

Model-based intelligent user interface adaptation: challenges and future directions

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Resumen Adapting the user interface of a software system to the requirements of the context of use continues to be a major challenge, particularly when users become more demanding in terms of adaptation quality. A considerable number of methods have, over the past three decades, provided some form of modelling with which to support user interface adaptation. There is, however, a crucial issue as regards analysing the concepts, the underlying knowledge, and the user experience afforded by these methods as regards comparing their benefits and shortcomings. These methods are so numerous that positioning a new method in the state of the art is challenging. This paper, therefore, defines a conceptual reference framework for intelligent user interface adaptation containing a set of conceptual adaptation properties that are useful for model-based user interface adaptation. The objective of this set of properties is to understand any method, to compare various methods and to generate new ideas for adaptation. We also analyse the opportunities that machine learning techniques could provide for data processing and analysis in this context, and identify some open challenges in order to guarantee an appropriate user experience for end-users. The relevant literature and our experience in research and industrial collaboration have been used as the basis on which to propose future directions in which these challenges can be addressed.