Java with Raspberry Pi

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Java Scale

Raspberry Pi Coffee


DEVNEXUS
LTD
1986
BATDORF & BRONSON
COFFEE ROASTERS


TUBES
TIME
COFFEE OF DOOM
I SEE
YOU

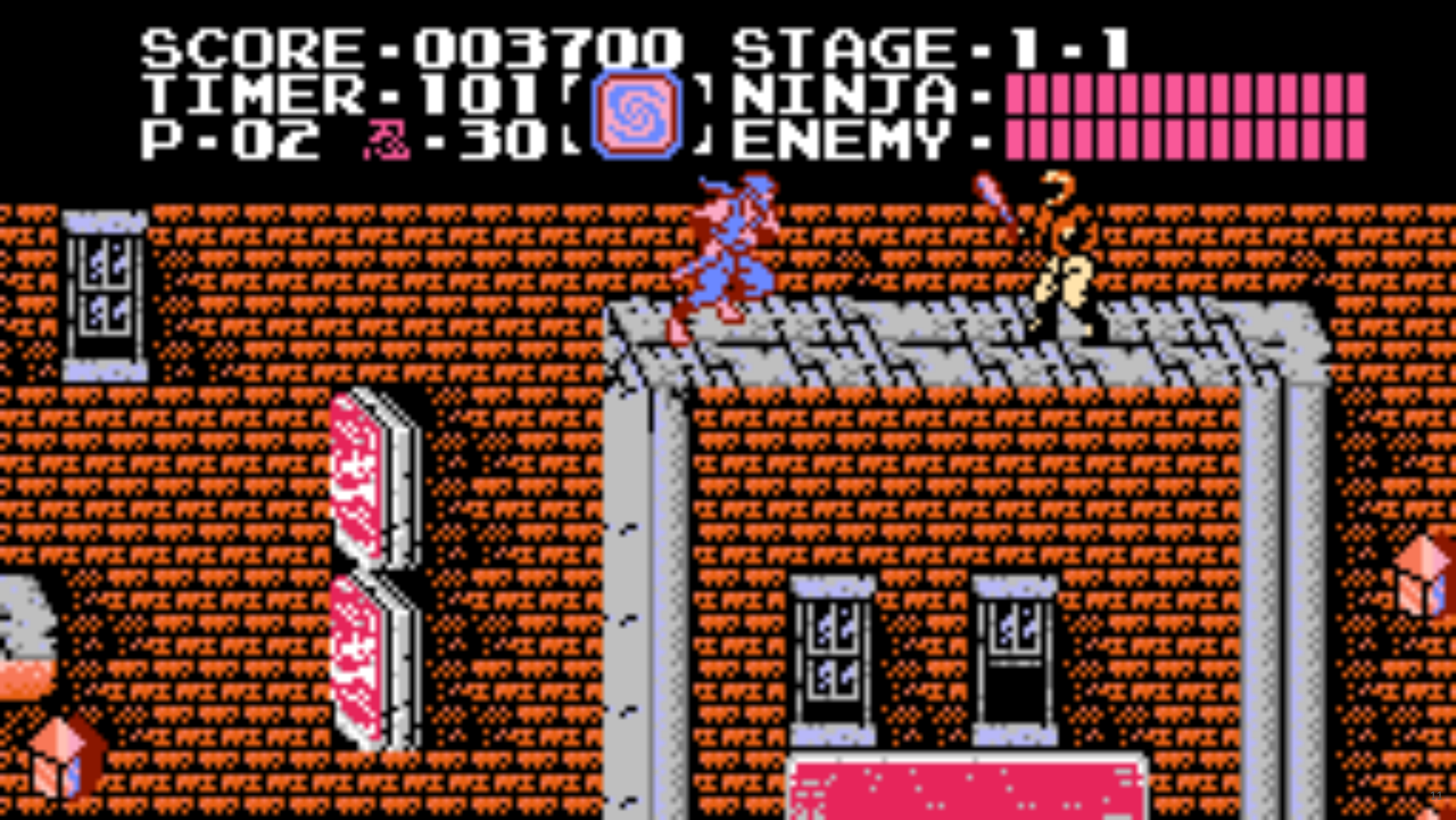

BRUTE
EVNEXUS

Driving Test

https://www.flickr.com/photos/davidyuweb/1352312273


Nintendo


1
01' 26" 06

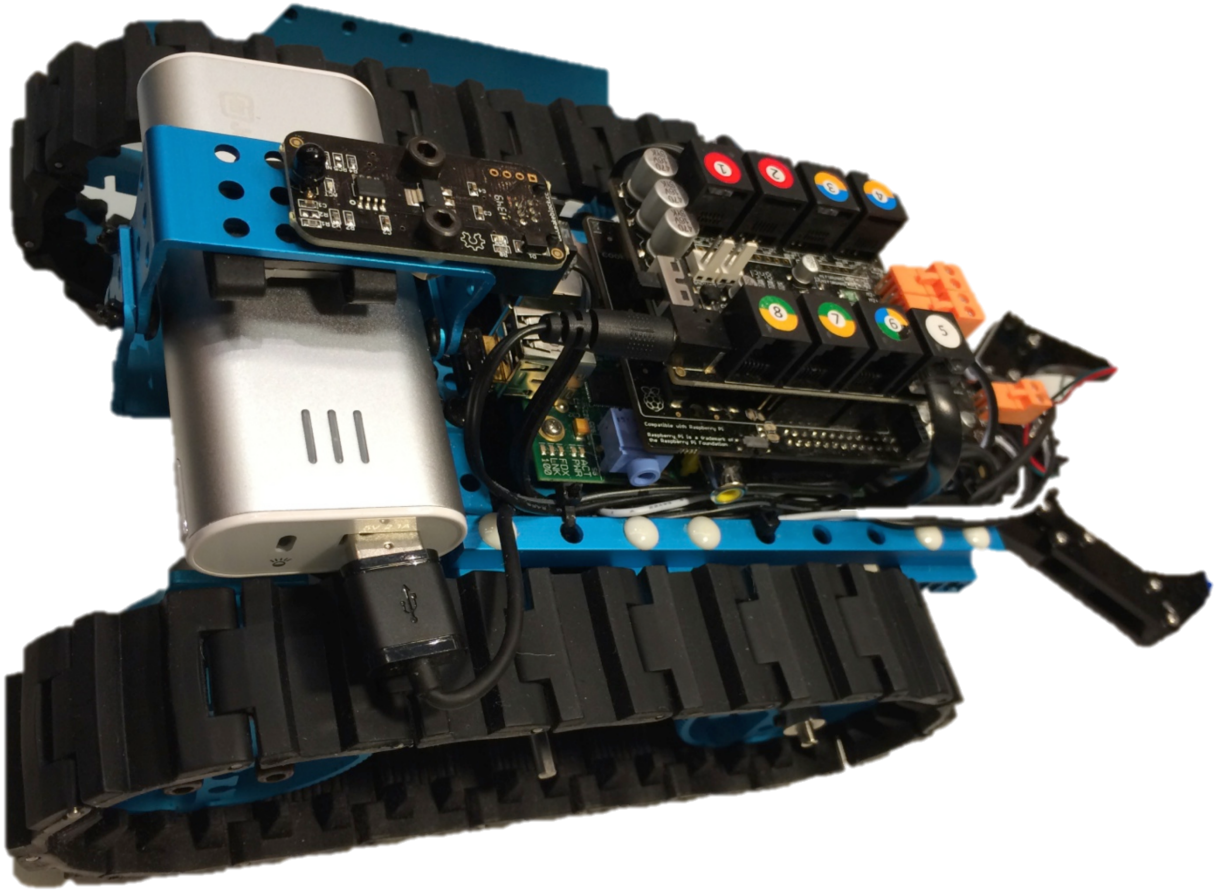

SCORE-003700
STAGE-1-1
TIMER-101
NINJA-
P-02
忍-30
ENEMY-

Up-Up-Down-Down-Left-Right-Left-Right B, A, Start

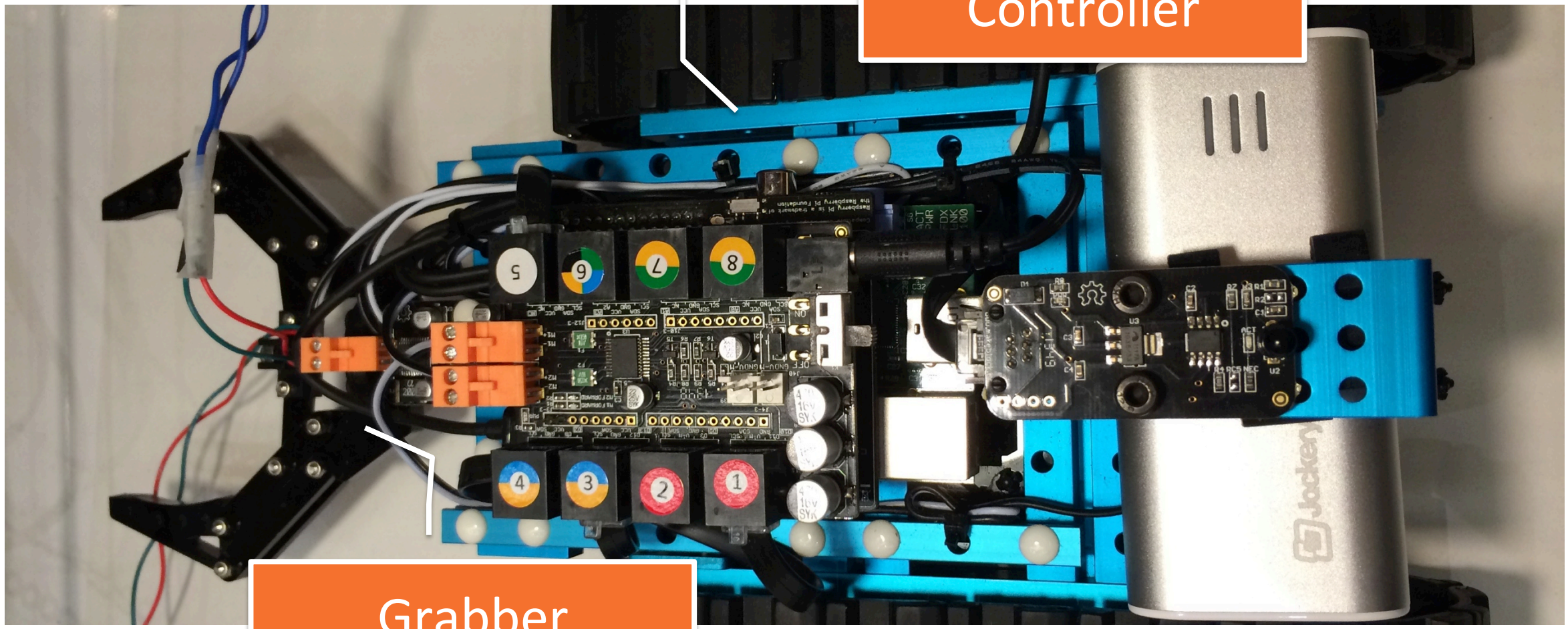
Meet Mr. Grabby

https://www.flickr.com/photos/pasukaru76/8278458818/
https://www.flickr.com/photos/fallentomato/5656700432/

Meet Mr. Grabby

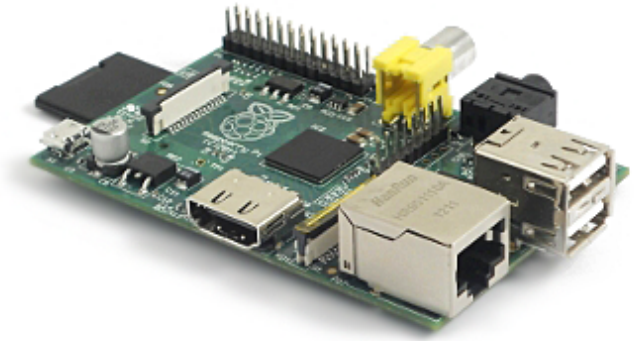


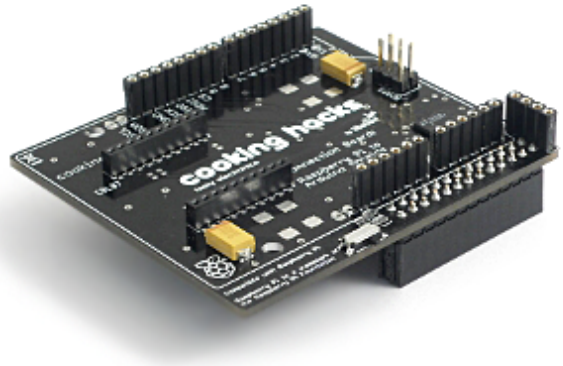
Mr. Grabby's Back

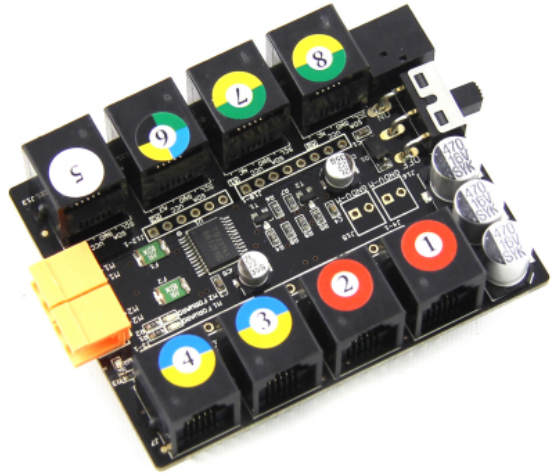


Controller

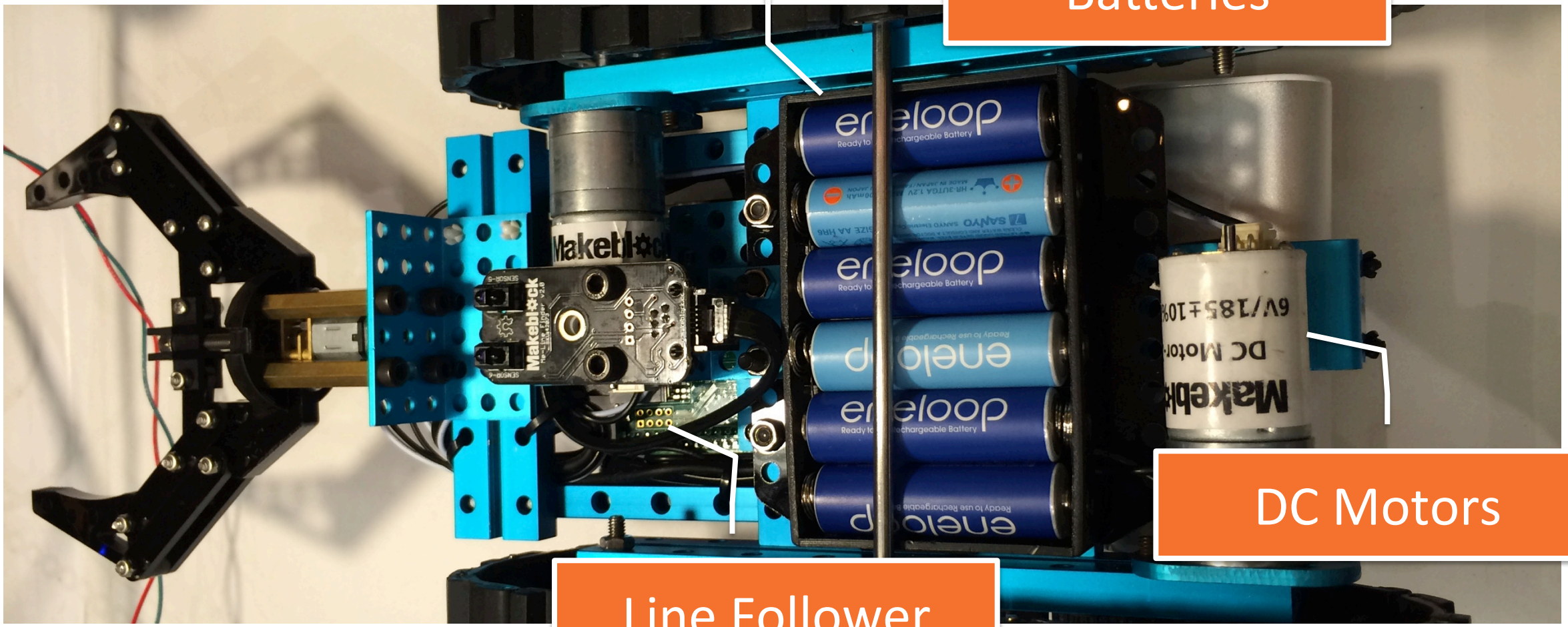
- Raspberry Pi
- Cooking Hacks Shield
- MakeBlocks ME Base Shield







Mr. Grabby's Belly



How Line Followers Work

- Infrared LED
  - Bounced light off the ground
- Infrared Luminosity Sensor
  - Detects reflected light

Getting GPIO

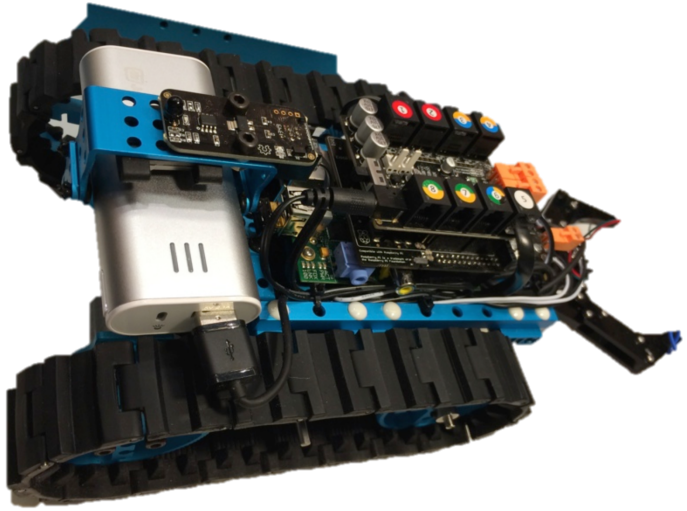
```
gpio = GpioFactory.getInstance();
lineFollowA = gpio.provisionDigitalInputPin(
              RaspiPin.GPIO_13, "LineFollowA");
lineFollowB = gpio.provisionDigitalInputPin(
              RaspiPin.GPIO_14, "LineFollowA");
startGPIO();

boolean leftSensor = lineFollowA.getState().isHigh();
boolean rightSensor = lineFollowB.getState().isHigh();
```

Line Following Algorithm

```
if (leftSensor && rightSensor) { //we are lost
  doDrive(lineLocation);
} else if (!leftSensor && !rightSensor) { //on the line
  lineLocation = Drive.forward; doDrive(Drive.forward);
} else if (!leftSensor && rightSensor) { //off the right
  lineLocation = Drive.left; doDrive(Drive.forward);
} else if (leftSensor && !rightSensor) { //off the left
  lineLocation = Drive.right; doDrive(Drive.forward);
}
```

Make your own Mr. Grabby

- MakeBlock Advanced Robotics Kit
- MakeBlock ME Base Shield
- Cooking Hacks Shield
- USB Battery (1A)



- Code here:

https://github.com/steveonjava/LineFollower

IoT Magic

Wearable Raspberry Pi

IoT Magic Hat

- ODROID-W
  - Raspberry Pi clone
- NFC/RFID Sensor
  - Adafruit PN532 chipset
- RFID Playing Cards
  - Mifare Ultralight tags embedded


RTC
MIPI-CSI
HARDKERNEL
SAMSUNG
USB HOST
Power

RFID/NFC Reader Configuration

- Pi configuration
  - I2C, SPI, or UART
- NFC configuration
  - libnfc to interface with the NFC reader.
  - pcscd to expose rfid readers to Java SE
  - idfnfc to bridge libnfc to idfnfc
- Java hacking
  - smartio API that is already a part of the JRE.

Getting a Card Terminal

```
TerminalFactory factory = TerminalFactory.getDefault();
CardTerminals terminals = factory.terminals();
List<CardTerminal> list = terminals.list();
CardTerminal cardTerminal = list.get(0);
```

Waiting for a Card

```
while (true) {
    cardTerminal.waitForCardPresent(0);
    handleCard(cardTerminal);
    cardTerminal.waitForCardAbsent(0);
}
```

Read Data

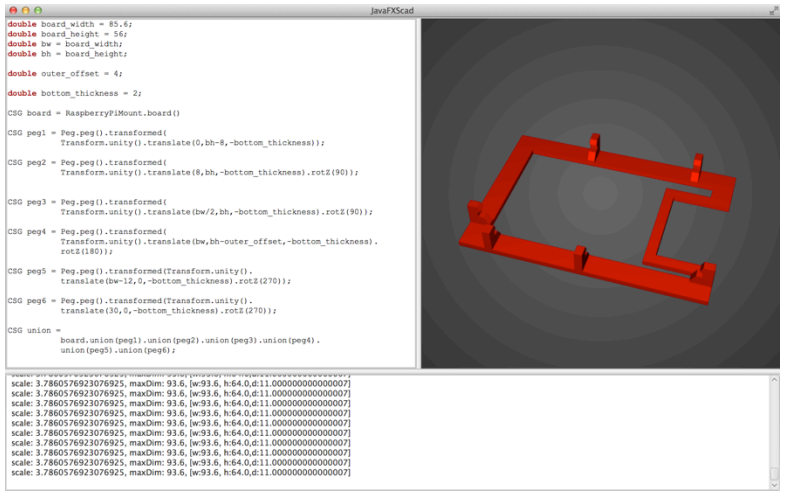
```
card = cardTerminal.connect("*");
CardChannel channel = card.getBasicChannel();
CommandAPDU command = new CommandAPDU(getAddress);
ResponseAPDU response = channel.transmit(command);
            byte[] uidBytes = response.getData();
```

Ultimaker 2


Ultimaker 2
EDAC

Java Constructive Geometry (JCSG / JFXScad)

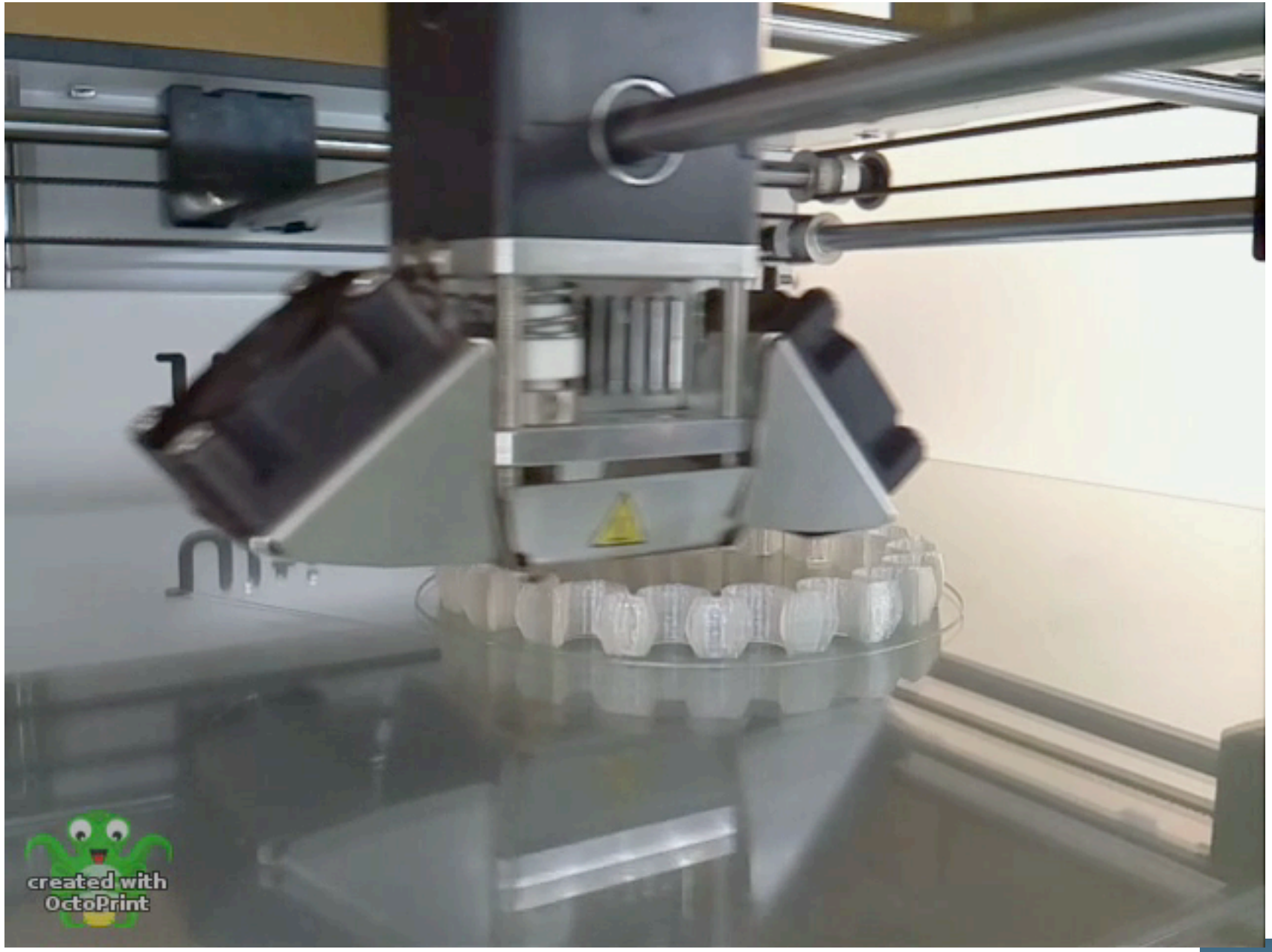
- Create geometries from pure Java code
- Visualize with a JavaFX user interface
- Generate STL files for 3D printing



- Project sites:

https://github.com/miho/JCSG

https://github.com/miho/JFXScad


created with
OctoPrint

New Book Announcement

- Raspberry Pi with Java

Stephen Chin
tweet: @steveonjava
blog: http://steveonjava.com

NightHacking Tour

Real Geeks
Live Hacking

nighthacking.com

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