Use of Computer Manikin Software in selected industries for product design and production planning

Computer manikins are 3-dimensional structural models of humans with anthropometric dimensions of a certain population group. Depending on the degree of sophistication of the software the manikins can be programmed to move and carry out different tasks in simulations of work, e.g. assembly operations. Software with computer manikins are used together with other software for ergonomic evaluation/simulation of products and product functions in order to adapt the design to human capabilities. In work system design the manikins are used in ergonomics design and evaluation of workplaces but also for work activities such as assembly operation scheduling and timing. An important task is to evaluate if there are any risks for work related disorders and eliminate them in the planning stage before any physical item have been created to save on costs. There are different types of commercial software with computer manikins available which companies use in their planning processes. The interest and need in industry has been increasing as part of the ongoing digitalization. In Sweden the computer manikin software IMMA is under development, see http://www.fcc.chalmers.se/software/ips/ips-imma/. The development in the field of applied human modelling and simulation have been going for a while. Computer manikins are used not only in manufacturing industry but also in a large number of other fields, e.g. entertainment, cloth design and space applications. An early start could be seen with rather primitive manikins in the late 1960-ies, but now many commercial manikins and a fairly extensive literature are available, see e.g. Duffy, V.G. (Ed.), 2012, Advances in Applied Human Modeling and Simulation. CRC Press, Boca Raton.

The purpose of this thesis project is (1) to gather information on the common computer manikins software in use today and compile a listing with relevant information of their characteristics, manufacturer and which companies are using them, (2) to make listing of which companies are using the computer manikin software and how, what questions they are seeking answer to and how the results are documented and archived, and (3) what problems and needs do the users see. Interesting related questions are the education and competence of the users, whether they are engineers or ergonomists, etc. A forth purpose is to look into the ongoing development of computer manikin software to see what new characteristics and functions can be expected in the future and relate that to the users’ needs.

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