

CBusJS – JavaScript Robotics

By Scott Preston

About Me

- Robotics Hobbyist Since 1990's
- Few Books – The Definitive Guide To Building Java Robots, 2006 & HTML5 & JavaScript Web Apps – Apress 2011
- Web, Mobile & Java Consultant In Columbus, Ohio

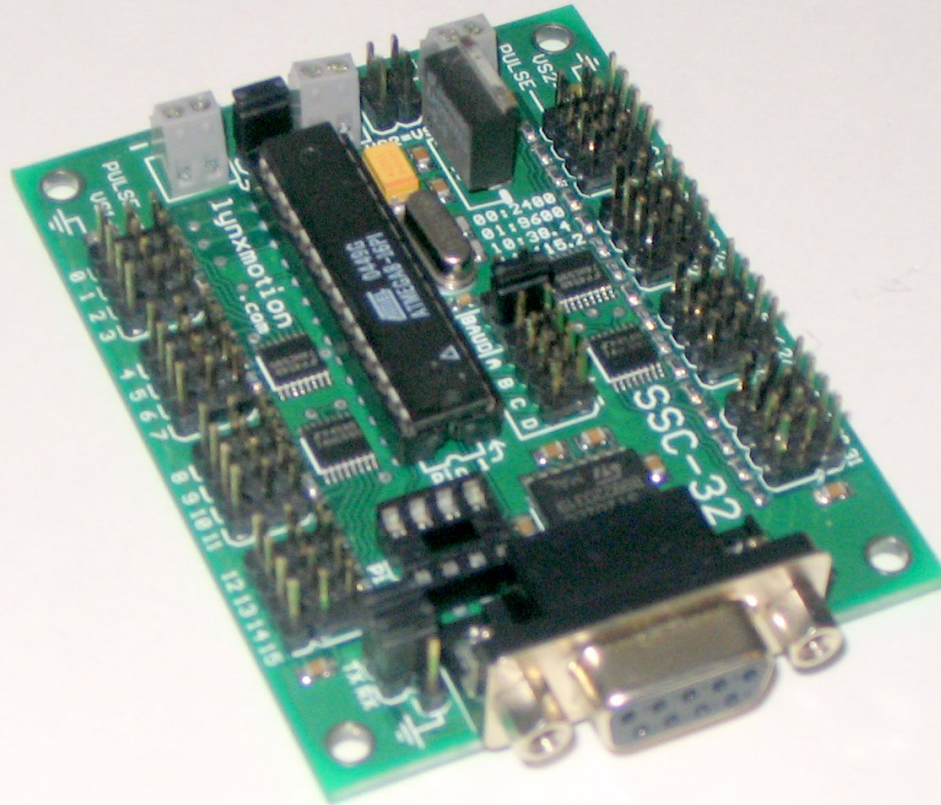
Overview

- The Hardware
- Node.JS
- Proxy
- Client Code
- All Code & Presentation on GitHub.

USB-Serial Adapter



Servo Controllers ~ \$40



4 Servos



2 Pan & Tilt Kits



2 Network Cameras



Ubuntu / VMWare / Node.JS

- Ubuntu 12.04 - More Stable Hardware Interface OS
- VMWare Fusion – For my OSX Machine
- Node.JS – 0.8.20 (latest)
- NPM – Serial Port (npm install serialport)

server.js

```
var http = require('http');  
var url = require('url');  
var linux_serial = "/dev/ttyUSB0";  
  
var SerialPort = require("serialport").SerialPort;  
var sp = new SerialPort(linux_serial, {  
    baudrate:9600  
});
```

server.js cont

```
function write(pin, pos) {  
    if (pin >= 0 && pos >= 0) {  
        var b = [255, pin, pos];  
        sp.write(b);  
        console.log("serial port writing on pin=" +  
pin + ", position = " + pos);  
    }  
}
```

server.js cont

```
var server = http.createServer(function (request,
response) {
    response.writeHead(200, {"Content-
Type":"text/plain"});
    var url_parts = url.parse(request.url, true);
    write(url_parts.query.pin, url_parts.query.pos);
});
server.listen(8000);
```

PHP Based Proxy

```
<?php
$cam = $_GET['cam'];
$url = "http://$cam/IMAGE.JPG?" . date('U');
$image = file_get_contents($url);
header('Access-Control-Allow-Origin:http://svr');
header('access-control-allow-credentials:true');
header('Content-type: image/jpeg');
echo $image;
```

Client Code

- SSC – Abstract Access to servo controller
- Eye – Individual Control of each eye
- Head – Control of both eyes
- Basic Image Processing
- Misc Glue – Timers, Loaders, Etc.

SSC Client

```
var Ssc = function () {  
    return {  
        move:function (pin, pos) {  
            var url = "http://ubuntu-dev:8000/?pin=" +  
pin + "&pos=" + pos;  
            $.get(url, function (data) { // do nothing});  
        }  
    }  
};
```

Eye

```
var Eye = function (panPin, tiltPin) {  
  var ssc = new Ssc();  
  var panPos = 0;  
  var tiltPos = 0;  
  return {  
    pan:function (pos) {  
      panPos = pos;  
      ssc.move(panPin, pos);  
    }...}  
  }
```


Head

```
var Head = function (leftEye, rightEye) {  
  return {  
    pan:function (pos) {  
      leftEye.pan(pos);  
      rightEye.pan(pos);  
    },...  
  }  
}
```

Image Processing

```
function isBlue(r, g, b) {  
    return (b > r + 75 && b > g + 75);  
}
```

```
function isRed(r, g, b) {  
    return (r > g + 75 && r > b + 75);  
}
```

Examples & Real Code

Thank You!

github.com/scottpreston/js-robotics

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