Using 3-Dimensional Models as a Front End for Knowledge

The objective of this research project is to connect a three-dimensional (3D) model of the human body to ontologies or hierarchies of knowledge in the corresponding anatomy. The implementation is accomplished by connecting a visualization program, based on Visualization Toolkit (VTK), to the Foundational Model of Anatomy developed at the University of Washington. The Visualization ToolKit is an open source, freely available software system for 3D computer graphics, image processing, and visualization. In the future, the user will be able to position the cursor within the 3D space to query the anatomical ontology. Querying the Foundational Model of Anatomy will return other information, including information such as what organs surround a selected organ.

The anatomical ontology is implemented using Web services that provide connection to various kinds of information and operations. Web services are based on some recent fundamental concepts including: Extensible Markup Language (XML) and Simple Object Access Protocol (SOAP). SOAP is a lightweight protocol intended for exchanging structured information in distributed environments. Web services are powerful because they provide greater interoperability and extensibility thanks to the use of XML. Programs providing simple services can interact with each other to deliver sophisticated added-value services. In this research project, web services are used to connect the Foundational Model of Anatomy, an otology of anatomy, to a 3D representation of anatomy. This work supports the ORNL Virtual Soldier Project.

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