On Developing a Decision-Making Tool for General Applications to Computer Vision

Abstract

The general applications to computer vision are full of problems expressed in terms of mathematical energy optimization. In this context developing a reliable optimal design process for the non-uniform rational b-spline (NURBS) curves and surfaces which in fact has a wide and foundational application in image processing, computer aided geometry design (CAGD), computer aided design (CAD) and computer animation, is the focus of this work. Yet the optimal design and parameter tuning of the NURBS is a highly non-linear and complicated multiobjective optimization (MOO) problem. The complexity of the problem is even increased when the criteria of product beauty is included to the design process. In this article for an optimal configuration, the operating design parameters are tuned within the proposed interactive multicriteria decision making (MCDM) environment where the decision maker (DM) is included into the process. Along with presenting the NURBS's optimal design problem the drawbacks to the former approaches are reviewed, and the applicability of the proposed decision-making tool in the general applications to computer vision is described.
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