Methods of 3D data applications to inform design decisions for physical comfort - DTU Orbit (26/04/2019)

Methods of 3D data applications to inform design decisions for physical comfort

Many everyday tasks require physical contact with products, such as helmets, headsets, etc. There is a drive for comfortable products that fit the task and the human body, especially in the industry of external ear worn products. Past research on anthropometry stresses that positive comfort is enhanced when there is sufficient knowledge of human factors. The majority of these studies focus only on the acquirement and presentation of anthropometric data. This paper examines the incorporation of anthropology in the design of external-ear devices. The aim of this paper is to provide different methods to support design applications (ways of analysis) of 3-dimensional head and ear data with a focus on external ear products. 200 persons representing the Danish population were scanned. The 3-d data was collected, refined and analysed. A matrix containing 29 new ear dimensions was generated. An analysis of the dataset through understanding of human and product geometry and methods of visualisation of the dataset generated an additional number of 9 advanced dimensions. The paper finally presents all phases of the analysis of the 3D data in the form of a methodological framework. The paper contributes with, in addition to the methodological framework, techniques to extract data based on a mathematical and product understanding, visualisation of data and manual extractions and how the data can be used to define archetypes for focus groups and other qualitative assessments. In their endeavour to develop successful and comfortable products designers should focus more on fitting the task into the human by benchmarking human dimensions against product data.

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