The Effect of Stakeholder Data on a Fuzzy Based Modular System for Medical Device Design and Development

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The goal of this research is to determine how customer ratings affect the final outcome, which is to determine the optimal number of modules for medical device design. Medical devices have a 90% failure rate in their first prototype tests according to the international testing body, Intertek. To address this key issue of quality, we present an integrated, collaborative modular architecture method for medical device design and development. A typical glucometer is used as proof of concept to demonstrate the methodology and analyze the impact of changing the customer ratings on the optimal number of modules and minimum deviation. The implication of this research is to generate scholarly work and to reduce the number of potential failure points in medical devices by determining the optimal number of modules.

An Automated Method for Creation of Patient-Specific Volumetric Articular Cartilage Elements in the Human Foot

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An automated method for the creation of patient-specific volumetric articular cartilage elements in the human foot is presented. The algorithm generates visually accurate (based on depictions in the literature) articular cartilage elements by identifying contact surfaces on adjacent bones in a computationally effective manner based on a distance threshold criterion. This method provides an automated and practical cartilage model when compared with current methods, which include scan-by-scan identification and selection, a highly user-biased and tedious process.