

FastScript3D – A JavaScript Companion to Java3D

Patti Koenig Koehler[†]
Jet Propulsion Laboratory
California Institute of Technology

Abstract

FastScript3D is a web-friendly companion to Java3D that makes it easy to get started using Java3D via JavaScript and HTML. The benefit of FastScript3D is that it allows you to quickly and easily create Java3D web content without having to be an experienced Java3D programmer.

Keywords: Applets, Java3D, JavaScript

1 Introduction

Web pages can be greatly enhanced with interactive 3D graphics. Learning how to create such content using Java3D applets requires knowledge of several inter-acting languages including HTML, JavaScript, Java and Java3D. Piecing all of the required knowledge together can be overwhelming at first. FastScript3D is a set of simplifying, high level commands designed to ease you into 3D web applets.

The FastScript3D language consists of a series of simple commands for loading, animating and controlling the Java3D scenes from JavaScript. The system is designed to be easily extended: for instance, allowing for loading popular 3D file formats or providing extra capabilities. Communication between the web page, and the Java3D applet embedded in the page, is accomplished by constructing and passing these commands back and forth between JavaScript and Java3D.

2 Example

Figure 1. shows how FastScript3D looks as used with JavaScript. A simple applet is created of three 3D cubes, with the right and left cube rotating continuously. The FastScript3D commands are the capitalized text strings and are sent to the embedded Java3D applet called fs3d. The 3D model is defined beginning with the MODELCLEAR command and constructed with the MODELBUILD command. The NAME command creates a new component part and adds it into the scene under the desired parent part. The HINGE command defines an axis of rotation for the part. The JavaScript function sim creates an animation that continuously applies relative rotations to the left and right cube about their defined HINGE by three degrees. The demo function creates the model and activates the animation.

```
<!--A button is pressed to start the demo -->
<input type="button" value="Press here to start applet"
  onclick="demo();">
<!-- defines your embedded FastScript3D applet -->
<applet align="middle
  name="fs3d" code="easy.class"
  archive="fs.jar"
  width="275" height="275">
</blockquote> <hr>
If you were using a Java-capable browser,
you would see the graphics window here.
</hr>< /blockquote></applet>
```

```
<SCRIPT LANGUAGE="JavaScript">
function model() {
  this.document.fs3d.parse("MODELCLEAR");
  boxsize = 0.25;
  this.document.fs3d.parse("NAME redbox");
  this.document.fs3d.parse("COLOR red");
  this.document.fs3d.parse("HINGE 1 0 0");
  this.document.fs3d.parse("MOVABLE");
  this.document.fs3d.parse("OFFSET -0.5 0 0");
  this.document.fs3d.parse("GEOMBOX " + boxsize);

  this.document.fs3d.parse("NAME greenbox");
  this.document.fs3d.parse("COLOR green");
  this.document.fs3d.parse("GEOMBOX " + boxsize);

  this.document.fs3d.parse("NAME bluebox");
  this.document.fs3d.parse("HINGE 1 0 0");
  this.document.fs3d.parse("MOVABLE");
  this.document.fs3d.parse("COLOR blue");
  this.document.fs3d.parse("OFFSET 0.5 0 0");
  this.document.fs3d.parse("GEOMBOX " + boxsize);

  this.document.fs3d.parse("MODELBUILD");
}
function sim() {
  this.document.fs3d.parse("SIMNAME movethem");
  for (i=0; i<120; i++) {
    this.document.fs3d.parse("FNUM " + i +
      " RR redbox " + 3);
    this.document.fs3d.parse("FNUM " + i +
      " RR bluebox " + -3);
  }
}
function demo() {
  model();
  sim();
  this.document.fs3d.parse("PLAYAUTOON");
  this.document.fs3d.parse("PLAYRUN");
}
</SCRIPT>
```

Figure 1. FastScript3D Example.

3 Conclusion

FastScript3D enables users to create and control Java3D web page content via JavaScript and HTML. FastScript3D is easy to extend with new commands. Complete examples and source code can be downloaded from the FastScript3D web site.

Web References

<http://fastscript3d.jpl.nasa.gov/>
<http://java.sun.com/products/java-media/3D/>

[†]e-mail: Patti.Koenig@jpl.nasa.gov