

A Study on CAD System based on Designers' Intention Model for Machine Design

March, 1993

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The importance of cooperative design and modification design has been increased in machine design because of realizing highly functional requirement and short life cycle of products. Designers' intention is modelled that is the core information in the communication among designers. And design process description language (DPL) which supports trial-and-error design process with use of designers' intention model is proposed to describe the design process. CAD system based on both designers' intention model and DPL is developed.

The developed CAD system realizes the cooperative and modification design cycle as follows. (1) Product model and designers' intention model are automatically constructed from DPL description based on the actual design process. (2) Designer can understand the intention of other designers with use of product model and designers' intention model. (3) Designer may modify the designers' intention model in a user friendly way for the modification and addition in the design process. (4) The modified DPL description and product model are automatically generated from the modified designers' intention model.

In order to connect geometric elements which play the important role in machine design with designers' intention, "shape feature designated by designers' intention to satisfy the requirement" as proposed. The shape feature is designated by the topological and geometrical conditions to satisfy the required functions, that is described by the designers with use of DPL and geometric model interface. The developed CAD system maintains the correspondence between required functions and shape features in the cooperative and modification design. When the required function can not be realized, the system detects it and the warning is given by the system for the re-modification.

The developed CAD system based on the proposed designers' intention model and DPL supports the cooperative and modification design effectively by maintaining the functional requirements to the shape features.