APPLICATION OF FENG SHUI KNOWLEDGE TO PRELIMINARY DESIGN EVALUATION USING KNOWLEDGE-BASED EXPERT SYSTEMS APPROACH

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DECLARATION

I hereby certify that the work embodied in this thesis is the result of original research and has not been submitted for a higher degree to any other University or Institution.

(Signed) .....

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ABSTRACT

Feng Shui, which translates as "wind" and "water", is a body of ancient Chinese knowledge for improving the relationship between environment, buildings and people. The "Form School" is the most dominant approach that has had a great impact on Chinese architectural theories and practices. In the 19th century, Western scholars first classified Feng Shui as a mixture of superstition, religious sentiment, and observational science. However, since the 1970's, Western scientists have changed to accept the development of a new complexity paradigm, and began to recognize that there are similarities between modern science and Eastern philosophy. Westerners sought deeper understandings of the relationships between the human and natural environments, and embraced Feng Shui as a broadly ecological and architecturally connected paradigm. However, the development of Feng Shui principles and Form School practices are complicated and there is little research into the application of Feng Shui knowledge to the built environment. Architectural design is a complex and intuitive process, and has been described as a "black-box" operation. As one of the important processes of architectural design, design evaluation concepts and systems are still in their early stages of development. Knowledge-Based Expert systems (KBES) approach is one of the Artificial Intelligent techniques that possess the potential to deal with intuitive expertise and advice. This research therefore aimed at examining the appropriateness of applying Feng Shui knowledge to design evaluation at preliminary design stages through the representation of Feng Shui knowledge in a structured framework and the development of a prototype model using KBES approach.

Based on the literature review and the domain expert advice, a hierarchical structure of the Feng Shui knowledge was derived from the four fundamental concepts of Form School approach. A conceptual framework of design evaluation was first established and then evaluated by practicing architects through a postal questionnaire survey conducted in Sydney and Hong Kong. Based on the survey results, the rankings of design criteria and refinement of design conditions were used in the design process of the prototype model. This KBES prototype model, called Feng Shui Expert Evaluator (FSEE) for the design evaluation of residential buildings at preliminary design stages applied to Sydney area, was developed using VP-Expert shell program. The FSEE prototype model has been verified by consistency and completeness checking, and validated by Turing test and Face validation. Results of the research indicated that it is appropriate to apply Feng Shui knowledge to evaluate residential building design at preliminary design stages and the FSEE prototype model is particularly useful in evaluating design objectively and providing a tool for staff training.