A Tunable Swarm-Optimization-Based Approach for Affective Product Design

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Abstract: - An approach for affective product design using a hybrid of tunable particle swarm optimization (PSO) and Kansei engineering is proposed. Customers' emotive responses to a product are collected using a questionnaire designed on Kansei engineering principles. They are used to create models which can suggest design parameters for the product that may implicitly embody customers' emotional preferences. These models are created by PSO algorithms, tuned to use the best possible velocity update equation and neighborhood configuration. Results of a pen case study are compared by means of the relative mean squared error with respect to the difference between predicted and known target values. Secondary differentiation of performance is obtained using the statistical measure of the coefficient of variance.

Key-Words: - Emotive Design, Product Design, Particle Swarm Optimization, Neighborhood Configurations

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