عنوان مقاله:

A two-phase hybrid product design algorithm using learning vector quantization, design of experiments, and adaptive neuro-fuzzy interface systems to optimize geometric form in view of customers' opinions

محل انتشار:

مجله مکانیک کاربردی محاسباتی, دوره 52, شماره 2 (سال: 1400)

تعداد صفحات اصل مقاله: 26

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خلاصه مقاله:

One of the most important characteristics of a modern product is the extent to which it meets the needs of customers to gain market share. The conceptual design methods of products based on customer requirements are often feature-based, in which several features are identified between different types of a product. According to customer demands, these features are tuned and the closest is selected as the optimum. The great variety of features of a present-day product can often make this difficult because finding these common features is very complicated or even impossible. To solve this problem, choosing the optimal design is divided into two phases: In the first phase, the main product is divided into some basic categories and according to the customers' opinion, one is selected as the "winning category". In the second phase, the selection of common geometrical features between the members of the winning category is made. Then, the optimization process is done based on customer rating and the closest design to the mentioned rating is selected. The house light switch is used as a case study and the proposed algorithm is implemented on it. High customer satisfaction with the optimized final design, high response rate to survey forms, and the low number of incompatible data, all, indicate the suitability of the proposed algorithm with human interface characteristics, simplicity and efficiency in adapting the product to the customers' view. This method can be used for other industrial products .and even for non-industrial products or services

کلمات کلیدی:

Product Design, geometric form, Design of Experiments (DOE), Learning Vector Quantization (LVQ), Adaptive Neuro-(Fuzzy Interface System (ANFIS