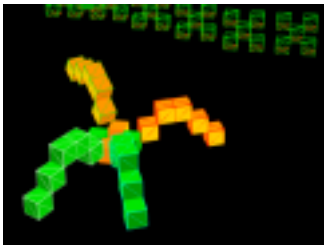
WebGL Spider



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jsc-solutions.net

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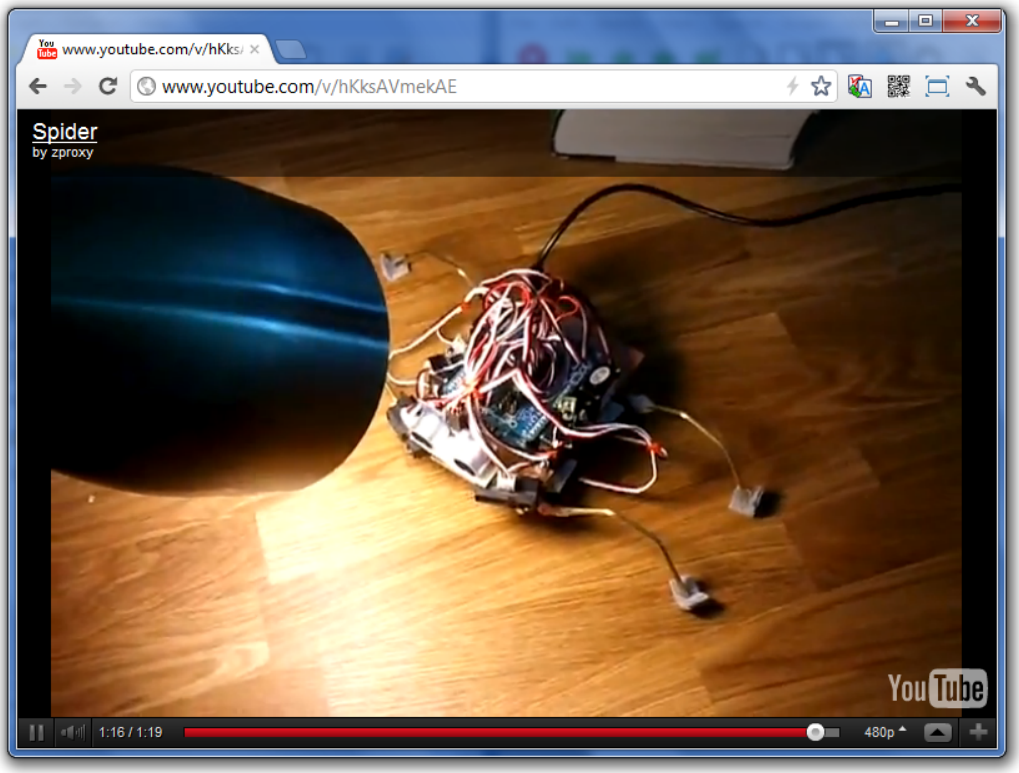

Figure 1.1: Physical Spider To Be Programmed

Chapter 1

The Why

[...] people do
buy what you
people buy w
you do it!

1.1 Intro

In 2011 I took a course. It was the **Advanced Topics in Biomechanics** course by **Adriano Cavalcanti, Ph.D**. During this course we had to come up with various 3D visualizations of different models. I chose to do that within WebGL. As a final task we had to come up with a mechanic spider. My part was to make it move. I had never programmed a robot before.

I was given a piece of hardware which had a few sensors and four legs.

1.2 Goal

For every project to be succesful a goal needs to be set. Avoid obstacles Go to thee light Stop when there

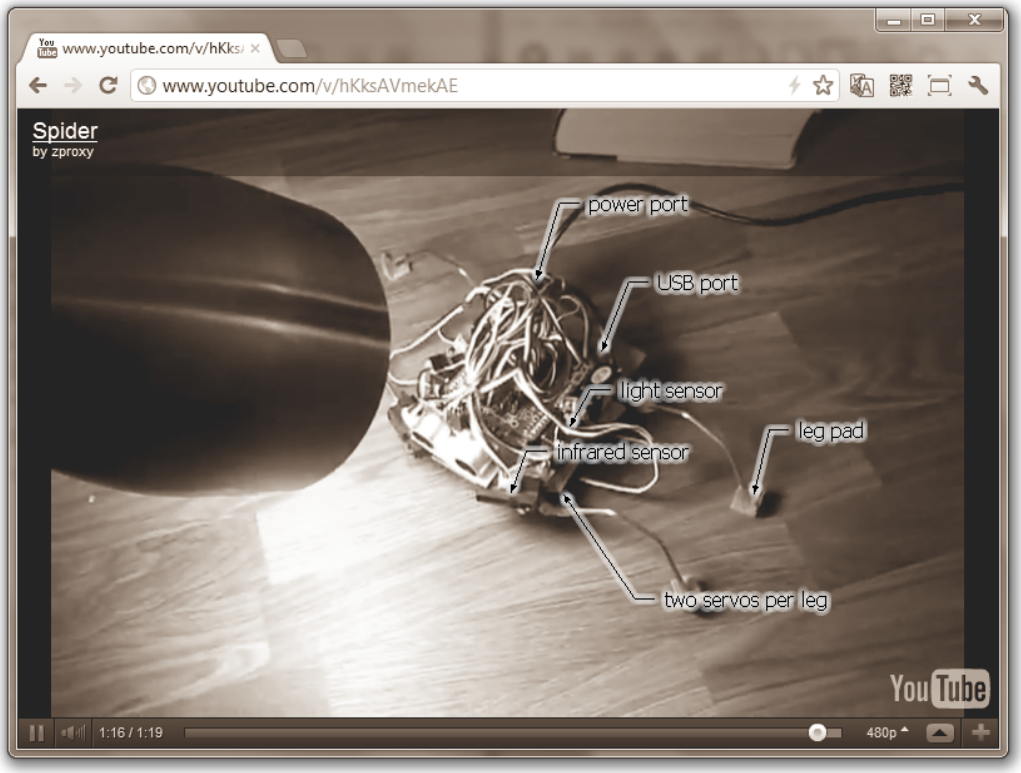

Figure 1.2: What can we see on the spider

Chapter 2

The What - Create a WebGL Spider

2.1 3D Visualization

In this chapter we shall have a look at how to build on this example on your machine.

Refer to the next section to install jsc!

```
chrome.exe -enable-webgl -enable-apps -ignore-gpu-blacklist
```

2.2 Arduino

Although this document briefly describes Arduino related development it is considered out of scope and is not part of the default **jsc eXperience**.

At this time jsc does not support any languages that target Arduino platform. As such I had to make use of Arduino programming language. Otherwise I could of had my CSharp code compiled to Arduino. This would of had allowed me to use the same code in the visualization and on the chip.

2.2.1 Lessons learned

While programming for Arduino I had to manually port my code I had written for the visualizer to the Arduino platform. In doing so I discovered that the int is considered to be 16 bits and that I cannot make use of function

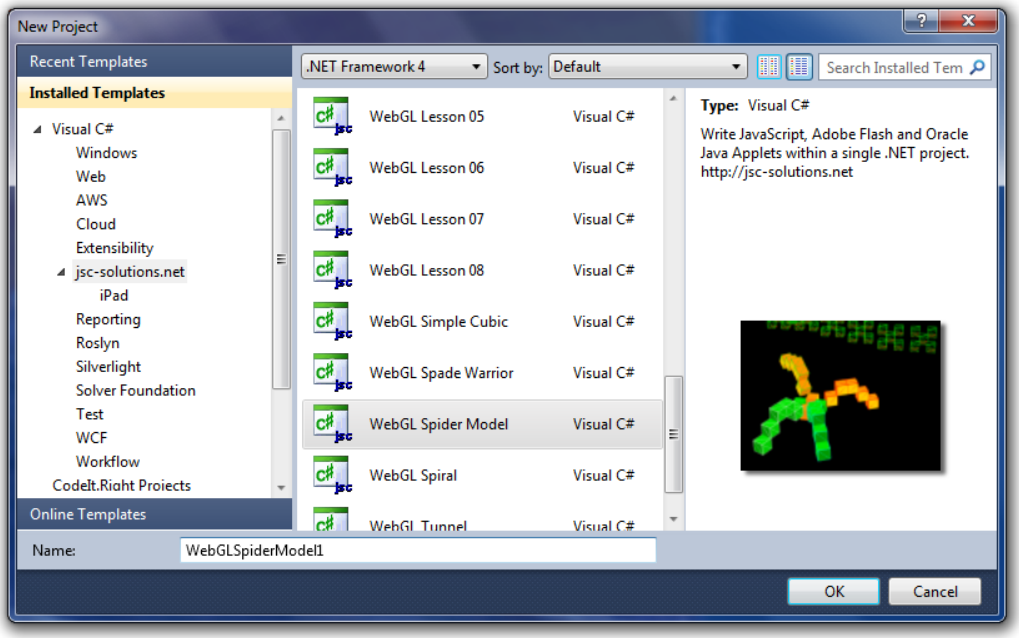

Figure 2.1: Visual Studio Web Developer Express - New Project

pointers. To overcome that I had to divide before I did my multiplication. Yes I had to track down an overflow bug before I realized this. The callbacks I used were simple. They only had a few parameters. This allowed me to replace the function pointer with pointer to variable and have the same behaviour of code.

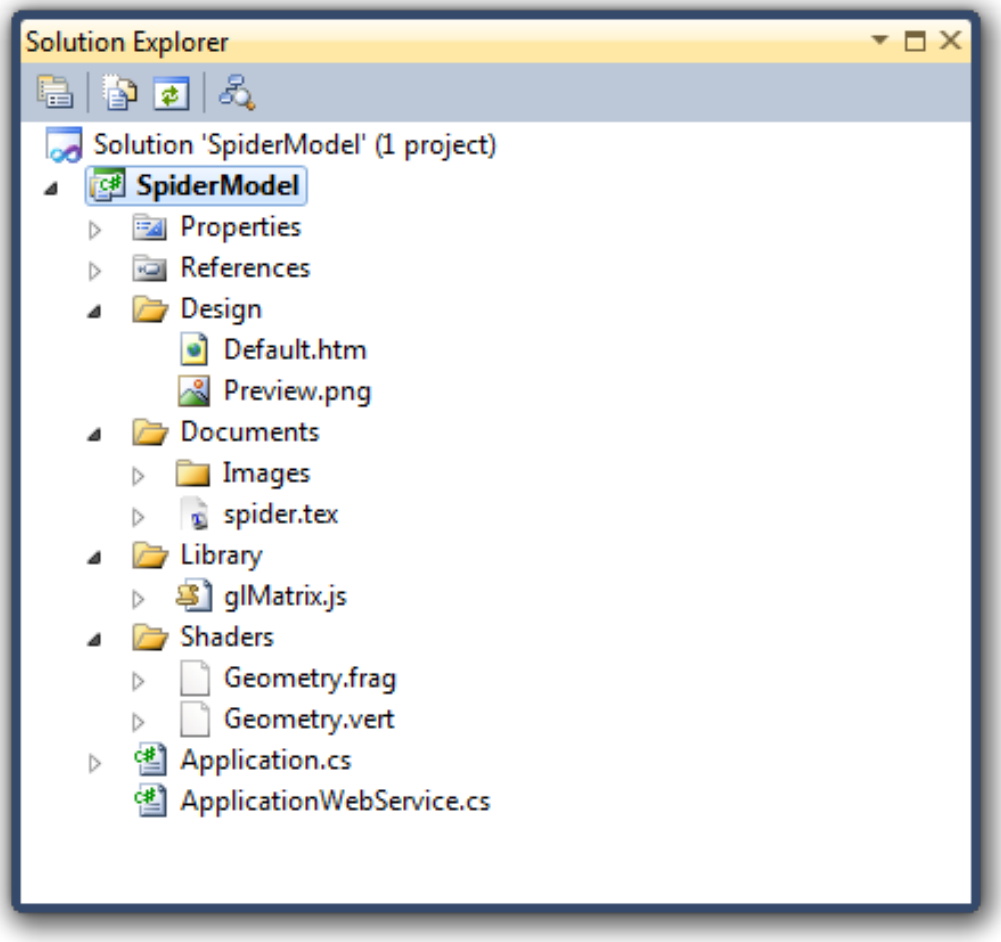

Figure 2.2: Solution Explorer

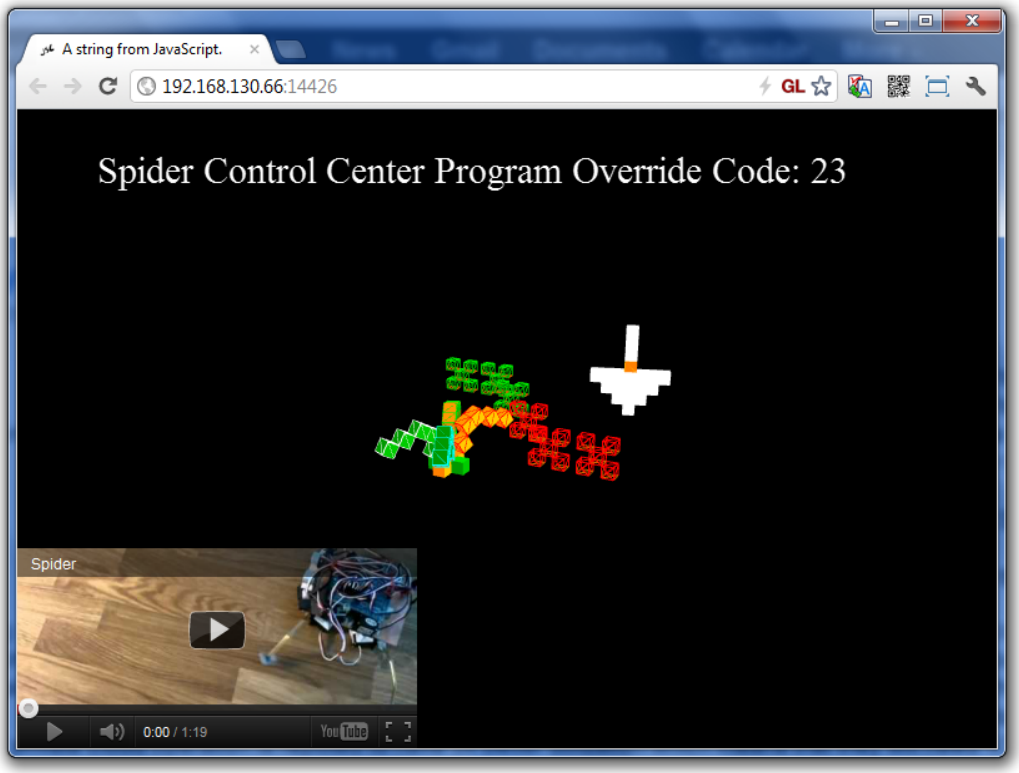

Figure 2.3: Program 23

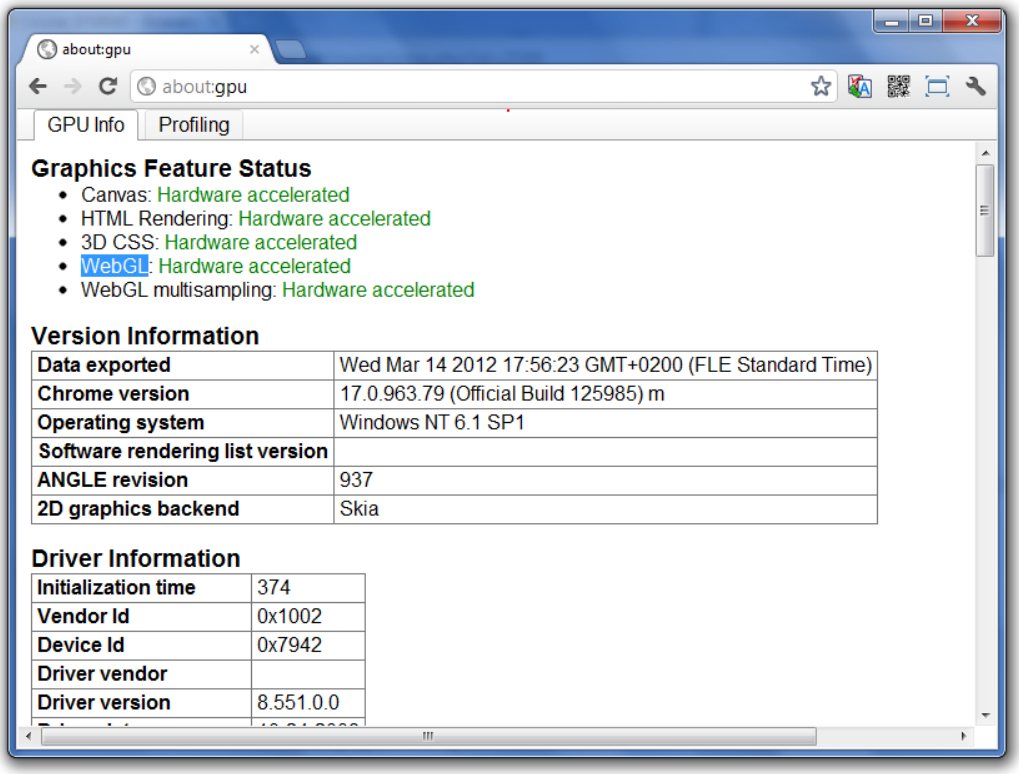

Figure 2.4: Make sure your device is supprting WebGL

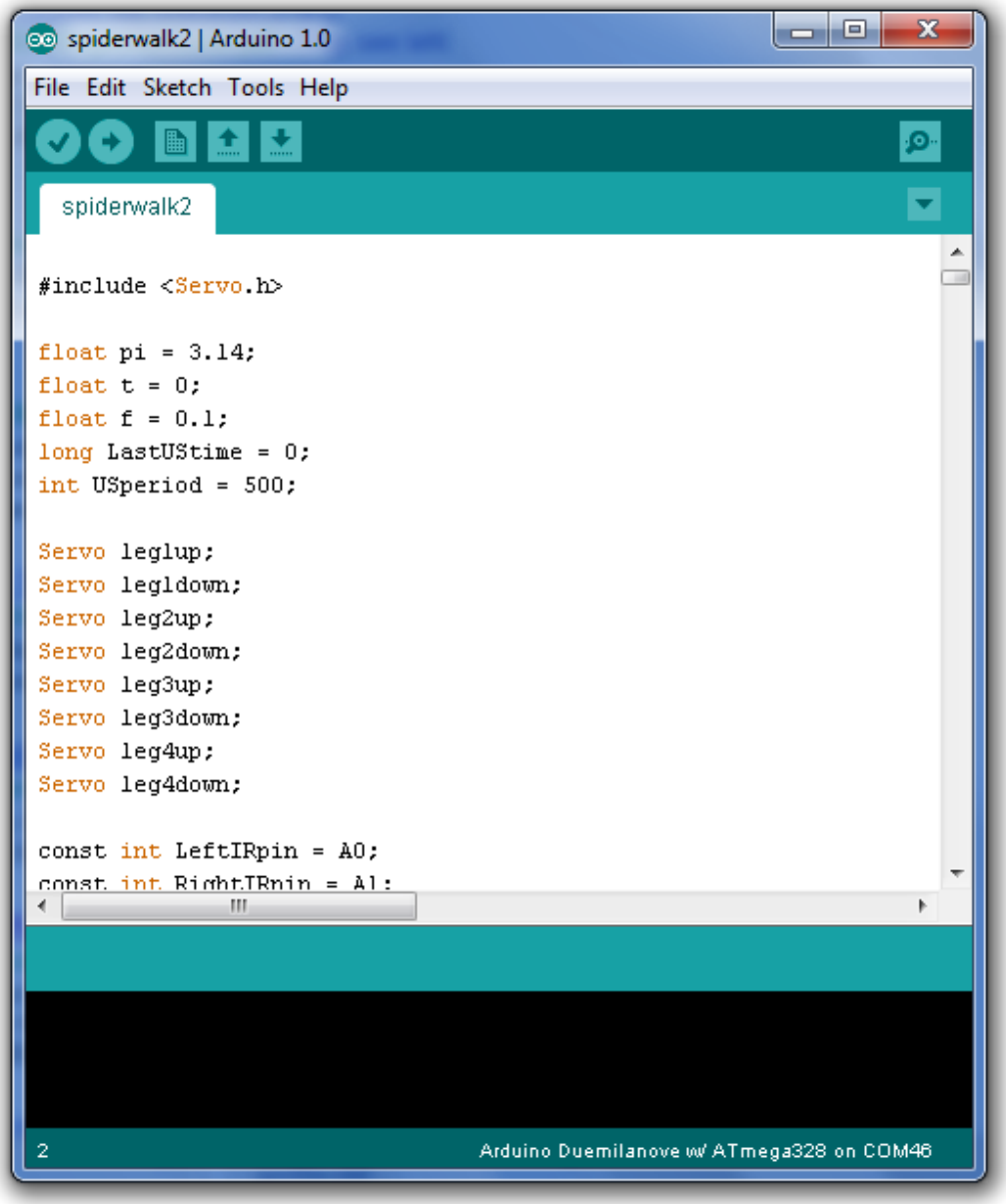

Figure 2.5: Arduino - spiderwalk2.ino

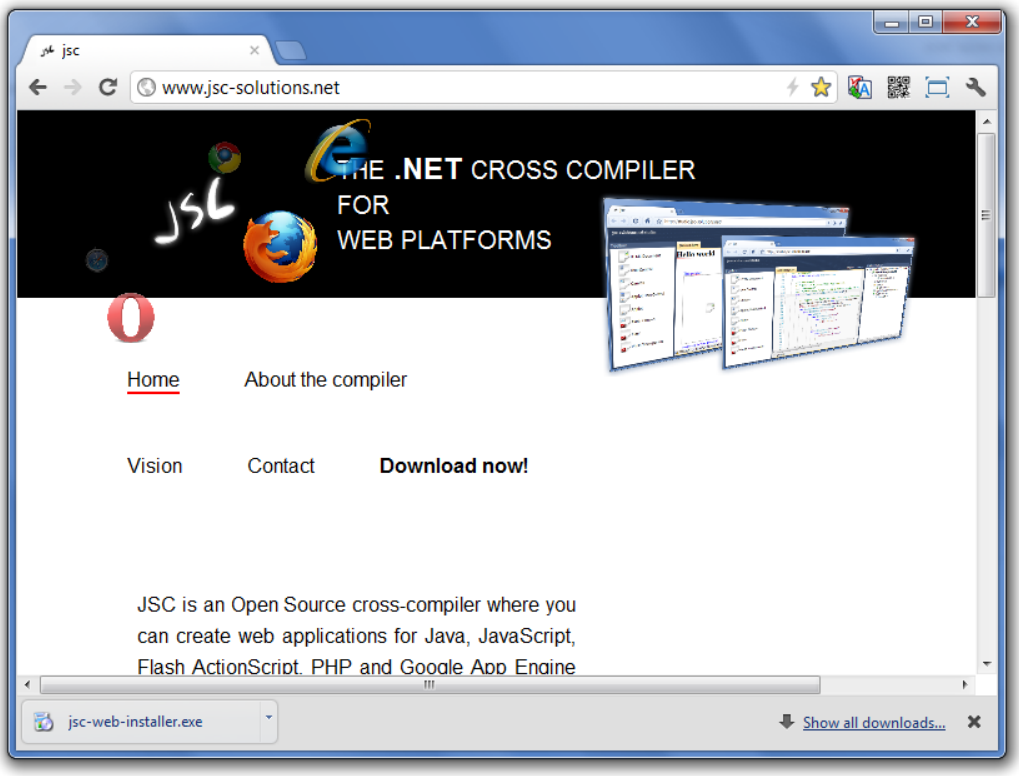

Figure 3.1: Download JSC at `http://download.jsc-solutions.net`

Chapter 3

The How - Install JSC

Installing JSC is easy. Before you do make sure you have installed Visual Studio 2010 Web Developer Express.

Chapter 4

References

`https://jsc.svn.sourceforge.net/svnroot/jsc/examples/javascript/ArduinoSpiderControlCenter/SpiderModel/Documents/spider.tex`
Source Video Installer Website Blog