Multivariate Design for Mass Customization of Consumer Products

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Abstract—In this paper, we propose a model and a solution procedure to minimize the cost associated with mass customizing consumer products in the presence of multivariate constraints. Three algorithms based on enumeration, steepest descent and Lagrange relaxation are used to solve the non-linear optimization problem and their performance is evaluated with numerical experiments. The sufficient and necessary conditions under which the optimal solution can be achieved are presented as well.

Keywords-Mathematical model, Cost minimization, Nonlinear programming, Multivariate percentile, Anthropometric Design.

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