Abstract:

The selection of the optimum material from two or more materials based on two or more independent attributes requires the application of Multi-Attribute Decision Making (MADM) which requires the quantification of the considered attributes. When materials are to be selected based on sensorial attributes, quantification becomes extremely difficult due to the ordinal nature of the linguistic terms used to define these attributes. Assignment of nominal scales for sensorial attributes has been used popularly to provide quantified measures of the linguistic terms, but the assignment of constant-valued scales does not account for the variation in perception of the linguistic terms to define the sensorial attributes. This paper proposes a novel method to account for the gap in user’s and designer’s perception in the material selection process based on sensorial attributes. It provide a method to morph the constant-valued scales for sensorial attributes from user’s perception to designer’s perception based on the gap in perception between them. It then applies the morphed scales to material selection using the Target-driven VIKOR method.