SUMMARY OF Ph.D. DISSERTATION

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Title

Studies on Design Support System reflecting Kansei
with Interactive Evolutionary Computation

Abstract

This study aims at developing systems with nonverbal sensitivity-driven communication technology to support designs, layouts, and other planning challenges that require Kansei. The systems use cutting edge multimedia technologies to reflect Kansei.

First of all, the conversion of Kansei to specific quantities for designs needs the obvious relationship between Kansei and such values. This is too complicated to be solved by using conventional methods; artificial intelligence tools and neural network systems treating this issue take long time and hardly reflect personal Kansei in designs.

On the other hand, many researchers have focused on studying interactive evolutionary computation as one of effective approaches to solve the problems of mixing and matching a variety of elements in intellectual endeavors. However, it is often pointed out that the interactive system also take long time until the design drafts are shown and the users generally get tired after evaluating many drafts.

Chapter 1 is the introduction of this study and describes the advanced technologies used in the proposed design support systems, which are virtual reality, Kansei information processing, and interactive evolutionary computation, and their research backgrounds.

Chapter 2 gives an outline of the concept and the basic structure of systems that are built concretely in this study. Each system has the restriction rules on locations and coloration, interactive evolutionary computation to enable users to create designs with the systems to process Kansei information, and interface with virtual reality to make users enjoyable to cooperate with the systems.

In chapter 3 and 4, the details of two systems representing planning challenges that should contain art and engineering are shown. A series of experiments indicates that the systems are useful in helping users in intellectual endeavors and the users can enjoy creative sophisticated designs reflecting individual Kansei needs without technical knowledge and experiences.

Chapter 5 is the conclusion of this dissertation, and summarizes the above-mentioned results.