



## Real World Virtual Reality: Creating Anatomical Models with QTVR

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**Reference:** <http://www.lib.uiowa.edu/commons/skullvr/>

**Abstract:** The primary objective of this electronic demonstration is to provide attendees with an overview of QTVR (QuickTime Virtual Reality) and its utility in the development of anatomical models integrated into computer-based learning software and web resources. Real world examples of virtual anatomical models will be shown.

Anatomy is best taught, and learned, as a hands-on activity. Students in the speech pathology & audiology training program at the University of Iowa lack easy access to materials with which to learn about the skeletal structures involved in speech production. These students rarely are exposed to either cadavers or articulated human skulls. The Information Commons, with nearly two years of strong experimentation and developmental experience using QTVR technology to produce anatomical models, has partnered with Dr. Jerry Moon to produce an interactive, three-dimensional computer-based tutorial/drill module. This module, still in production, is being designed to help students studying anatomy and physiology of speech production. Staff in the Information Commons are employing QTVR to produce anatomical models that will allow students to observe and manipulate the human skull and each of its 22 bones. The user will be able

to rotate an entire exploded skull on the computer screen, select a particular bone and view it from multiple perspectives. In order to aid the student in identifying and naming the bones and important features, a short tutorial section will guide the student through the anatomy of the skull. Subsequently, the student will be able to reinforce his/her learning through the use of a computerized drill. The QTVR components of the module are designed to meet the desired instructional goals of the instructor by providing the means for visualizing bones and processes in three dimensions. A scaled-down version, to be delivered via the web, also is being planned.

The capabilities of QTVR have been explored and demonstrated by staff in Hardin Library's Information Commons since 1996. Initial efforts in using Apple Computer's QTVR software involved panoramic VR. Commons staff members created a virtual tour of the facility delivered through the web. Later work focused on health sciences education applications, and the use of object VR. As a result of contacts made by Jim Duncan at the 1997 Apple Worldwide Developers' Conference in San Jose, CA, and through its continued work with QTVR technologies, the Information Commons was named one of the company's "seed" or beta-test sites for a project code-named "Leah." Following three months of testing, the software saw commercial deployment in fall 1998 as "QuickTime VR Authoring Studio." Since early 1997, the Information Commons has shown itself to be a campus leader in the development of QTVR products. Staff members have worked with faculty and instructors to create digital versions of many anatomical models and medical devices.

In addition to a preview of our computer-based learning module for skull anatomy, this electronic demonstration includes basic background on QuickTime VR (including technical requirements and hardware/software costs). Attendees also have the opportunity for hands-on manipulation of several virtual anatomical models. (continued on reverse)

The Information Commons  
Hardin Library for the Health Sciences  
The University of Iowa Libraries  
<http://www.lib.uiowa.edu/commons/>

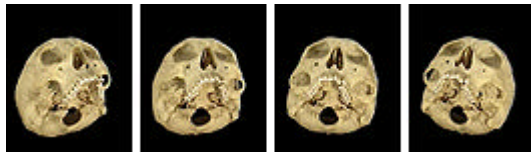
**Partial list of hardware and software used for this project:**

Item/Purpose	Vendor/Publisher	Est. Price
Magellan 1001 Object Rig * (model and camera rotation)	Kaidan	\$2,500
Pixera (traded in for camcorder, read below)	Pixera	\$1,200
DVX-1000 digital video camera (occasionally borrowed from another department)	Sony	\$4,000
Hi8 camcorder * (image capture)	RCA	\$2,200
4GB internal harddrive*	APS	\$300
Macintosh 8600/150	Apple Computer	N/A
QuickTime VR Authoring Studio (QTVR object construction including multi-node objects)	Apple Computer	\$300
PhotoShop (image post-processing)	Adobe	
Authorware (construction and delivery of the educational product)	MacroMedia	

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**What is a QTVR Object?**

Developed by Apple Computer, Inc., this technology simulates control of a virtual model by responding to an end-user's mouse movement. Clicking and dragging on an object left, right, up, or down will cause that object to rotate.



QTVR objects are an assembly of a sequence of photographs, taken of an model at various (but controlled) amounts of rotation horizontally and vertically. By showing these images within a single frame, a sense of movement is created.



QTVR objects can be played on stand-alone Macintoshes and Windows PCs, as well as within web browsers such as Netscape and Internet Explorer. QTVR objects can be played by any computer loaded with QuickTime 3.0 software. This system software is available for free and can be downloaded from the Apple web site at:  
<http://www.apple.com/quicktime/download/index.html>.