



Preface

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This is the Ten Year Anniversary Issue of *User Modeling and User-Adapted Interaction* (UMUAI). Following the common practice of anniversaries, the Editorial Board decided to celebrate the journal's decennium only after the tenth year is over and not already when it has just begun. (In this way, we also avoided overshadowing the millennium festivities whose timing was not as thoughtfully chosen.)

Tremendous changes have occurred since the journal's inception in 1991. While back in these days User Modeling was still a very small academic discipline with about 300 active researchers, the field has since become mainstream. As a research area, User Modeling now has its own bi-annual conference series and a coordinating stewardship organization (<http://www.um.org>, <http://www.um.org/conferences.html>). As a technology, user modeling has become a standard in many areas of basic and applied research, as well as recently in commercial systems. Application areas include educational and tutorial systems, e-commerce applications, consumer guides, mobile systems, universal access interfaces, and many more (see Sandra Carberry's special issue on Deployed User Modeling in UMUAI 9:2–3 for a survey of some application-oriented work). Under the term "personalization", a whole small industry has developed that recently established its own advocacy organization (<http://www.personalization.org>).

Naturally, our journal has also changed considerably over the past decade. Both its official scope and its editorial board were enhanced several times during this period to cater to the increased number of application areas for which user modeling became relevant. While in the first few years research contributions were very much focused on user modeling methods, there is now more of a balance between the development of methods and their application in various areas. While in the early and somewhat AI-ish days journal reviewers were pleased if authors not only described a theory but also a (partial) implementation of this theory, they now would additionally want to see an empirical verification of user benefits when this theory becomes applied (look for David Chin's and Martha Crosby's forthcoming UMUAI special issue on the empirical evaluation of user models). And last but not least, the journal's cover design was also found to look a bit dated. This issue is the first to feature the new cover.

When the journal was founded, there was a noticeable division between user modeling research carried out in the Artificial Intelligence community (specifically in Natural-Language Dialog Systems), in Intelligent Tutoring Systems, and in

Human-Computer Interaction. Probably not the least due to the interdisciplinary character of UMUIAI, this distinction has since become very blurred. UMUIAI recently turned out to be the second-most cited journal in the Proceedings of the Artificial Intelligence in Education conference series, even though this area has its own journal. Also in last year's Adaptive Hypermedia and Adaptive Web-Based Systems Conference (that will be turned into a conference series as well) UMUIAI was the most frequently cited journal.

In the present Tenth Anniversary Issue, UMUIAI editorial board members (together with co-authors of their choice) present their views on progress in their respective areas of expertise over the past 10 years, on results that have been achieved, on expectations that have or have not been fulfilled, on failures that have occurred, and on realistic and speculative goals that may be achieved in the years to come. The issue is not meant to give a comprehensive overview of the whole field of user modeling and user-adapted interaction, but rather to highlight developments in a number of subareas that the Editorial Board considers important. All articles were subject to an open peer review within the editorial board.

The papers can be roughly divided into ones that are somewhat more focussed on user modeling methods and then ones that are more oriented towards the application of these methods.

In the first article, Ingrid Zukerman and David Albrecht describe *Predictive Statistical Models for User Modeling*. In the following related paper, Geoffrey Webb, Michael Pazzani and Daniel Billsus give an overview of *Machine Learning for User Modeling*. While Zukerman and Albrecht survey important predictive statistical methods that have been applied in user modeling and discuss recent comparative studies, Webb et al. focus on the history of research in this area and describe four challenges to machine learning that have hitherto hampered its application in user modeling. Machine learning for user modeling lay dormant for nearly a decade but is now enjoying enormous popularity due to the fact that it mostly does not presume a resource-intensive knowledge acquisition process to make predictions about the user, as is the case for traditional knowledge-based user modeling methods. This is of great advantage in application areas where the knowledge to be represented would be enormous (like in information retrieval and filtering applications that comprise large domains) or difficult to specify.

In another method-oriented article, Sandra Carberry describes *Techniques for Plan Recognition* for the purpose of assisting users better. She discusses classical plan recognition techniques as well as more recent work on dealing with ambiguity and robustness, and on the acquisition of domain knowledge through machine learning.

Since the early days of user modeling, researchers attempted to condense basic user modeling methods into domain-independent *Generic User Modeling Systems*. In his article with the same title, Alfred Kobsa discusses the early history of user modeling shell systems, the academic developments of the early 90's, and recent

commercial systems. He also speculates on future developments and research avenues.

The set of more application-oriented papers starts with an article by Gerhard Fischer on *User Modeling in Human-Computer Interaction*. He first discusses the changes in HCI over the past 15 years and a number of problems where user modeling can provide assistance. He then reviews several user modeling approaches for HCI purposes and presents research challenges for the future.

The article by Peter Brusilovsky is concerned with *Adaptive Hypermedia*, which have recently enjoyed enormous popularity due the advent of the World Wide Web. Personalized hypermedia has been employed for educational systems, e-commerce applications, for information systems, handheld guidance systems, and other applications. Brusilovsky reviews and systematizes the developments of the past four years and outlines future research trends.

Judy Kay's article is concerned with questions of *Learner Control* in educational systems, i.e. the extent to which learners should have control over the learning process including the learner model that the system develops about them. The paper discusses several issues when shifting to greater learner control, with a focus on the implications for learner modeling.

Ingrid Zukerman and Diane Litman present an article on *Natural Language Processing and User Modeling: Synergies and Limitations*. They review the contributions of user modeling to Natural Language Generation, in particular content planning, the role of plan recognition and of the analysis of linguistic surface features as a means for acquiring assumptions about the user, and a number of user modeling issues in natural-language dialog systems.

Constantine Stephanidis is concerned with *Adaptive Techniques for Universal Access* in Human-Computer Interaction. The use of user modeling and personalization techniques for facilitating and improving the access to computer systems for all users (including e.g. people with disabilities and elderly users) is relatively new. Stephanidis demonstrates with numerous examples from several European projects that this approach is feasible, but needs to be taken into account from the early phases of conception and design.

The final article by David Chin is about the *Empirical Evaluation of User Models and User-Adapted Systems*. He reviews past user modeling research that involves empirical evaluation and gives very practical advice to readers on how empirical experiments should be designed and conducted. As mentioned above, the empirical validation of user benefits as a result of personalization has considerably increased in importance over the last few years. According to Chin, the most recent four years of UMUAI articles contain almost twice as many articles with empirical evaluations as the first four years.

User Modeling and User-Adapted Interaction continues to be committed to serving researchers and professionals with scientific reports of the highest quality on the tailoring of technical systems to users' individual needs, and the role of user models

in this context. Considering the dynamic energy that is present in this research area even after more than 20 years from its inception, we expect that UMUAI will continue to change in the ten years to come. After all, continuous adaptation to current needs is the central mission of the journal.

Author's vita

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