

Abstract

Some basic rules must be followed when designers deal with designing process. The rules are thought as designers' knowledge of design. It is an important basis of design. When researchers try to explain the behavior of designers or to simulate the designing process using computer programs, they bring up many different models about designs from different viewpoints. These models also have the matching organizational structures of design knowledge. These organizational structures are called "Knowledge Representation".

As for in the field of computer simulation, F-B-S model can actually be operated can explain many real behaviors of designs. While we observe the operation of F-B-S model in depth, we can discover that the operation mainly depends on the inner design knowledge of F-B-S model. This inner knowledge is named "Design Prototype" by F-B-S model. The inner knowledge is very important in F-B-S model, but with the outer environmental factors there are only a few parameters to affect the operation of F-B-S model. In fact, the design can change with the environment, which is actually a variable factor in designing process. Therefore, we must think about adding the variable environmental factor into F-B-S model to produce a more reasonable designing process.

Both human designers and computer F-B-S model used to regard the design elements as different objects. It implies the concept of the hierarchy structure. General designers usually use such concept in their design unconsciously. So I introduce the concept of the hierarchy structure to construct computer-aided-design simulation system. The system will integrate the outer environmental factors and the inner design prototype into a knowledge representation system to make up for the insufficient portion of F-B-S model.

This research is aimed only at the organizational structure of knowledge representation. To establish a complete knowledge representation system, the issues such as "the real-time interaction between design prototypes" and "the designer's definable ability about design prototype" must be addressed and investigated.

Key words: knowledge representation, F-B-S model, design prototype, object, hierarchy structure