

## 3D Body Scanning, Size Surveys and Avatar Generation as Door Openers for 3D Apparel Product Development

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### Abstract

Due to major technological advancements and enormous cost pressure, virtual 3D product development has evolved in recent years from an innovation technology to a basic application in the apparel sector as well as in many other industries. This development was further accelerated by the Corona crisis and the associated restrictions on fit testing of physical sample parts on real models. In the meantime, all companies and their global counterparts are looking into the use of these technologies in the areas of technical product development and sample testing.

Components of this apparel development chain are digital, virtually sewn pattern, material parameters to simulate the properties of the textile and, last but not least, a suitable avatar, i.e. a digital twin of the actual customer on which the product can be fitted. The integration of the customer into the virtual development process takes place on the basis of 3D body scan data, which must be recorded as part of measurement surveys and prepared accordingly for implementation as an avatar. More and more companies are interested in using avatars throughout the entire chain of apparel production, right up to the product offering in ecommerce. This results in new requirements for the scanning process on the one hand and a new awareness of the value of human data on the other hand. So body scanning technology can be considered as one of the key technologies to integrate the customer into the virtual world of digital product development.

Since the end of the 1990s, the first 3D body scanners were developed with the idea of mass customization, that attracted a great deal of attention in all sectors of industry. The basis for the individualization of products is the precise knowledge of individual body shape and measurements, to which a product is then adapted accordingly. At that time, therefore, high-precision full-body scanners were developed that could record the body in 3D with millimeter precision using eye-safe laser technology. Such scanner solutions are now used in almost all measurement surveys worldwide, as they can capture the human being in various postures and provide a large number of ISO-compliant body dimensions.

One requirement resulting from this, however, is a comparatively large footprint combined with a relatively static setup. Conversely, the requirement to go with the body scanners to where the people to be measured are located has been steadily increasing, so the necessity for mobile scanning solutions has become more important. Due to the spread of the internet and the increasing use as a sales channel, new generations of "scanner solutions" have emerged in recent years, which can be made available to the end consumer in the form of web services or via an app on a cell phone. Scanning technology now comes to the user - and not the other way around.

However, the random collection of as many 3D data as possible from customers via apps or by mobile phone alone is not yet a sufficient basis for generating realistic 3D avatars that exhibit the individual body shape characteristics of the specific target group. Only if statistically valid data from representative measurement surveys are available with a corresponding degree of accuracy, apps and alternative measurement approaches are able to make predictions for 3D avatars at all, despite the more imprecise input data.

Representative size survey data are also the basis for creating standard avatars that reliably represent a broad target group and its socio-demographic characteristics and fulfill a different objective than individual avatars.

Avalution has been conducting representative measurement surveys worldwide for many years, and on this basis creates both, individual and standard avatars, for use in 3D product development. Extensive avatar experience has been built up in the course of numerous customer projects and insights will be presented.

\* <https://www.avalution.net>