

Kansei Engineering and Soft Computing: Theory and Practice

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Features

- ▶ Fusion of the Kansei and soft computing techniques from a variety of viewpoints
- ▶ Focus on the solution of real-world problems by conducting the Kansei
 - Uncertainty
 - Imprecision
 - dependence on the context
- ▶ Cutting-edge research on the measurement of kansei and its application

Contents

- ▶ Two parts comprising of 19 chapters
 - Basic Concepts, Framework and Techniques
 - framework of soft computing
 - current soft computing techniques
 - kansei factors' processing in dynamic systems
 - Measurement, Analysis, and Representation of Kansei
 - psychological and physiological measurement of kansei
 - representing kansei by the relationship between human's feelings and physical attributes of entities
 - incorporation of kansei into product design

Featured book chapters

- ▶ **Chapter 1: Soft Computing and its Applications**
 - three essential paradigms of soft computing
 - neural network
 - notions, methodologies, and some algorithms
 - fuzzy logic
 - fuzzy set theory
 - evolutionary computation
 - heuristic search techniques
 - methods for applying soft computing techniques to real-world problems, including kansei-related issues

Featured book chapters

- ▶ **Chapter 3: Text Mining for Analysis of Interviews and Questionnaires**
 - Basic text mining techniques, including keyword extraction, word graphs, clustering of text and association rule mining
 - a case study using text mining
 - About the analysis of interviews and questionnaires
 - revealing the opinions, concerns and needs of subjects

Featured book chapters

- ▶ **Chapter 6: Kansei Database and AR*-tree for Speeding up the Retrieval**
 - General flow of kansei retrieval systems
 - Structure of a typical kansei database
 - Indexing technologies of objects for kansei retrieval
 - An adaptive R*-tree method that is quite appropriated for the kansei database retrieval

Featured book chapters

- ▶ **Chapter 7: Emotional semantic detection from multimedia: a brief overview**
 - a general overview of research on affective analysis of multimedia contents
 - recent research on detecting emotional semantics from images, videos and music
 - three typical archetypal systems related to the three fields of images, videos and music
 - several critical problems, and strategies for problem resolution

Featured book chapters

- ▶ **Chapter 8: Fuzzy Logic for Non-smooth Dynamical Systems**
 - fundamental concepts of non-smooth dynamical systems
 - Takagi-Sugeno fuzzy modeling
 - Expanded to represent a non-smooth system
 - applied to a stability analysis to predict the onset of structural instability
 - implying the potentiality of inferring the bifurcation of kansei evaluation
 - product design, painting, music video production, etc.

Featured book chapters

- ▶ **Chapter 10: Music and Kansei**
 - presenting approaches for kansei research on music components, such as melody and rhythm
 - Introducing Methods for analyzing relations between music components and kansei evaluation based on principal component analysis
 - revealing the effect of arrangements of modes on human impressions
 - Constructing a real-time melody recognition system

Featured book chapters

- ▶ **Chapter 11: Analyses of people's perceptions on sidewalk environments**
 - investigating the relationship between people's perceptions of sidewalk and its relevant elements
 - adopting factor analysis and the rough sets approach to determine
 - the most important attributes to people's perceptions
 - minimal attribute sets without redundancy
 - a series of decision rules
 - representing the relationships between perceptions and the physical components of sidewalk environments
 - promoting better understanding of people's perceptions of sidewalk environments

Featured book chapters

- ▶ **Chapter 12: Affective Facial Expressions in Kansei Robot “Ifbot”**
 - Presenting the development of a kansei communication robot, Ifbot
 - Associating the facial expressions with human emotions using an auto-associative neural network
 - Discussing methods for generating expressive faces that convey human emotion
 - Proposing a method for creating personality through facial expressions

Featured book chapters

- ▶ **Chapter 15: Psychophysiological Applications in Kansei Design**
 - Presenting approaches for incorporating kansei (human feelings) into system design
 - Studying three approaches involving the relationship between psychophysiology and the design
 - Developing tools and methods with respect to human inspiration, behavior and mental images of the design process
 - real-world examples and applications supporting each of the proposed approaches

Featured book chapters

- ▶ **Chapter 16: Analyzing Coordinate Relations in Handwriting Activity: Tacit Skill and Individuality**
 - presenting a framework for tacit handwriting skill analysis
 - Presenting a technique for detecting human individuality by analyzing handwriting captured by a computer writing pad
 - simulation experiments with benchmark data supporting the proposed approach

Featured book chapters

- ▶ **Chapter 18: Kansei's Physiological Measurement and Its application- Estimation of human states using PCA and HMM**
 - presenting bioelectric signals
 - estimating human mood states by bioelectric signals in combination with PCA, HMM and NN approaches
 - demonstrating the possibility of measuring and analyzing kansei using physiological signals