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Using CAD – CAM Technology in The Design of Prosthetic Devices

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Abstract:

During last years a lot of improvements have been put on in order to develop many products by the introduction of computer-aided tools, to reduce the cost and time of the Design and Manufacturing process, and to have a faster and cheaper evaluation for different variants of the same product. Also, a great interaction has been happened between the custom-fit of products character-rized with the human body or part of it. Innovative computer-aided tools could support to realize custom-fit products with a strict interaction with human body and definitely improve people's life style, in particular of persons with disabilities. This research presented a specific-fit of the lower limb prosthesis, which can guide and support the user of prosthetic devices, it has been studied the history and improvement of prosthetics, the modular ones that mainly composed by commercial components, except for the socket that is highly customized and manufactured around the patient stump. All the product and process knowledge is strictly correlated to a specific set of parameters, which guides the whole prosthesis design process: the patient's characteristics. In particular, these data are necessary to select the appropriate standard components, to model a functional socket according to the patient's anatomy, and creates the 3D model of the socket. The proposed framework is centered on the digital model of the amputee and directly manages the experts' knowledge in order to guarantee a product of high quality, commercial 3D CAD system has been adopted to create a library of 3D parametric models to represent standard components and for final prosthesis assembly.

Keywords

CAD – CAM Integrated System, 3D scanner, Bio sculptor, Bio Scanner, Design, Prosthetic Devices, Powered Prosthesis.

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