VRML as a text-based language is a powerful, nevertheless simple language to build „virtual worlds“, which include 3D objects, light sources and animations. The functionality and degree of user interaction for a VRML environments can be enhanced, if the „External Authoring Interface“ (EAI) of VRML is considered for integration of a Java applet. User interfaces via comfortable Java applets can be build in order to give access to the VRML environment and to allow higher-level modifications.

One disadvantage of VRML is the need of a client browser-plugin. The Web3D consortium has developed a new 3D-data format called ‘X3D‘, which includes a small subset of VRML and enables the implementation of Java-based VRML browsers. Meanwhile Java-applet-based VRML and X3D browsers are developed by Blaxxun (Blaxxun3D) and Eyematic (Shout3D).

Both of solutions are working with pure Java and the earlier Java 1.1 Java virtual machines, so that for almost all web users no extra plug-in is required to see 3D-content. Both products doesn’t implement the full VRML97 specification nor the „External Authoring Interface“ (EAI) of VRML but each product has his own API to support the developer with EAI-similar features. The rendering quality and the rendering speed of the different solutions vary, because only software based rendering is possible with current JVM’s. The alternative Java3D-API supports hardware graphics acceleration but requires the newer Java 1.3 JVM, which is available as plug-in for IE and Netscape 4.xx browsers (already integrated in Netscape 6).

We have ported two of our Java applets to replace the EAI with the specific Blaxxun3D and Shout3D-API.

These applets, which provides an easy interface to explore the rotation transformation with Euler angles and Roll-Pitch-Yaw angles, are now platform independent and useable without any browser-plug-ins. The rendering quality of the Shout3D applet is better and faster than the Blaxxon solution, which has on the other hand a more standardized API-interface (X3D). These tools were developed to support our online robotic courseware.