Virtual Medical Device Development

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Technology description

Virtual Design for Medical Device Development

An integrated development environment has been designed that moves the design and testing of medical devices from the physical into the virtual world. The new technology provides an interface in which engineering design tasks can be overlaid on volumetric scientific datasets and combines automatic feature extraction and visualization. The design environment uses interactive supercomputing and 3D deep-data visualization along with human-computer interfaces to make the process of creation and simulation for medical devices a quicker, less costly endeavor. Similarly, the virtual design and prototyping allows for the testing of the devices in the anatomical environments they will be used in prior to physical production, allowing for alterations to design early enough in the process to save substantial amounts of money. The new virtual design and prototyping system is able to take information about human anatomy from CT and MRI scans in order to test how the virtual device will interact with the body, an aspect of design that is a current limitation with medical CAD software systems.

Current Medical Device Development

Effective medical device development is a fundamental and lucrative part of the healthcare industry that is currently an expensive and extensive process. The physical design and testing of medical devices usually requires animal and clinical trials, while competitive pressures urge fast production and testing. This often produces sub optimal results due to lack of sufficient insight about the design decisions and how they will interact with the anatomical conditions of patients. There is a need to increase the amount of analytical modeling and simulation of the interaction between devices and the anatomical environment for which they are intended early in the design process to increase the effectiveness of product design and reduce costs. This shift will focus developers on the virtual testing of device concepts rather than physical models. Current commercial software packages that are used for analytical modeling are incompatible with each other, which can slow down or confuse the editing and testing process. Therefore, one system which is universally compatible and able to be accessed by many users to create a fluid analysis and design editing process is necessary to limit time and cost.

Institution

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