3D Models of Articular Surfaces

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Abstract

The most prevalent type of arthritis is osteoarthritis which causes the breakdown of cartilage. Advanced image analysis techniques developed at Manchester enable the mapping of cartilage thickness. The data that is the outcome of such a technique can also be utilized to display bones and thickness maps as 3D models. These assist in a comprehensive visual analysis during a drug development strategy. As to facilitate the process, the project "3D Models of Articular surfaces" has been initiated. Its aim is to formulate a mechanism to generate web3D models. Software "3D Articular Surfaces Generator" has been developed that generates Web3D models of articular surfaces. It assists in the whole process of generating these models; it offers speed and simplicity to the task of visualization by utilizing their data files. Prototyping Lifecycle Model has been used for its development. The similar approach can be used for its further enhancement or for the development of new software for the research of other musculoskeletal diseases that require accurate and precise representation of data.

In this project, X3D format has been selected as a first step for web3D models. Its utilization is the most advanced and standard approach in this domain. Its customized structure has been formulated and used to build these models. A few of the sections of its specifications, browsers and plug-ins are still in the development phases. A number of its viewers have been considered, reviewed and suggested that currently support most of its used elements and provide a precise and meaningful 3D visualization. The various elements for further work have also been identified and briefly discussed. The structure, behaviour and interaction models have been presented with design and implementation of new software, that briefly illustrate the current progress and pave the way for further development.