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Learning about User Interface Design through the use of User Interface Pattern Languages

A thesis dissertation presented in partial

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Abstract

The focus of this research is to investigate the potential of user interface (UI) pattern languages in assisting students of Human Computer Interaction (HCI) to learn the principles of UI design.

A graphical representation named a UI-pattern model was developed. It arose from the evaluation of four existing pattern languages. The UI-pattern model is an enhanced form of UI pattern list that represents a specific UI. It was recognised that the UI-pattern model has the potential to help students learn about pattern language structure. It was also realised that UI-pattern modelling can be used to incrementally improve pattern languages through the generative process proposed by Alexander (1979). A UI pattern language Maturity Model (UMM) has been developed. This model can be used by educators when selecting and/or modifying existing UI pattern languages so that they are more appropriate for student use.

A method for developing detailed UI designs that utilises a UI pattern language has been developed with the aim of providing students with an 'authentic' real-world UI design experience, as envisaged by constructivist educational theory (Jonassen 1999). This UI design method (TUIPL) guides the students' development of user interface conceptual models. To establish the authenticity of TUIPL three case studies were undertaken out with developers who had differing levels of UI design experience.

A series of studies investigated how HCI students used TUIPL to guide the development of UI-pattern models and canonical abstract prototypes. The studies also ascertained the students' views on using three different forms of UI pattern (illustrated, narrative and diagrammed). Data was collected by observation, questionnaires and completed exercises. The results indicate that the students developed an understanding of pattern language structure, were positive about their experience building UI-pattern models and canonical abstract prototypes, and that patterns aided communication. The learning outcomes were encouraging and students responded positively to using a UI pattern language.

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Finally I wish to dedicate this thesis to my parents Joan and Jim. For my father who wished he had attended university but died far too young and did not attain that goal. And to my mother who kept the vision alive for me, encouraging both myself and my sister to attain the best we could achieve.

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