

# From Robot To Robot

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STUDENT ROBOTICS



OTHER  
FOOTPATH

DETOUR







THEIR CRIME IS CURIOSITY

A movie poster for the film 'Hackers'. The background is dark blue. Two women's faces are shown in profile, facing each other. Their faces are covered in glowing, semi-transparent text in various colors (pink, yellow, green). The text includes words like 'LOVE', 'SKILL', 'SECRET', 'GOD', 'TEXT', 'ORDIN', 'ERRIT', 'PHRASE', 'KILL', 'SECRET', 'GOD', 'TEXT', 'ORDIN', 'ERRIT', 'PHRASE', 'KILL', 'SECRET'. The title 'HACKERS' is written in large, bold, white capital letters with a slight glow, positioned below the women's faces. Below the title, there is a line of smaller text: 'BOOT UP OR SHUT UP!'. At the bottom, there is another line of text: 'ON LINE - THIS FALL'.

# HACKERS

BOOT UP OR SHUT UP!

ON LINE - THIS FALL

# Hackers

- Early MIT years
- Homebrew Computer Club
- CCC
- ...

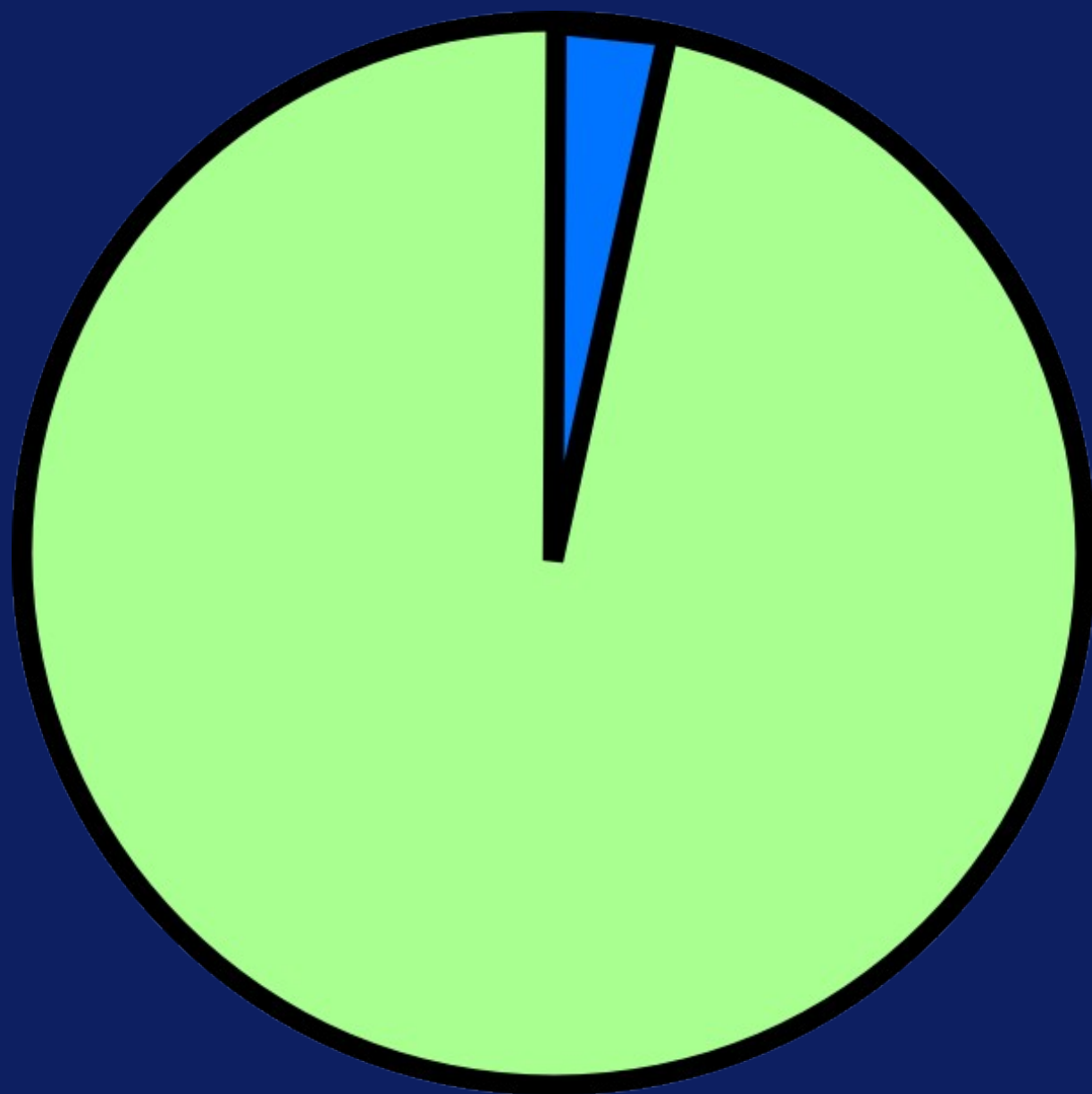
“Hacker”

Hobbyist

Amateur

Hacker





Why do I (we?) want more hackers?

# Why do I (we?) want more hackers?

- Creative people solve problems

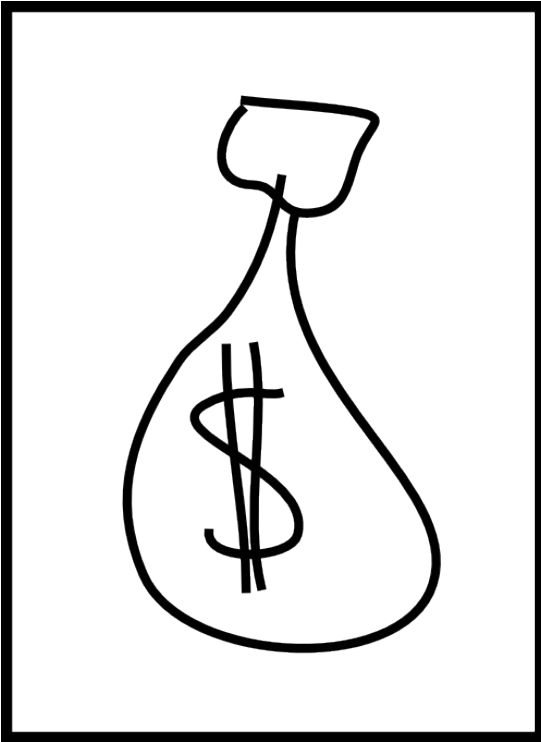


# Why do I (we?) want more hackers?

- Creative people solve problems
- Creative people solve problems **that you didn't even know you had**

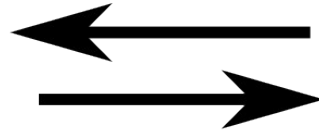
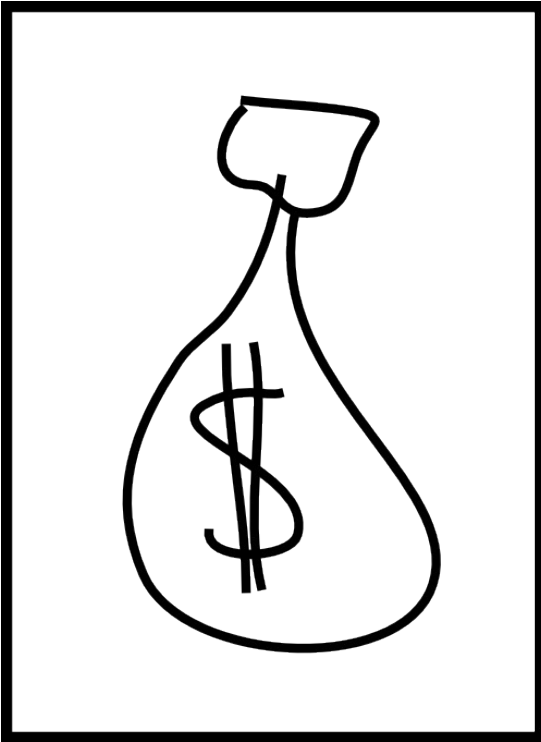


# APIs

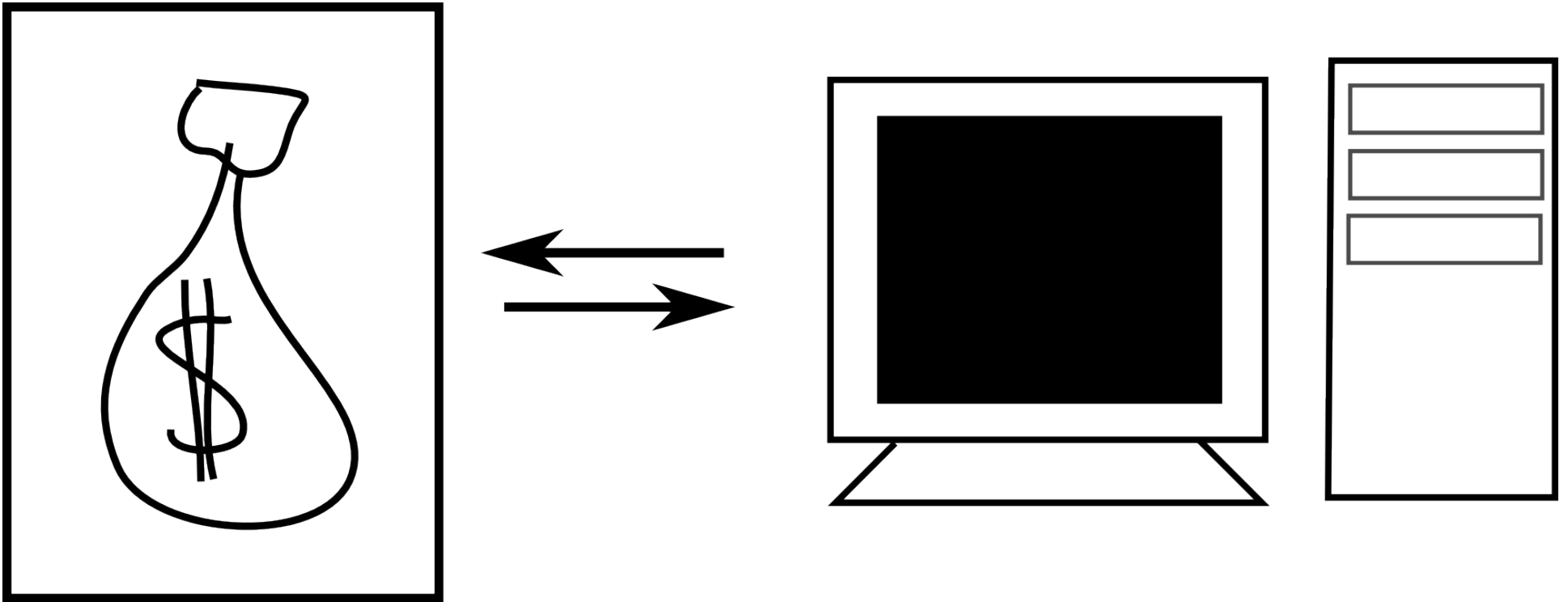




# APIs



# APIs





Diskette Drive B : None  
Pri. Master Disk : LDA,ATA 180, 80GB  
Pri. Slave Disk : DVD,ATA 33  
Sec. Master Disk : None  
Sec. Slave Disk : None

Serial port(s) : 3FB 2FB 3EB 27B  
Parallel Port(s) : 37B 3BC  
DMA at Row(s) : 0 1

Pri. Master Disk HDD S.M.A.R.T. capability .... Enabled

PCI device listing ...

Bus No.	Device No.	Func No.	Vendor/Device Class	Device Class	IRQ
0	2	0	0000 2562	0300 Display Contr	9
0	20	0	0000 24C2	0C03 USB 1.0/1.1 UHCI Contr	9
0	20	1	0000 24C4	0C03 USB 1.0/1.1 UHCI Contr	5
0	20	2	0000 24C7	0C03 USB 1.0/1.1 UHCI Contr	9
0	20	7	0000 24C0	0C03 USB 2.0 EHCI Contr	12
0	31	1	0000 24C0	0101 IDE Contr	14
0	31	3	0000 24C3	0C05 SMBus Contr	NA
0	31	5	0000 24C5	0401 Multimedia Device	5
1	0	0	0000 1030	0200 Network Contr	12
				ACPI Controller	9

Verifying DMI Pool Data .....  
BOARD DIAGNOSTICS ....



## MIT Proverbial Wallet

<http://eco.media.mit.edu/static/proverbialwallets/index.html>

*MIT Proverbial Wallet photos*

© *John Kestner*











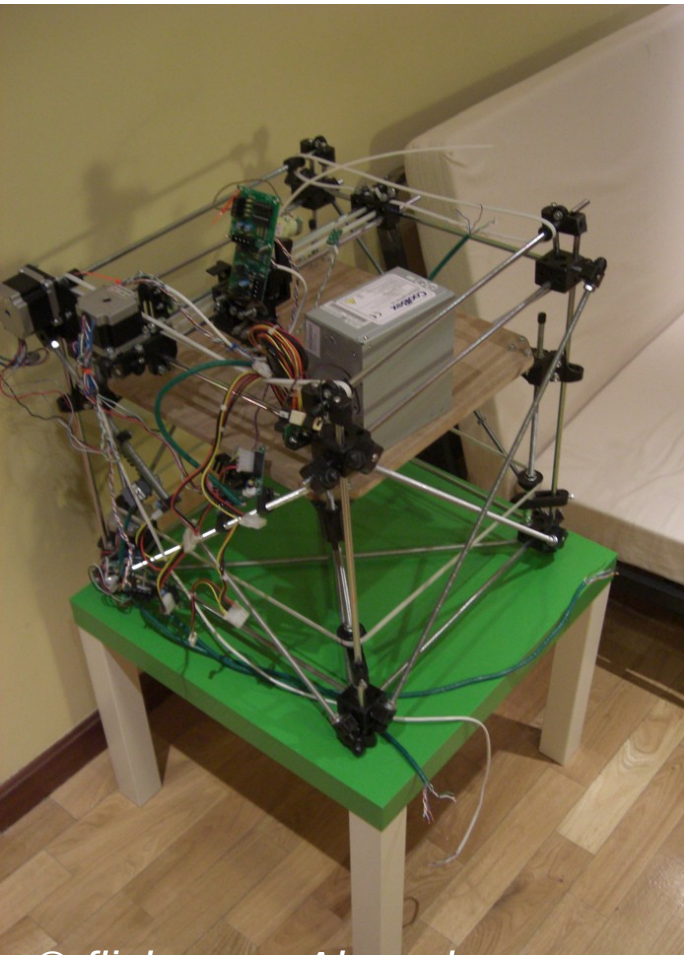


# Recap

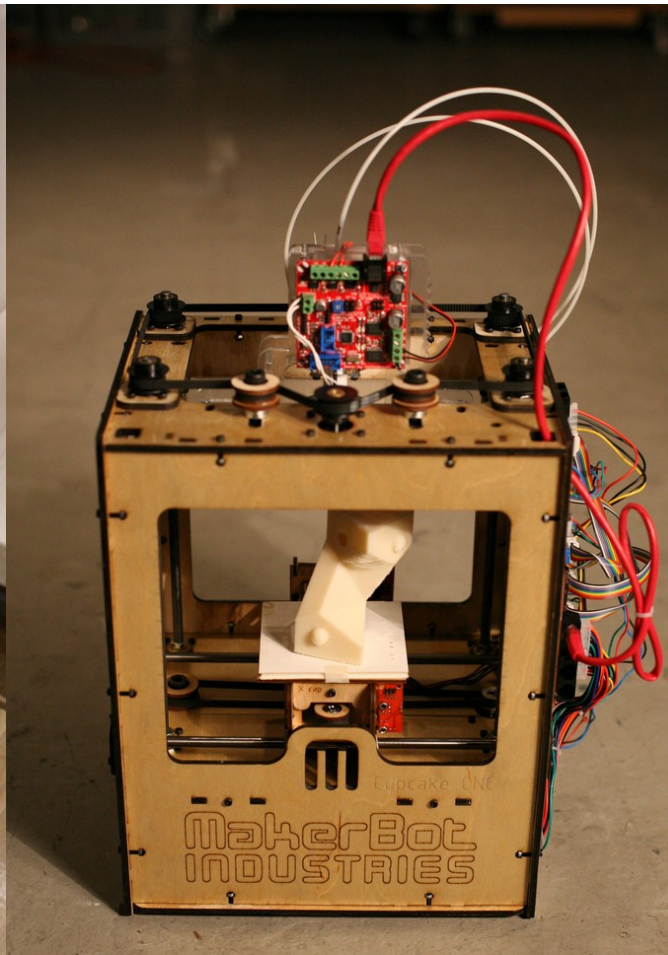
- There aren't enough hackers around
- More things should be hackable

# Why the lack of hackers?

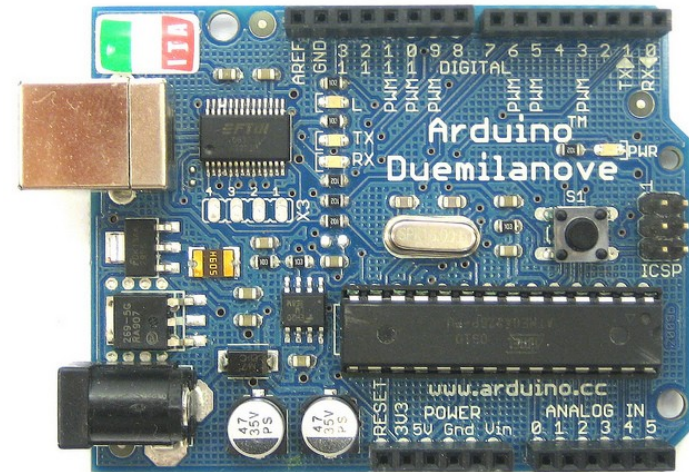
- Access to Resources?



© flickr user Alx cc by-nc-sa



© flickr user Alx cc by-nc



© flickr user Alx cc by

Still something missing...

Education



## Ken Robinson:

*“I believe passionately that we are all born with tremendous natural capacities, and that we lose touch with many of them as we spend time in the world. Ironically, one of the main reasons this happens is education.”*

(from his book “The Element: How Finding Your Passion Changes Everything”)



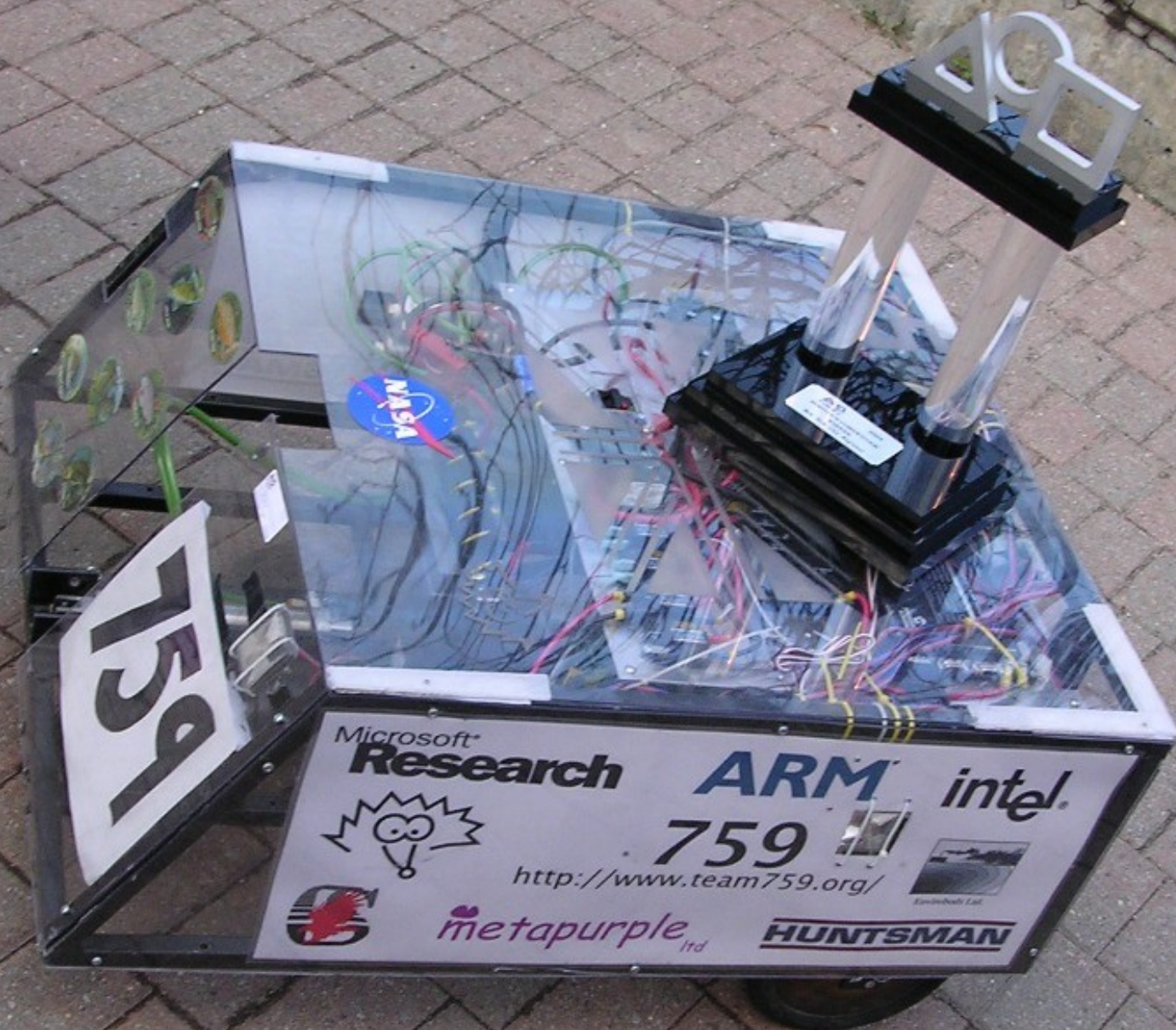
**Cambridge**



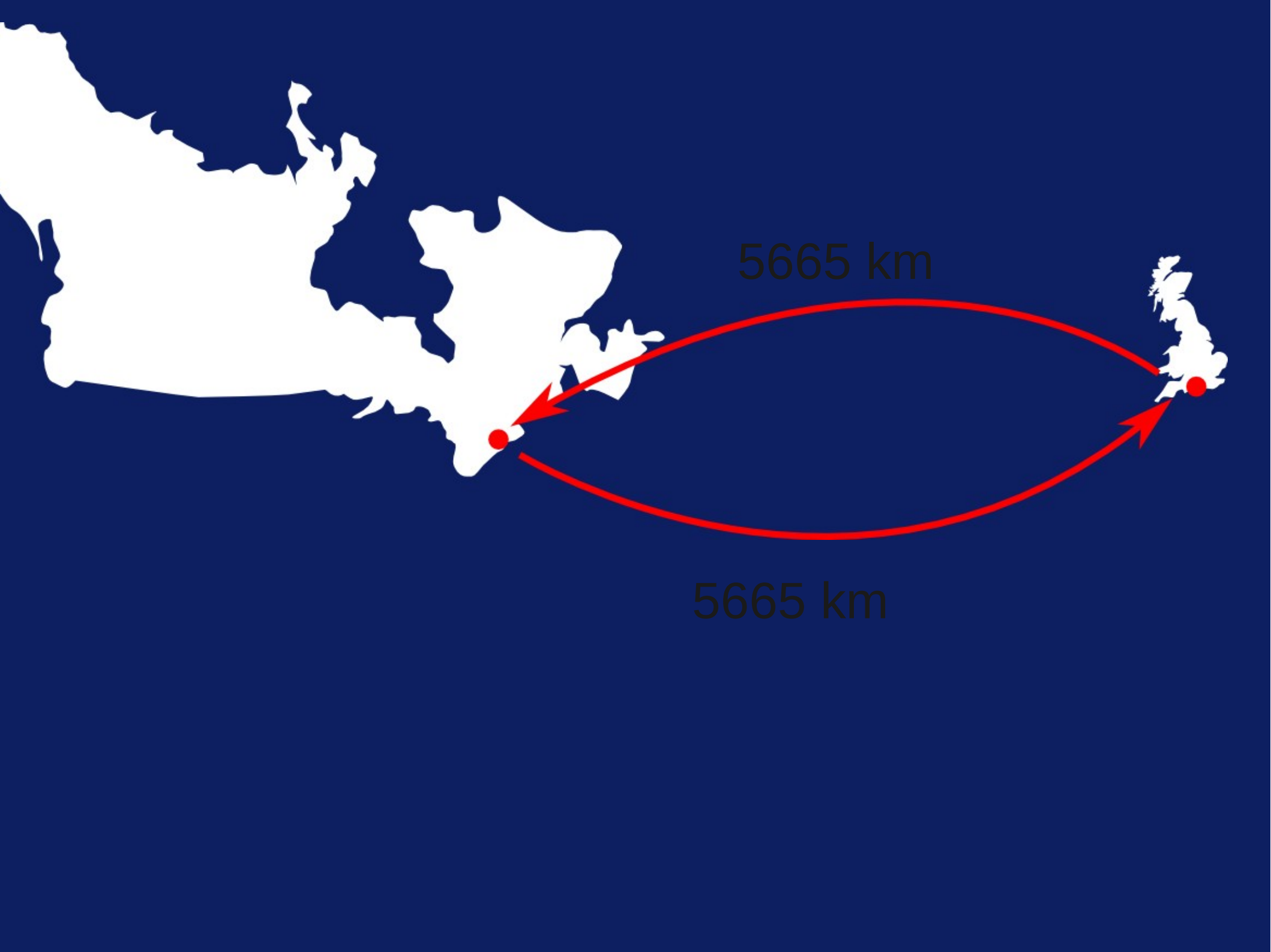
[www.usfirst.org](http://www.usfirst.org)











5665 km

5665 km

# It was good, but...

- 6 weeks to build
  - Collides with exams
- **Expensive**

# Can we do better?

- Robotics Competition
- Cheap
- Autonomous
- More time





STUDENT ROBOTICS

Money...



motorola  
foundation

UNIVERSITY OF  
**Southampton**

School of Electronics  
and Computer Science



Sixth Formers == 16-18 Year olds













+4 Years

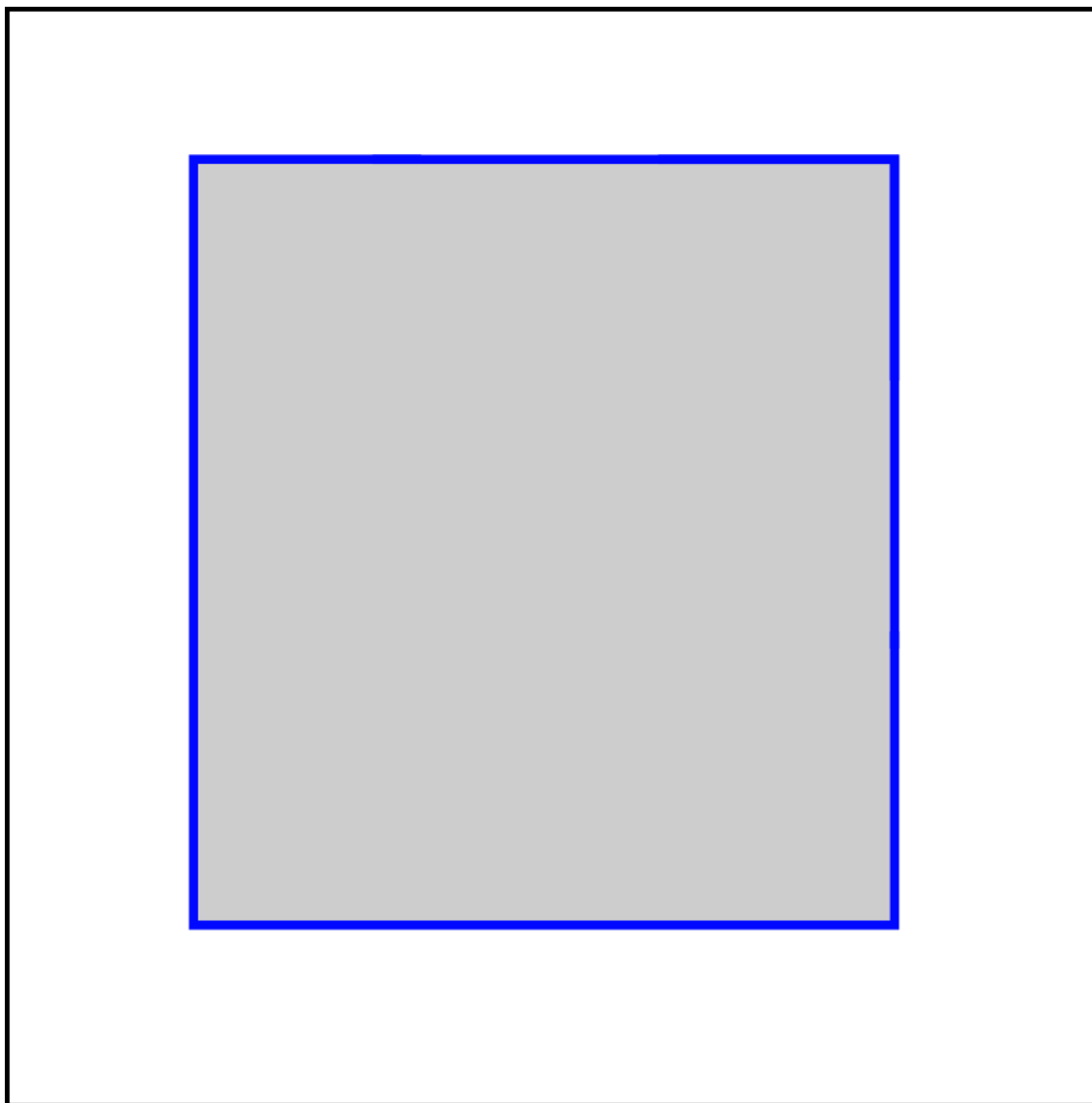
18 Teams

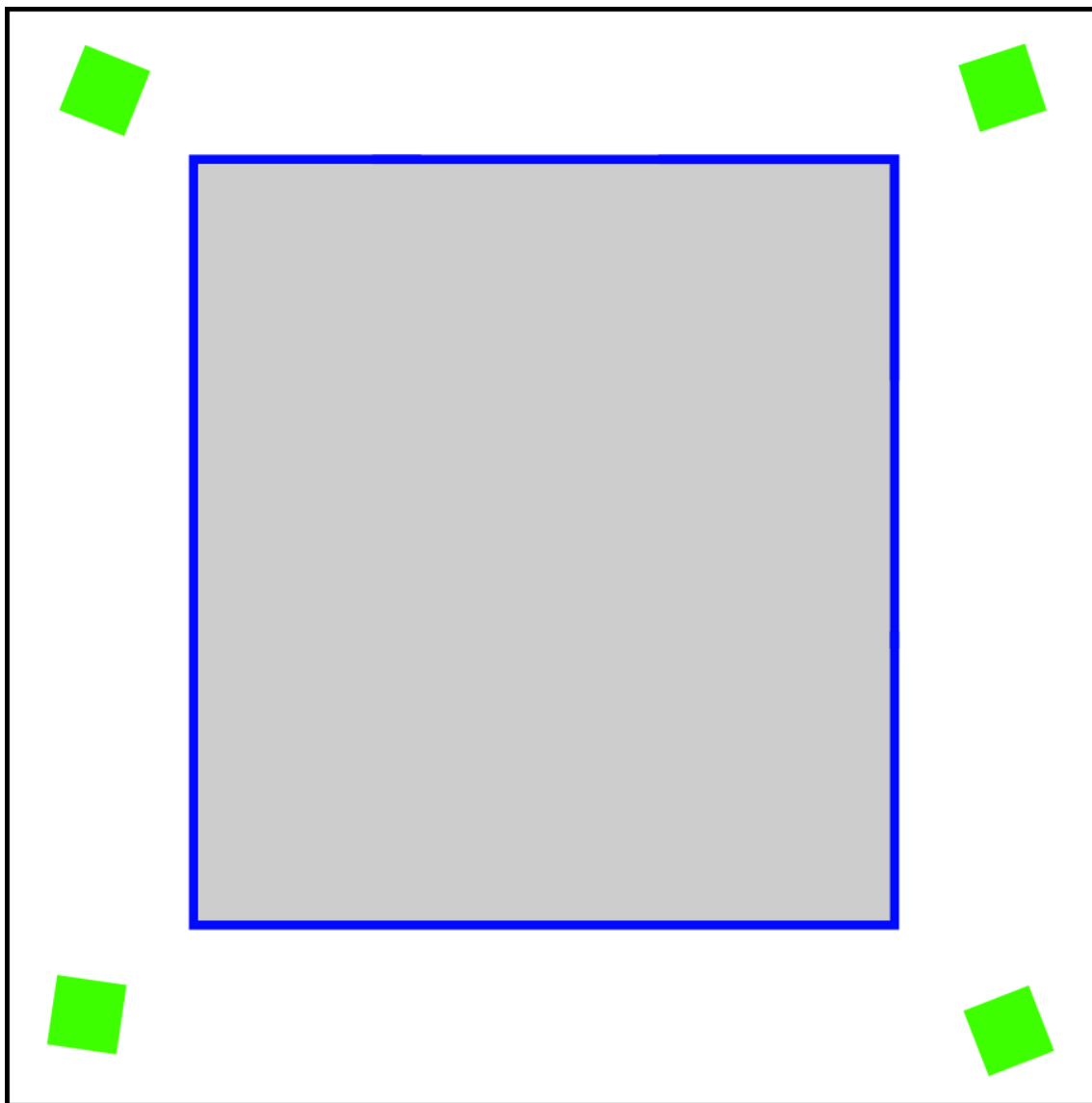
151 Sixth-Formers



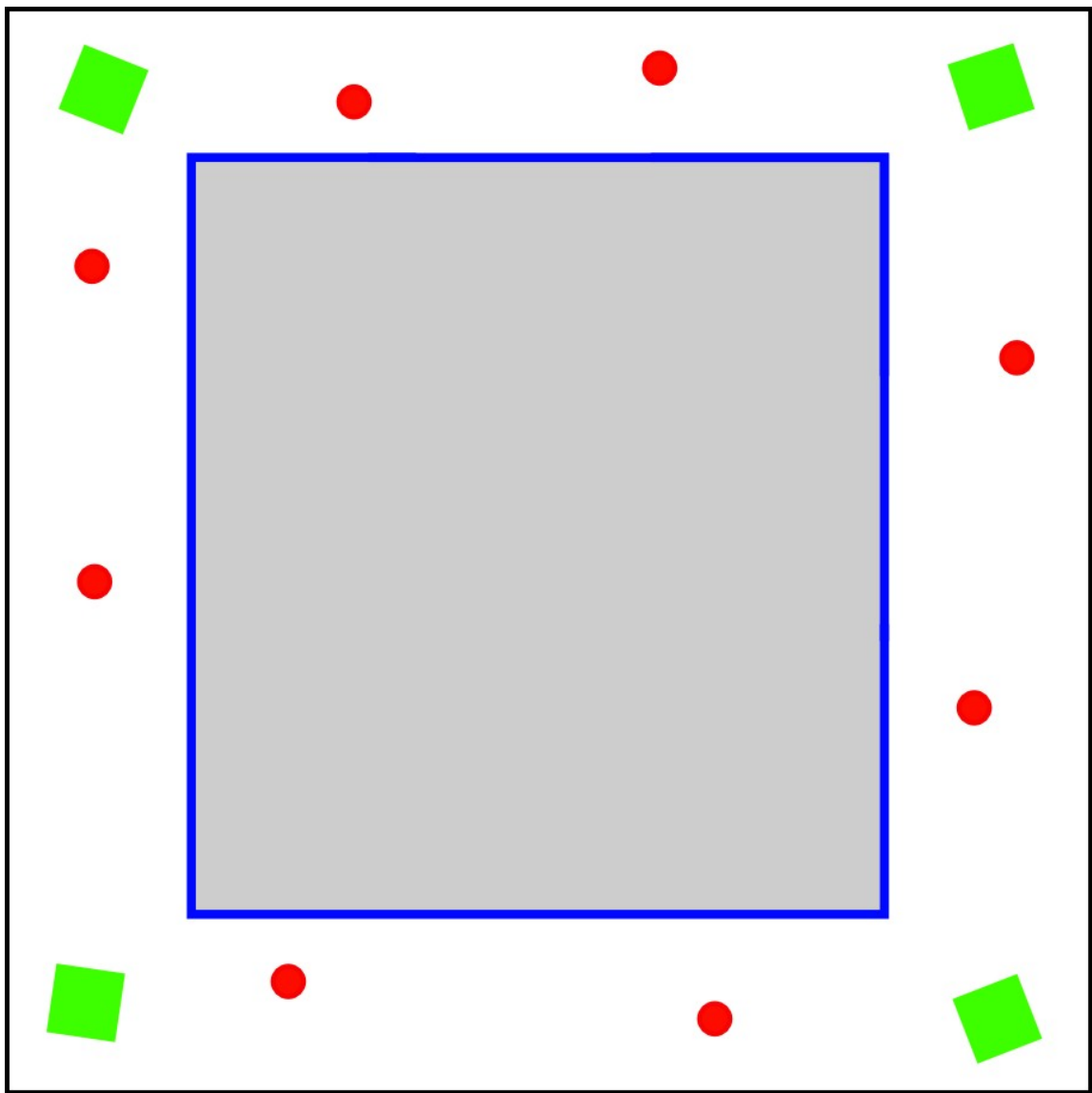


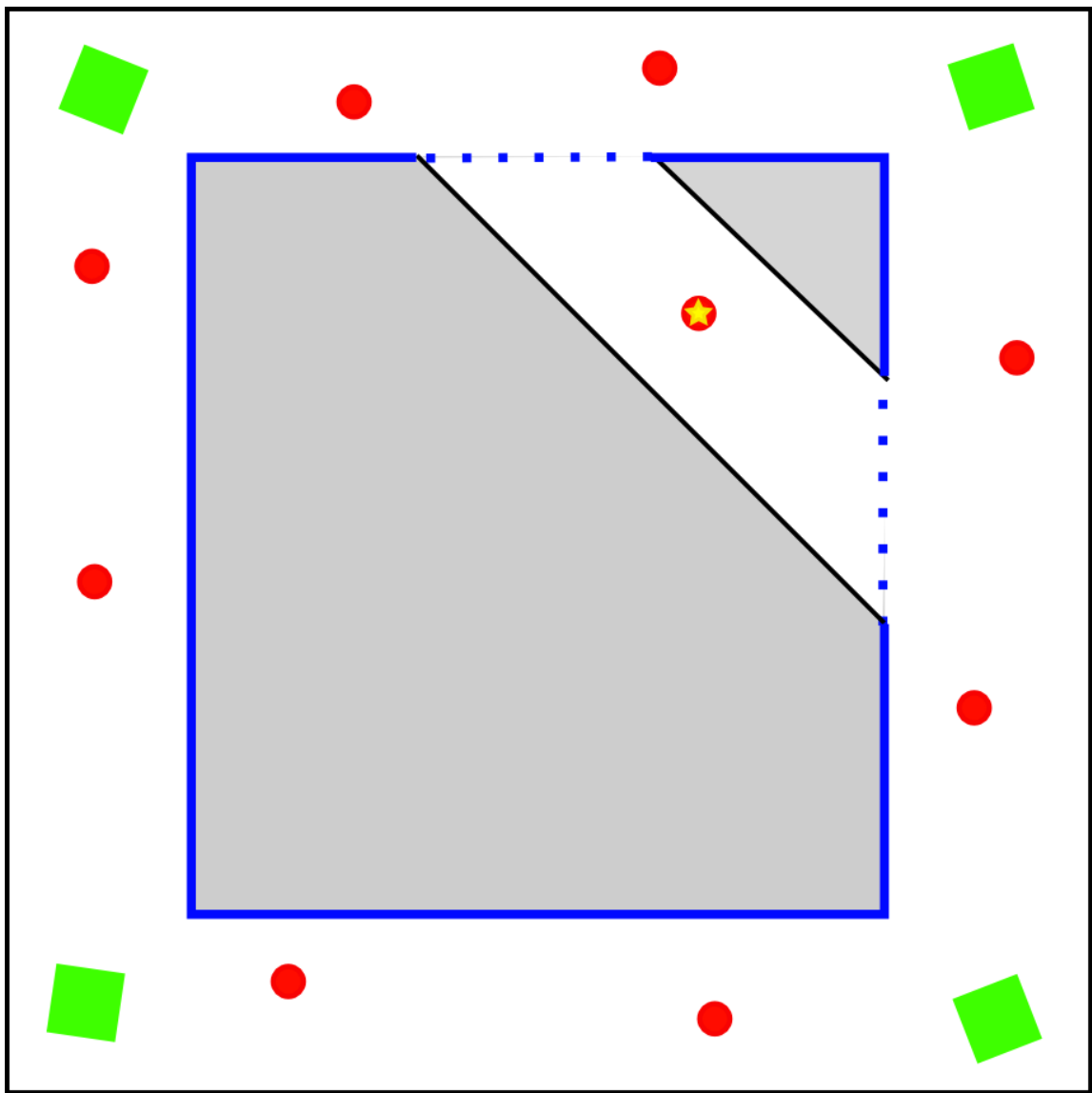


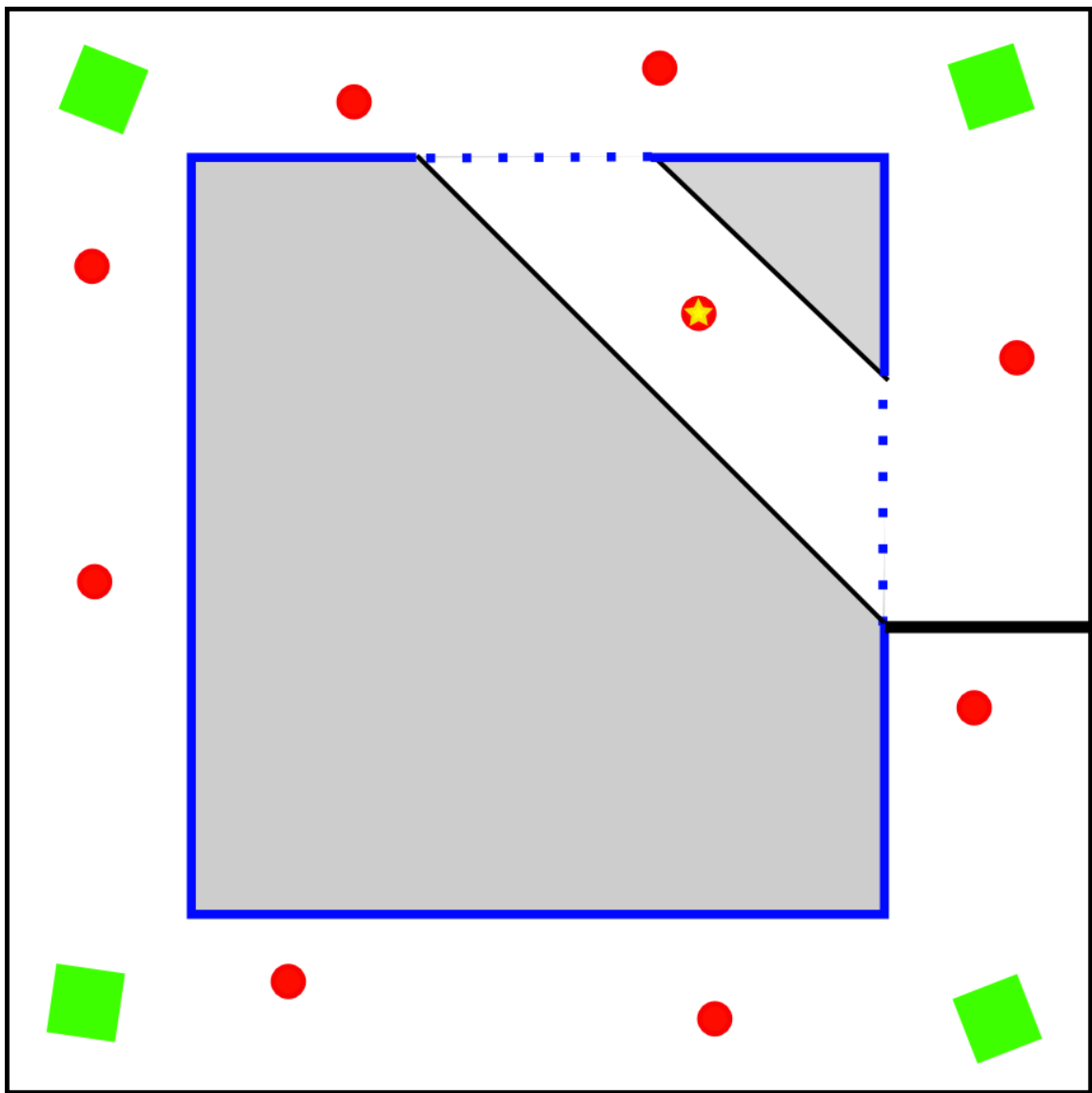












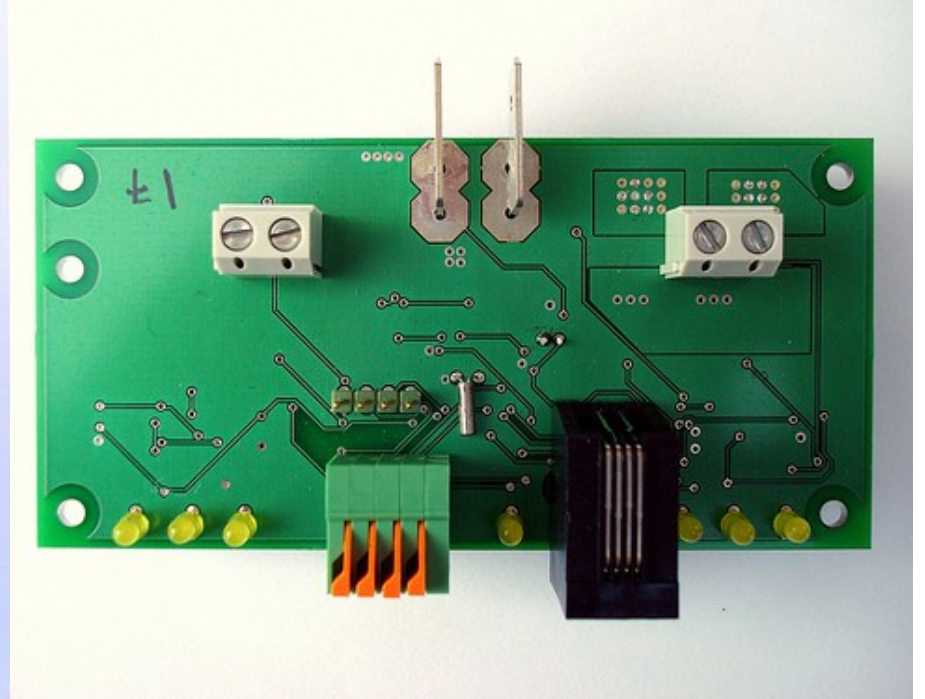
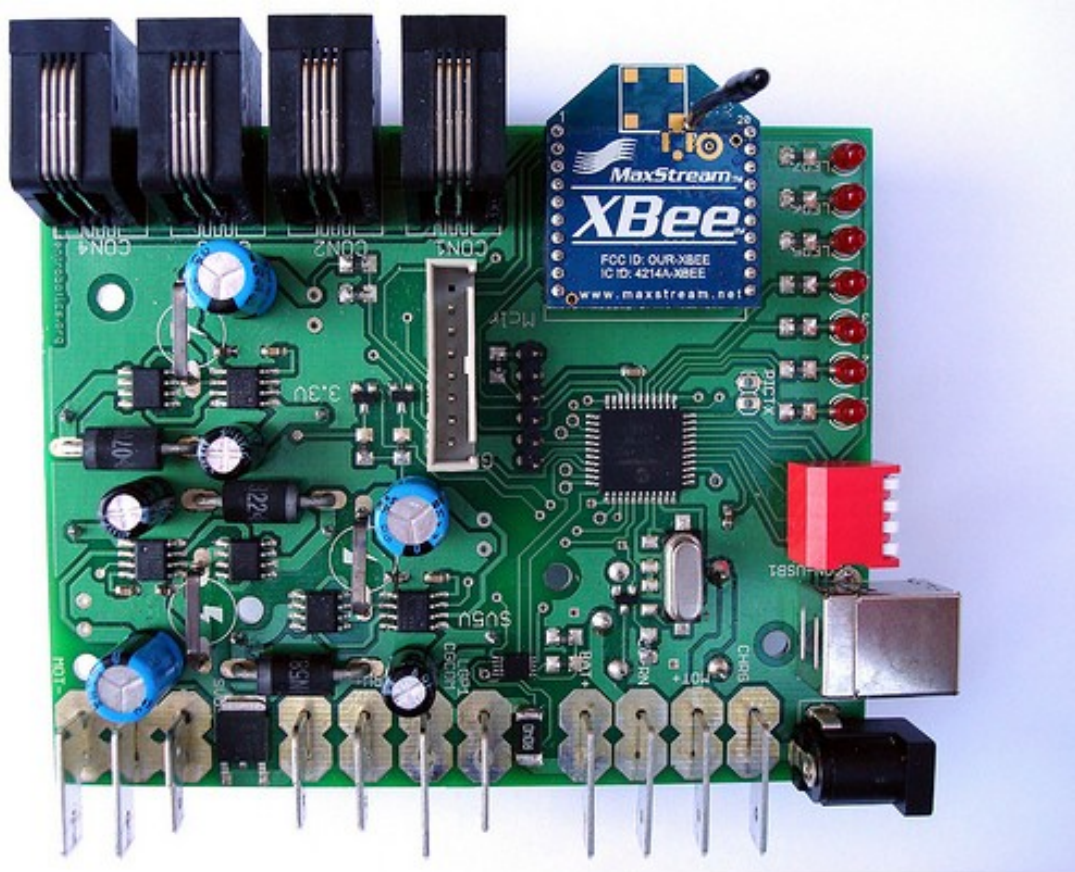
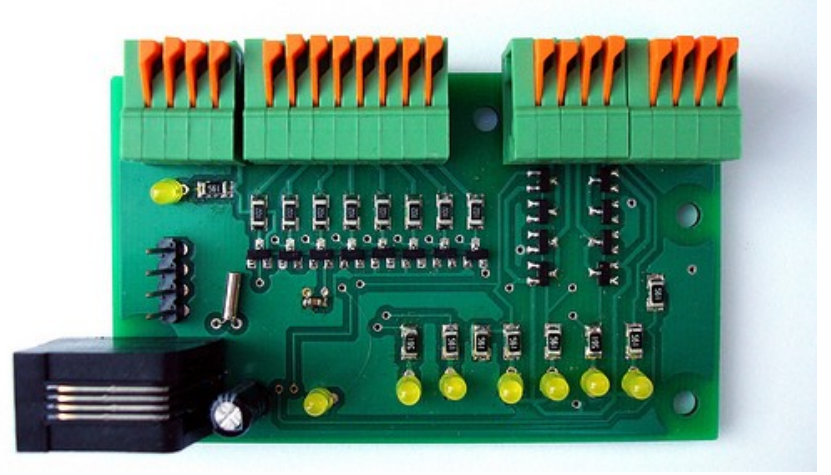
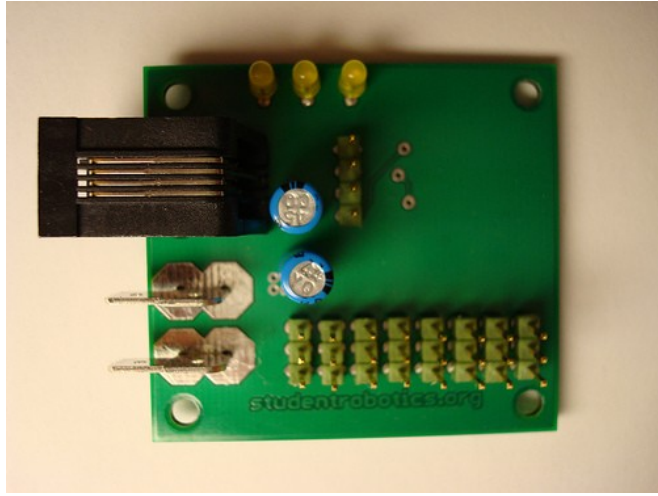
# We give teams:

- Hardware
- Software
- Guidance

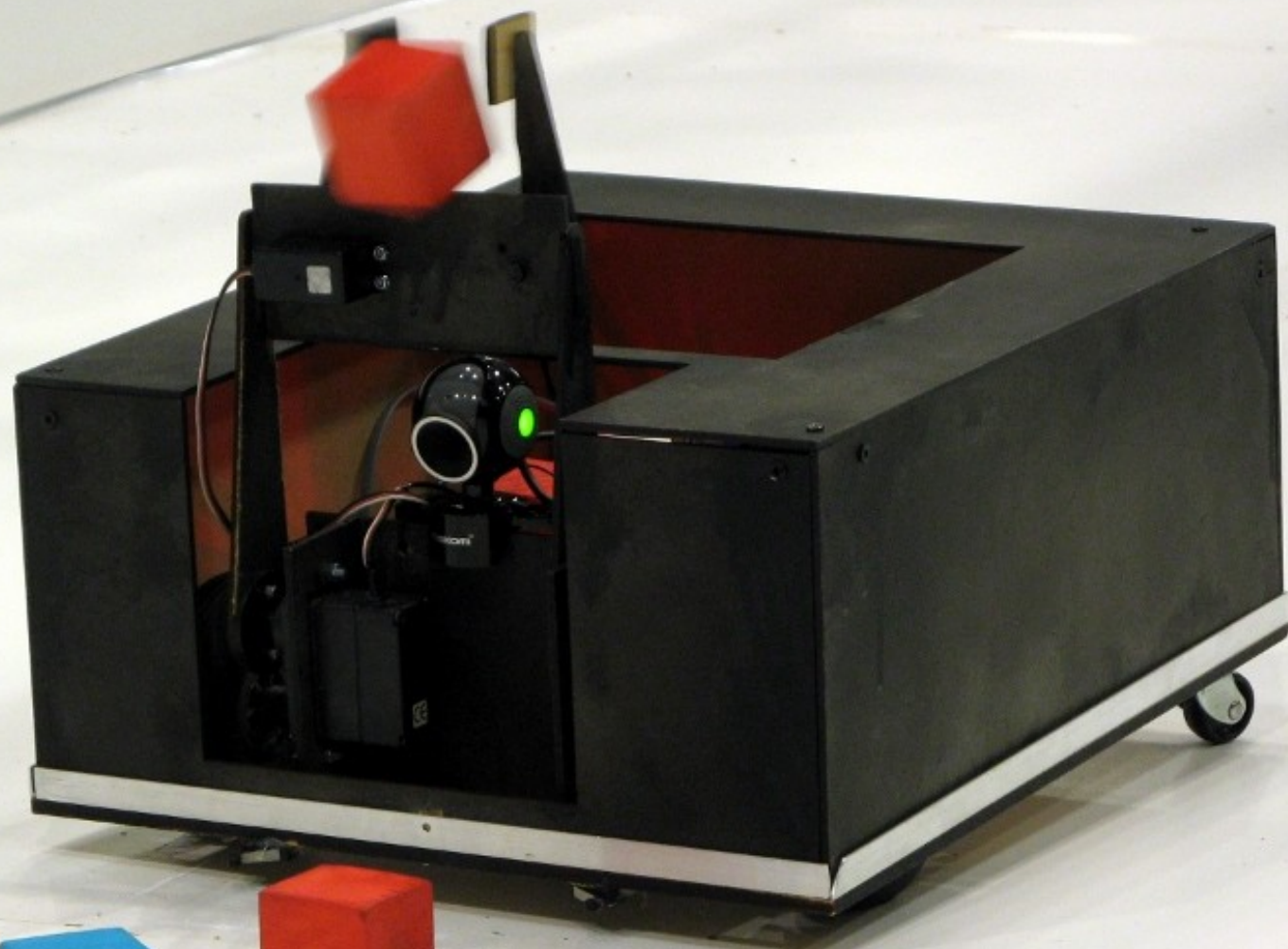




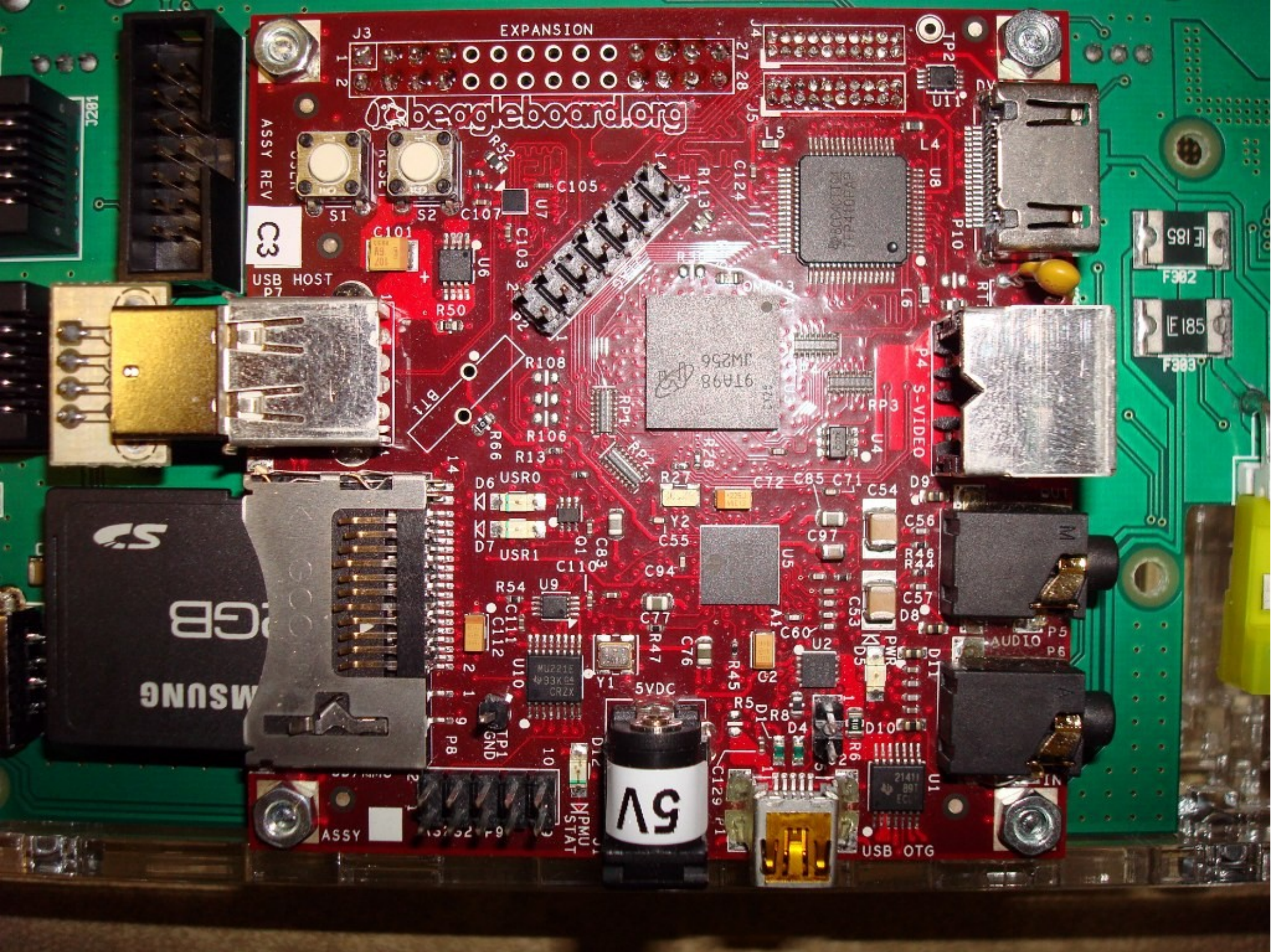














# BeagleBoard

- Open Hardware
- TI OMAP Chip
  - 720MHz ARM A8 Core
  - 256 MB RAM
  - 256 MB Flash
- USB Host, USB OTG
- Video Bus
- \$149



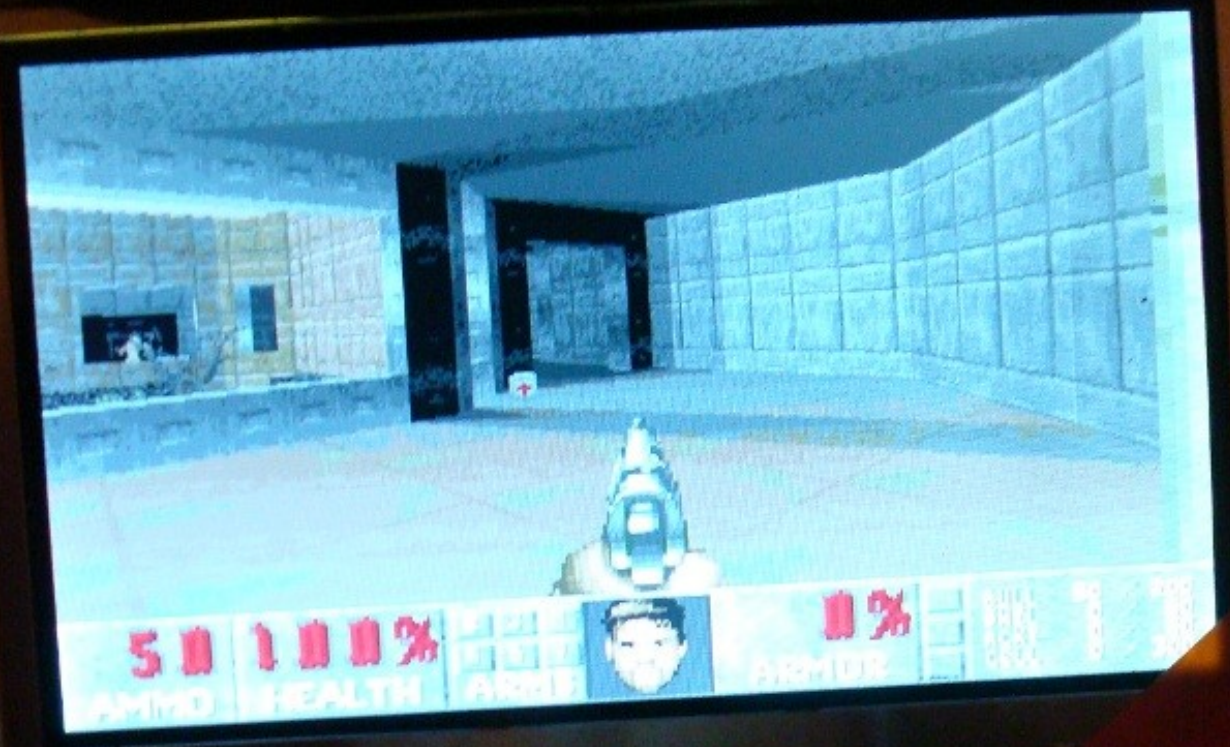








NOKIA  
CEC  
WARRANTY

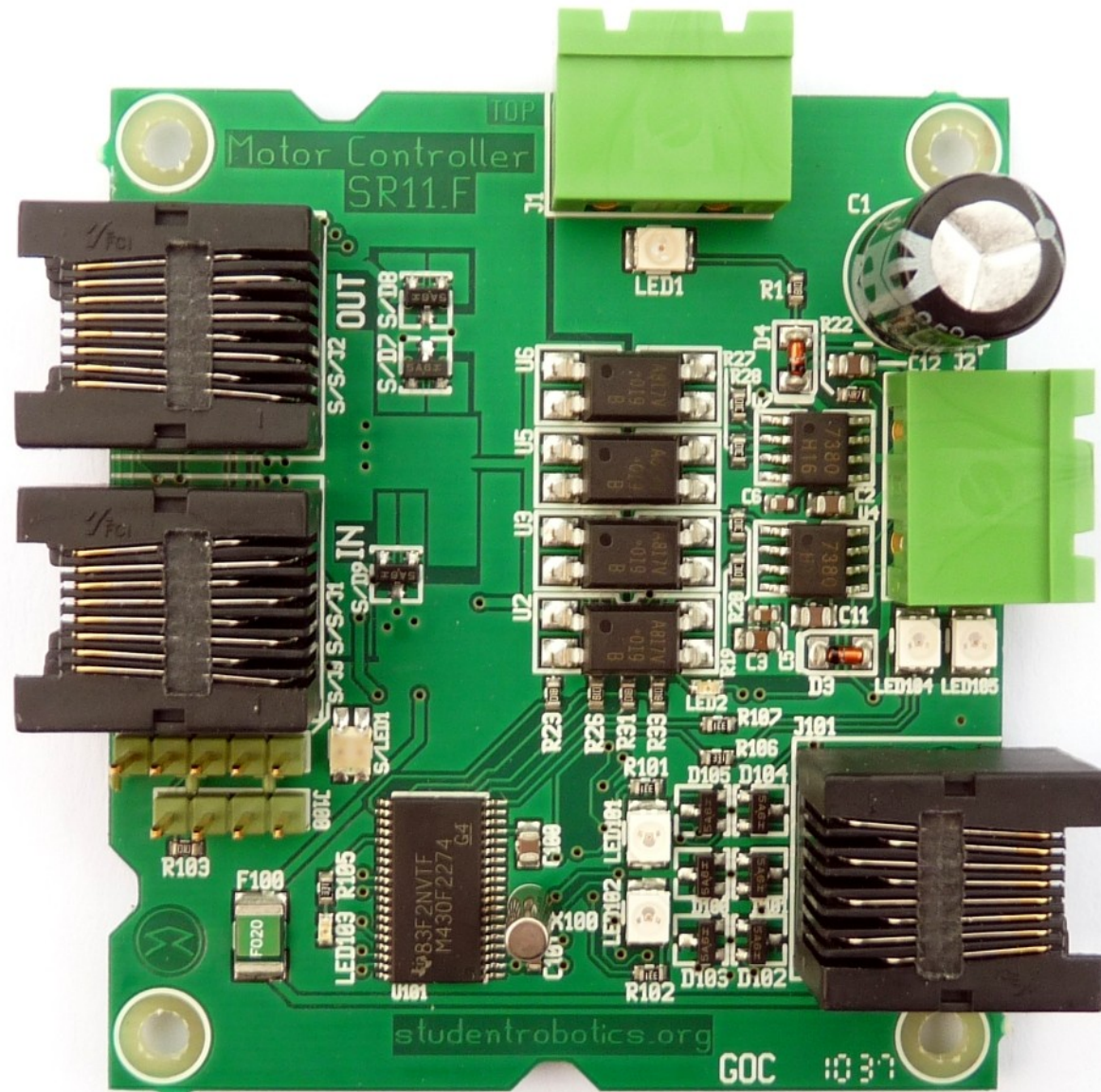


SHARP





# Motor Controller

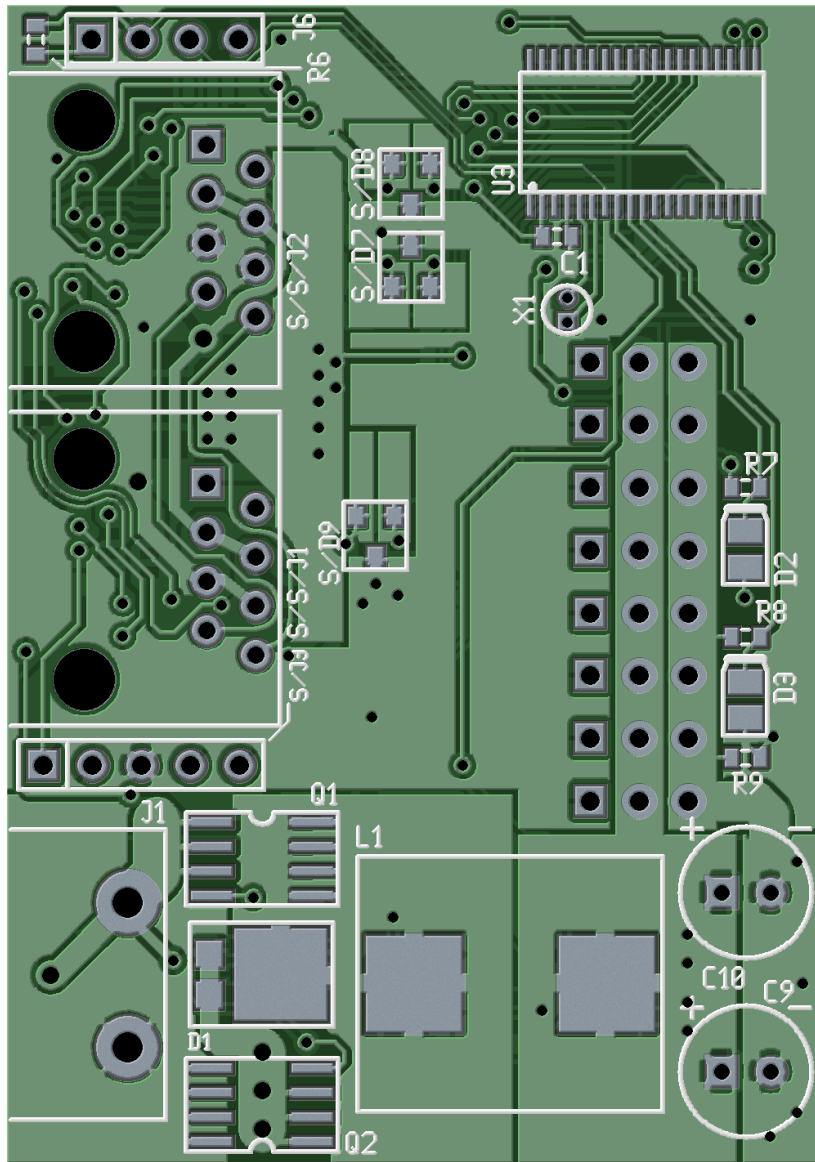
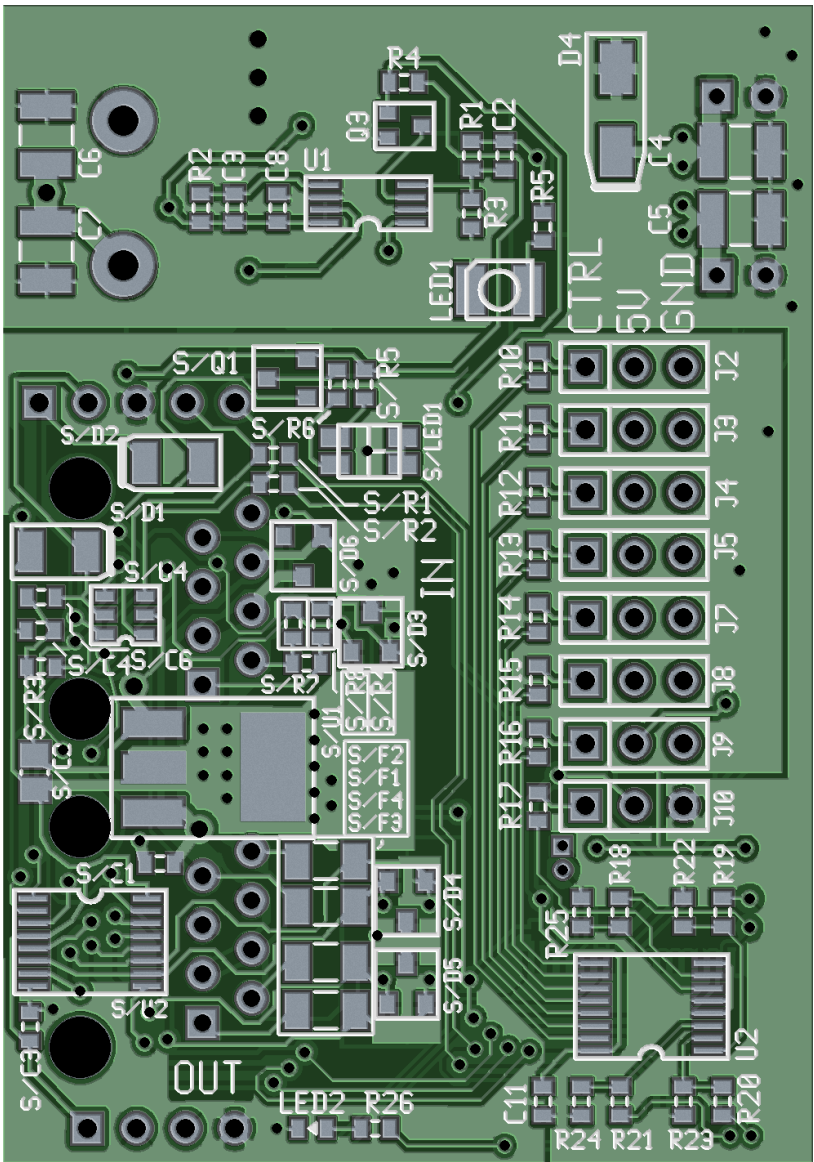






The "JointIO" Board

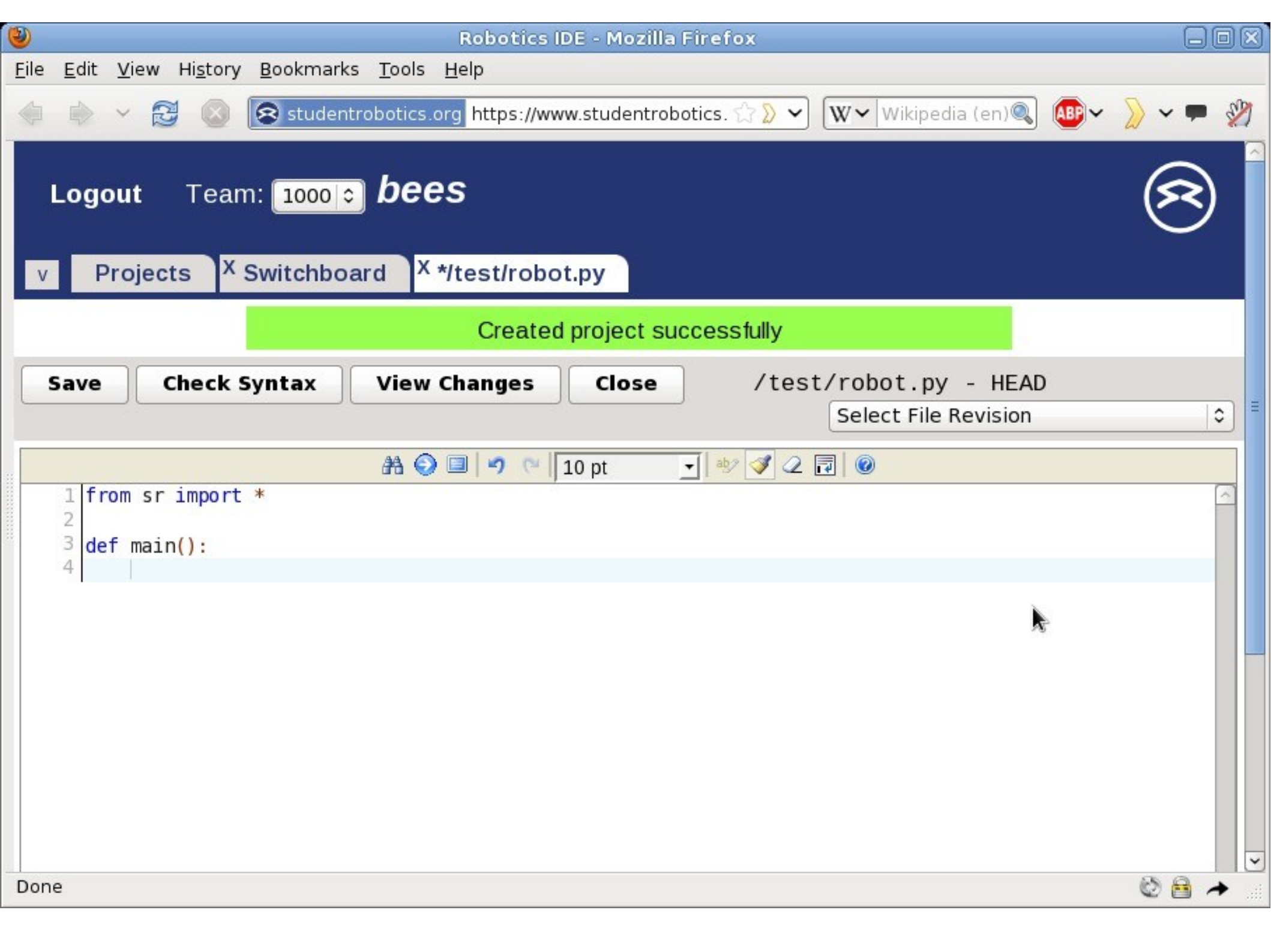






# Programming

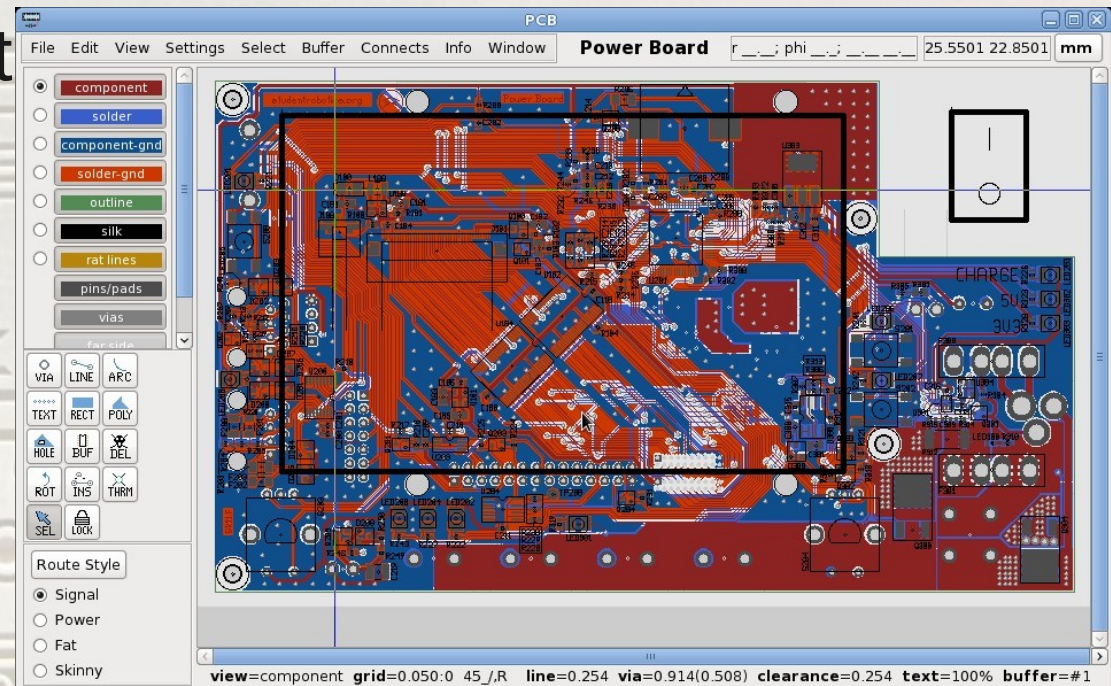
- Python
- USB-key based





# Open Design

- gschem
- PCB
- Automated BOM system
  - HTML placement data
- QCAD
- <http://git.srobo.org/>



LLVM Compiler Backend for tic64x DSP

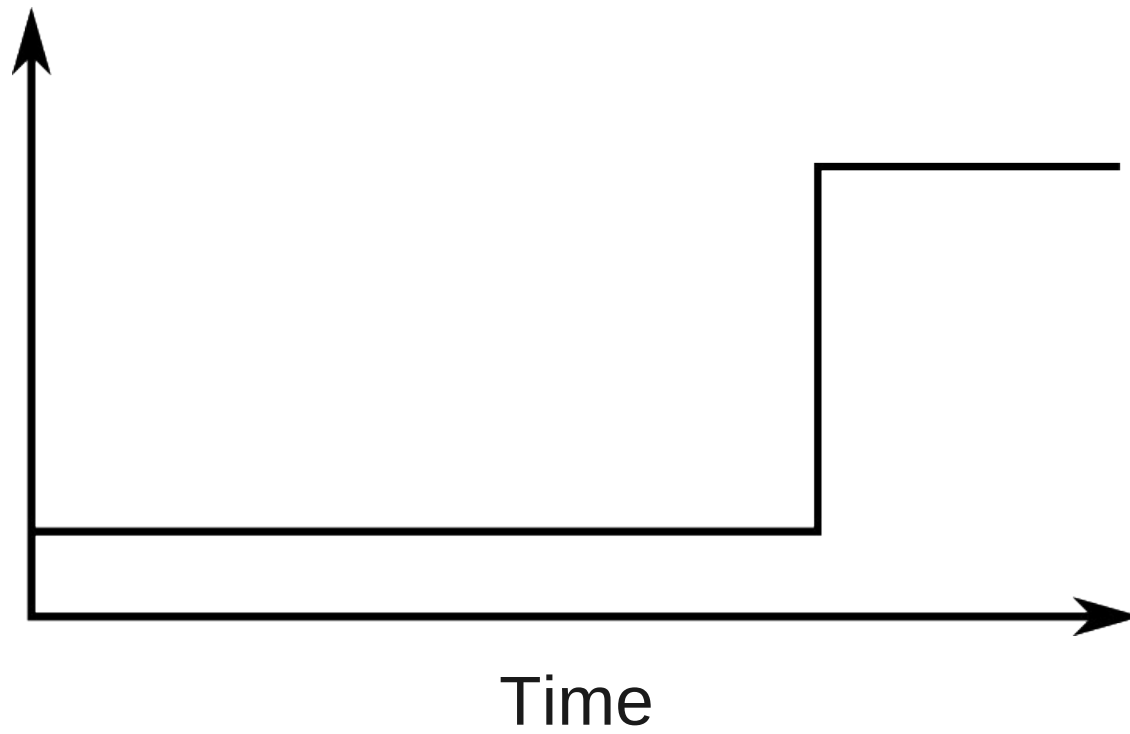
[http://srobo.org/trac/wiki/Beagleboard\\_DSP](http://srobo.org/trac/wiki/Beagleboard_DSP)

# Meetings

~~Meetings~~



Doings







# Want to get involved?

- Kit hacking
- Mentor a team
- Start a branch

- Adrian Pelling
- Alex Forward
- Alexis Johnson
- Alistair Lynn
- Andrew Busse
- Aron Kisdi
- Chris Cross
- Chris Kirkham
- Chris Malton
- Franz Florack
- George Payne
- Howard Buck
- Jake Sanders
- Jeff Gough

- Jeremy Morse
- Jo Sun
- Justyn Butler
- Nick Greatbatch
- Peter Law
- Phil Smith
- Richard Barlow
- Sam Phippen
- Stephen English
- Thomas Scarsbrook
- Tobias Kleemann
- Tom Bennellick
- Tom Smith

# Thanks for listening

Student Robotics: [www.studentrobotics.org](http://www.studentrobotics.org)

[rspanton@zepler.net](mailto:rspanton@zepler.net)  
[xgoat.com](http://xgoat.com)

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