Introduction

The virtual reality modeling language (VRML) is a language designed for describing 3D models and publishing them on the world wide web — in an analogous way that the hyper-text mark-up language (HTML) is a way of describing documents and publishing them on the world wide web.

The development of VRML began in 1994. In 1995 the VRML 1.0 specification was published and the first browsers became available. The VRML 1.0 specification was based on the file format of Open Inventor — a 3D C++ graphics library from Silicon Graphics. In 1996 VRML 2.0 was released by the VRML Architecture Group at SIGGRAPH 96. The first browsers appeared around the same time. VRML 2.0 gave significant advantages over VRML 1.0, including the ability to describe motion and behaviour of 3D objects rather than just static 3D models. In 1997 the VRML 2.0 specification was rewritten and submitted for ratification as an international standard. It became an ISO standard in 1998 and is now known as VRML 97. Browsers have also become widely available. In particular, cosmoplayer is available for both Netscape 4 and Internet Explorer.

Two good websites to start looking for information and examples of VRML are www.cosmosoftware.com and www.web3d.org.

Humanoid Animation

The Web3d consortium, formerly the VRML consortium, sponsors working groups to develop VRML extensions, applications or technologies in specific areas. One of the working groups is The Humanoid Animation working group.

“The VRML Humanoid Animation Working Group ("h-anim" for short) exists for the sole purpose of creating a standard VRML representation for humanoids.”

Assignment

The first assignment is to create a H-Anim 1.1 compliant humanoid which is capable of at least the following gestures or behaviours: wave, bow, kneel and walk. The gestures or behaviours should be triggered in response to user input. A full heads-up display (HUD) could be used to control the humanoid.

You should aim to produce a humanoid which is simple yet interesting, and which is low cost (space, time (including polygon count)). Your gzipped wrl file must be under 10K. Smaller, in general, is better.

You should use levels of detail in your humanoid to reduce polygon count where appropriate, including a simple box for long distances and a single point for even longer distances. It is best not to include textures: they tend to greatly increase file size. You should aim for low polygon counts, say in the hundreds. Don’t forget, spheres, cones and cylinders may be expensive as the browser will turn them into an unspecified number of polygons. If you want these shapes, you should use indexed face or line sets. Prototypes may be used to (drastically) reduce size.

You may create your h-anim humanoid by hand-editing it or by using a VRML authoring tool - cosmocreate is available on the SGI workstations. From the point of view of understanding
VRML, you are advised to hand-edit. Use of VRML checkers and compressors such as vorlon is also advised. You must use version control on your humanoid.

Scripting of behaviour using Javascript or Java is not required for this assignment (but is if you do a VRML world for assignment 2).

For this assignment you must publish your work by linking it off your CS547 web page. (You must set up a CS547 web page if you take the subject). Also required is a short write up (approx 1-2 pages including screen shots) report discussing what you have done including how you created your icon, how many polygons (or primitives) you have used, the size of your (uncompressed and compressed) file is, and a log of the changes you made to your icon.

You must use turnin to submit a tar file containing the final version and the res file of your humanoid.