CHAI:
An Open-Source Library for the Rapid Development of Haptic Scenes

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There is a need in the haptics research community for a suite of software libraries that enables the rapid development of device-independent multimodal virtual worlds. In this demo, we illustrate the features of the Computer Haptics and Active Interfaces (CHAI) libraries, an open source haptics development platform which we have developed and made freely available for download (www.chai3d.org).

CHAI provides an interface to a variety of 3-DOF and 6-DOF haptic devices, include Sensable's Phantoms (1.0, 1.5, Desktop, and Omni) and Force Dimension's Delta and Omega. It also includes a virtual haptic device (allowing the use of a mouse for development of algorithms when a haptic device is not available) and support for I/O boards (including Servotogo and Sensoray626). Triangular meshes may be created or loaded from files (.obj and .3ds formats) and automatically rendered graphically (with support for texture, material and transparency properties, as well as 3-D stereo display) and haptically (with built-in collision detection and a proxy algorithm). The open-source C++ libraries are designed to be easily customizable and extensible by the research community. MSVC 6.0, MSVC.net, and Borland C++ Builder 6.0 project files are included in the download, as well as a variety of examples.