDENT
ROBOTICS

Build



Test

times a million.



Debugging

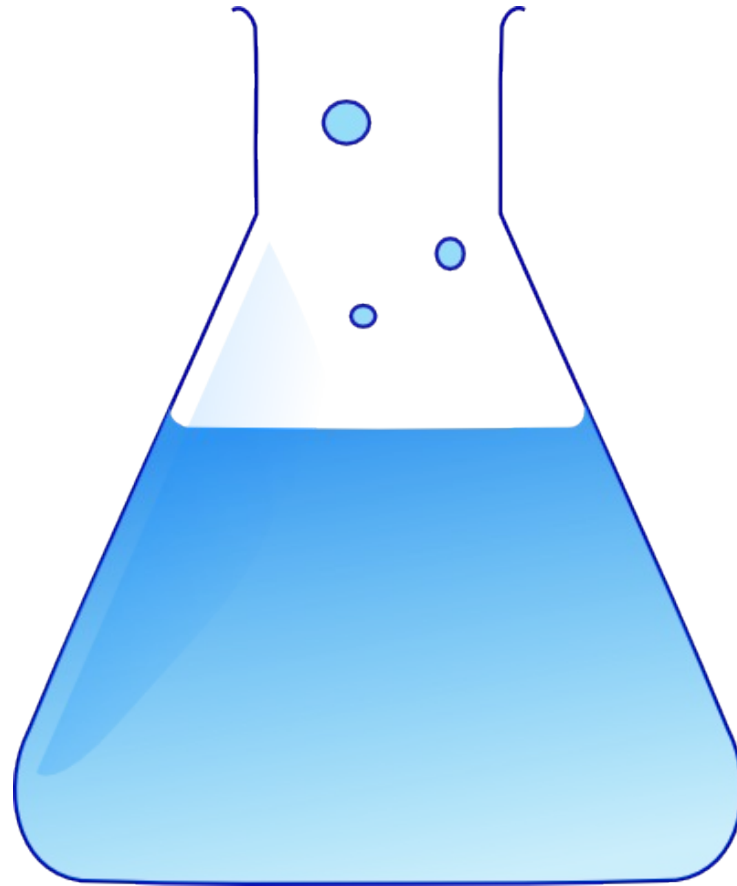
STUDENT
ROBOTICS

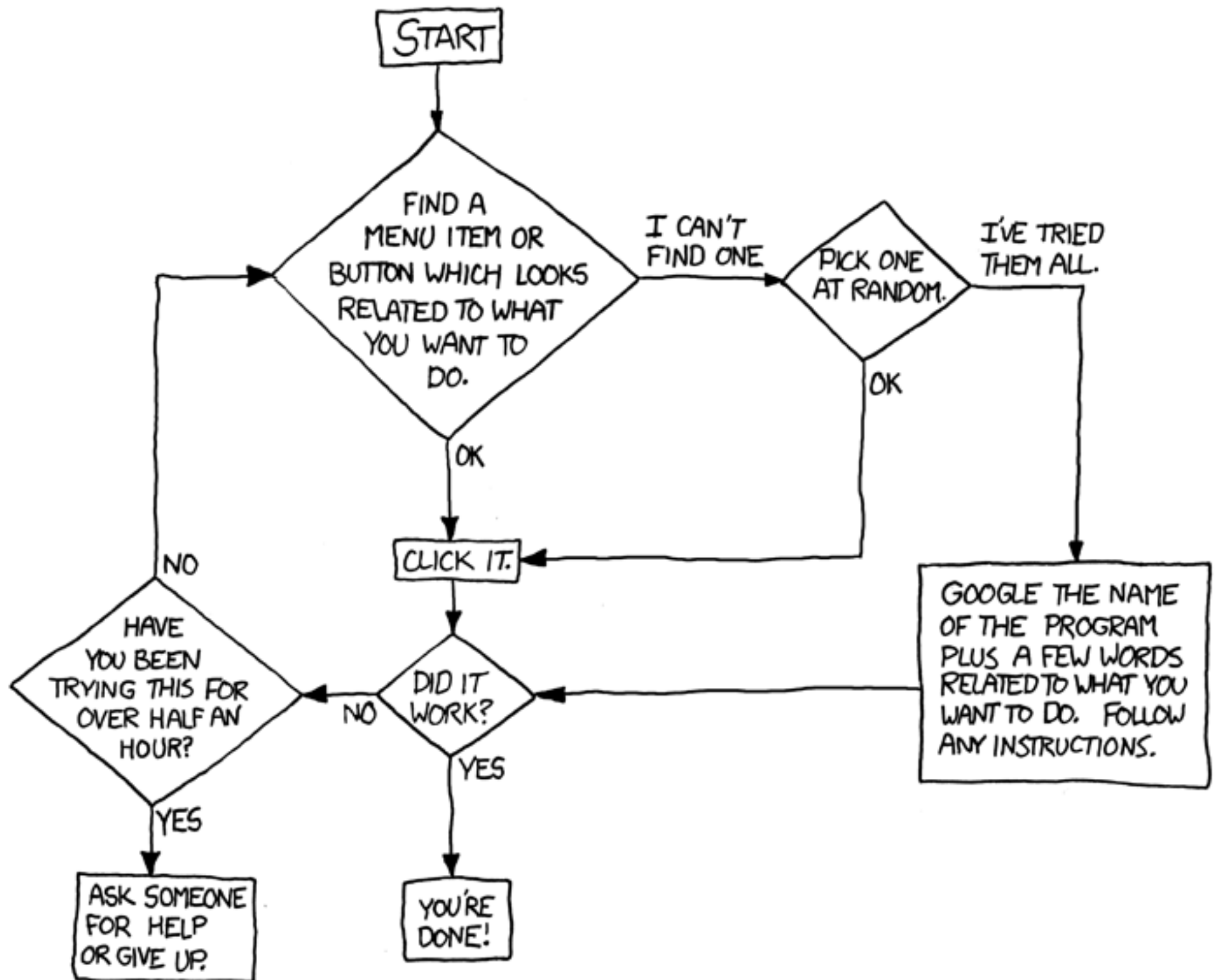
What do you do?



Experiment

STUDENT
ROBOTICS







What if?





Finally

STUDENT
ROBOTICS

Small Steps

