

Authoring of Adaptive Hypermedia

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ABSTRACT

This paper briefly describes the important topic of Authoring of Adaptive Hypermedia that is central to this Special Issue especially from the point of view of education, as well as the papers selected and the reason for this selection. The papers are based on selected, invited papers of the second Workshop on Authoring of Adaptive and Adaptable Educational Hypermedia at the Adaptive Hypermedia conference (AH'04), Eindhoven, The Netherlands, but went through a separate review process for this Special Issue.

Keywords

Adaptive educational hypermedia, Authoring, Adaptive course composition tools, Personalisation, Taxonomy

Introduction

Adaptive Hypermedia (Brusilovsky et al., 1993) combines regular hypermedia with user-modelling based adaptation. Adaptive Educational Hypermedia (AEH) (Beaumont & Brusilovsky, 1995) aims at enhancing online educational environments with personalization: a student should only receive the material that is appropriate for him/herself, according to various criteria such as knowledge, age, sex, learning preferences and styles, cognitive style, handicaps, etc. Personalization can be done via *adaptability* – thus predefined at the moment the student ‘enters’ the course, or explicitly makes choices (e.g., via a questionnaire, quiz, etc.) – or via *adaptivity* – which is a dynamic type of adaptation, that changes during the interaction process with the student (Oppermann, 1992).

Presently, adaptive (educational) hypermedia is at the point of break-through from academic circles to industry, attracting more and more business partners willing to invest in the new trend of personalized information retrieval and presentation.

Therefore, the time is ripe to move from the current proof-of-concept type of research to the wide-range, scalable implementations (Cristea & De Bra, 2002). For this purpose, it is necessary to give much more attention to the authoring process itself, as it has been shown that authoring for adaptive environments differs substantially from authoring for static ones (Cristea, 2003).

In fact, authoring for adaptive (educational) hypermedia means initially creating the resources, labelling them, combining them into what is known as (in adaptive hypermedia) a *domain model*. Then, another (not necessarily successive) step is creating a *user model*, responsible for characterizing the user, either in a static way (which generates adaptable material) or in a dynamic way (for adaptive material). More advanced adaptive hypermedia systems dedicated to education also add a *pedagogic model*, and sometimes a *presentation model*.

Summarizing, we can say that the more different aspects enter the adaptation and personalization process, the more aspects (or personal ‘points of view’) of the AH material have to be created by the author. Sometimes, this happens via different models and tools, classically however, these aspects are intertwined. The latter happens due to the fact that most authoring tools up to now have been system-specific, dedicated to a certain delivery platform.

In order for these adaptive systems to be economically viable and acceptable for potential clients, the authoring process has to be simple, yet efficient, systematic, role-oriented, with clear semantics and transparent (across systems, a similar ‘feel’ should be kept, in the sense that similar decisions should yield similar results). Only in this way, educators, for instance, can safely become adaptive educational hypermedia authors, without needing programming skills or excessive training.

This special issue brings together papers based on the Second International Workshop on Authoring of Adaptive and Adaptable Educational Hypermedia, hosted by the Adaptive Hypermedia 2004 conference in Eindhoven, The Netherlands.

The remainder of this editorial will describe the major themes of the workshop and how these are treated by the selected papers and finally draw some conclusions.

Major Themes and Special Issue Papers

The major themes of this second workshop in the series are presented on the leftmost column of the following table, whilst the papers are presented in the first row. The table shows the coverage of the topics by the selected papers, as follows:

- Papers that are dedicated mainly to that theme/ topic are marked with ⊕.
- Papers that only treat the subject superficially are marked with ✓.

In this way, a quick overview of the central focus of the paper collection is possible.

Table 1. Themes and Papers

Theme \ Paper	Dagger et al.	Retalis & Papasalouros	Armani	Alfonseca et al.	Guzman et al.	Brown et al.
Design patterns for adaptive educational hypermedia		⊕	✓			✓
Authoring patterns in adaptive/adaptable educational hypermedia		✓		✓		⊕
Authoring Tools for adaptive/adaptable educational hypermedia	⊕	✓	⊕	⊕	⊕	✓
Connecting adaptive educational hypermedia with cognitive/learning styles	✓					⊕
Collaborative issues for adaptive/adaptable educational hypermedia	✓					✓
Adaptation model transformations between adaptive educational hypermedia systems				✓		
Evaluation of authoring tools for adaptive educational hypermedia	✓		✓	⊕		
Evaluation of adaptive educational hypermedia design patterns			✓		✓	
Evaluation of adaptive educational hypermedia authoring patterns						

The themes here follow those of the previous workshop. Best practices for AEH are dropped in favour of Authoring Tools for AEH. Therefore, the papers selected for this special issue are centred around the main themes of the workshop, with special focus on already *developed systems & tools*.

In the selection process, of special help were the workshop participants, who selected the best papers which were then invited to submit extended versions for this special issue. The winning team was that of Dagger et al. (this issue), due to their strong pedagogical orientation in design and implementation of their authoring tool for adaptive educational hypermedia.

Conclusion

Compared to the papers of the first workshop and special edition (Cristea, 2004), which were more concerned with design and patterns, these papers are *authoring-system* oriented; moreover, they often either mention or actually describe *evaluation* of the authoring or design process, showing that slowly, the field of authoring is advancing.

Design and authoring is still represented with two papers: Retalis & Papasalouros with a generic view; Brown et al., concentrating on learning styles and their application as patterns.

It is interesting and important to note that the new tools take into consideration existing design specifications and patterns, even if, in some cases, only post-factum. The major center of gravity is system building, although in this case it refers to authoring systems and not delivery systems for adaptive educational hypermedia. Some great collection of examples of new or enhanced authoring systems are presented, based on a wide range of principles and authoring needs: pedagogically-oriented authoring in Dagger et al., visual authoring in Armani, authoring of computer-assisted assessment with free-text answers in Alfonseca et al. and authoring for adaptive testing as in Guzman et al.

Finally, we hope that the readers will enjoy reading these papers. For more information about the topic, please refer to the papers of the first two workshops, as well as visit the 3rd workshop in the series, that will take place at the AIED'05 conference in Amsterdam, The Netherlands.

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