
REGRESSION-BASED PREDICTION OF COMFORT IN SOFA DESIGN: A STUDY ON KEY DESIGN VARIABLES

Emel Kızılkaya Aydoğan¹, Fatih Emre Boran², Yılmaz Delice³, Esra Akgül⁴, Orbay Çağlayan

Şimşek^{5,*}, Feride Delice⁶, Müjgan Durmuş⁷, Diyar Akay⁸

¹Erciyes University, Department of Industrial Engineering, Kayseri, Türkiye

²Gazi University, Department of Energy Systems Engineering, Ankara, Türkiye

³Kayseri University, Department of International Trade and Logistics, Kayseri, Türkiye

⁴Erciyes University, Department of Industrial Design Engineering, Kayseri, Türkiye

⁵Erciyes University, Department of Dean for Research, Kayseri, Türkiye

⁶Kayseri University, Department of International Trade and Logistics, Kayseri, Türkiye

⁷Yataş Group, R&D Center, Kayseri, Türkiye

⁸Hacettepe University, Department of Industrial Engineering, Ankara Türkiye

ABSTRACT

A sofa design is possible to be highly personalized depending on the users or their specific need for comfort. Besides the size, the key dimensions that significantly influence the perception of a sofa's comfort by the user include properties like seat depth, seat height, armrest height, overall width, and backrest height. It is very common for designers to approach these parameters with a view toward providing sofas in various contexts to cater to a wide array of preferences and body types. This study is a research into how such design factors can affect perceived comfort by testing 21 different models of sofas made by a market-leading furniture company. A questionnaire was applied to 69 participants for them to grade each of the sofa models with respect to comfort perceived. The participants rated their comfort experiences in relation to several attributes, such as seat height, arm breadth, seat depth, seat breadth, gap between arms, and back support offset. This was meant to give an overview of how multiple design elements impacted an individual's overall experience. The information from the participants was summarized into the development of a regression model that would predict comfort levels with the use of exact dimensions for a sofa. The input data have been filtered into the regression model on a scale ranging from 0 to 100 to allow normalization and maintain consistency. It is a standardization, which allows for avoiding potential bias due to the changing scale factor of various design parameters. The statistical software gave, as a result, a model with an impressive R-square value of 0.928, showing extremely strong relationships between sofa dimensions and comfort ratings given by participants. These findings can provide designers and manufacturers with better insights by showing quantitatively what improvements are needed to make sofas more comfortable. This study will help designers make informed decisions at the product development stage itself to improve user experience with the sofa. This adds to the existing literature on furniture design from an ergonomical point of view and underscores the importance of active participation by users in optimizing comfort.

Keywords Sofa Design · Comfort · Statistical Analysis · Regression Model

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*Corresponding Author's E-mail: orbaysimsek38@gmail.com