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Preface

Special Issue on User Modeling and Personalization for Television

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The technology provided by today's set top boxes challenges viewers by allowing access to hundreds of simultaneous programs of varying interest to individuals. Electronic program guides (EPGs) provide more and more information to users, but most find it challenging to search this information in real time for what interests.

A promising approach to prevent users from 'being lost in TV program space' is to enable electronic program guides and set top boxes to track their viewing behavior, to make assumptions or compute inferences about their interests and preferences, and to use this to tailor TV offerings to their needs. Fundamental challenges that must be addressed to enable personalized television include:

- *Viewer Modeling*: The acquisition, representation, and utilization of information about viewers, such as their properties (e.g., gender, age), preferences, interests, beliefs, and their viewing behavior. This could include individual and groups of users.
- *Program Processing*: The automated identification, indexing, segmentation (e.g., into components, stories, commercials), summarization, and visualization of television programs, such as interactive documentaries.
- *Program Representation and Reasoning*: Representing the general characteristics and specific content of programs and shows, including the possible segmentation of programs in parts. Reasoning about what may make one program similar or dissimilar to others. This can include a range of techniques, including recommender techniques such as collaborative filtering (e.g., finding unseen programs that others with similar preferences have enjoyed), content analysis, clustering, and data mining.
- *Presentation Generation and Tailoring*: The selection, organization, and customization of television material based on viewer queries, processed programs, and viewer models.
- *Interaction Management*: The design and development of methods of human computer interaction for television, including mechanisms for attention and dialogue management.
- *Evaluation*: The assessment of the benefits for users, including measuring the precision of the techniques to model the TV viewer's preferences, the precision and recall associated with the ability of users to find programs they care to watch,

the speed and accuracy with which adaptation can be performed, the users satisfaction with the process and result, and the (real or perceived) cognitive load the system places on the user.

This special issue collects leading research on some of these fundamental challenges. The first article by O' Sullivan, Smyth, Wilson, McDonald, and Smeaton addresses the problem that viewer profiles are typically sparse. This has negative effects on the reliability of collaborative filtering approaches, which rely on overlap of user ratings. The authors describe how to enhance the quality of EPGs by supplementing ratings-based profile knowledge with item-similarity knowledge that is automatically discovered by mining user profiles. The authors support their claims by presenting an extensive evaluation involving two large-scale, online systems: the PTVPlus, a personalized TV listings portal, and Físchlár, an online digital video library system.

The second article by Hara, Tomomune and Shigemori presents an analysis of the TV shows that more than 1,600 randomly chosen Japanese TV viewers watched during a given week. After grouping users on the basis of actual program choice, the authors analyzed the features of these groups and discovered that program selection is dependent upon characteristics of programs, such as their seriousness and categorization. The authors develop eight viewer groups (stereotypes), which explain viewer television contact, motivation for choosing programs, and interest in matters other than television.

While the focus of the first articles is on targeting individual viewers, the third article by Masthoff addresses the choice of programs that are interesting for groups of viewers, based on models of individual viewer preferences. She discusses a number of possible selection strategies, inspired by Social Choice theory (e.g., averaging utilities, averaging them without causing misery to any one viewer, and minimizing everyone's misery). A first experiment investigating human selections found that humans care about fairness and avoid individual misery when selecting sequences of items for a group to watch. A second experiment assessing viewer satisfaction with the results of various selection strategies found that one strategy (namely Multiplicative Utilitarianism) gave satisfaction to all individuals in the group according to all subjects. Finally, in a third experiment, the author found that viewing an item can influence the ratings of other items, with a possible effect of both the mood induced by the viewed item and the topical relatedness of the items.

The final article by Maybury, Greiff, Boykin, Ponte, McHenry and Ferro introduces the concept of personalcasting. The authors transform news video intended for stereotypical users into individualized presentations by integrating video segmentation, video information extraction, user modeling and tailored presentation generation. The authors describe the Personalized Broadcast News Navigator (P-BNN), which detects users' content and media preferences based on their explicit and implicit actions while they search and browse interactive video news. The authors also report how query expansion and interactive feedback enhances the relevance of delivered content. An empirical study of users explored the value of the approach which offers more

fine-grained content tailoring than current personalized program-level recommenders for TV, and does not rely on externally provided program metadata.

Taken collectively, the articles in this special issue illustrate the challenge and value of personalized television. While the methods presented will not improve underlying television content, they can help viewers find content that is more relevant to their interests. We hope that readers find value in these articles and that eventually we all benefit from more effective television.

Curriculum Vitae of the Guest Editors

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Dr. Maybury is Executive Director of the Information Technology Division at The MITRE Corporation and Executive Director of the ARDA Northeast Regional Research Center. Dr. Maybury received his B.A. in Mathematics from the College of the Holy Cross, an M.Phil. in Computer Speech and Language Processing from Cambridge University, England, an M.B.A. from Rensselaer Polytechnic Institute and a Ph.D. in Artificial Intelligence from Cambridge University, England. Dr. Maybury has authored over fifty technical articles.

He is editor of *Intelligent Multimedia Interfaces* (1993), *Intelligent Multimedia Information Retrieval* (1997), *New Directions in Question Answering* (2004), co-editor of *Readings on Intelligent User Interfaces* (Morgan Kaufmann Press, 1998), *Advances in Text Summarization* (1999) and *Advances in Knowledge Management* (1999) and co-author of *Information Storage and Retrieval* (2000).

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Dr. Liliana Ardissono is an Associate Professor at the Computer Science Department of the University of Torino. She received her degree in Computer Science in 1991 and her Ph.D in Computer Science in 1996.

Since 1997, she has been working in the area of intelligent user interfaces and adaptive hypermedia, focusing on user modeling and personalization for the customization of Web-based systems and services for Digital TV. She has recently extended her research interests to the design and development of techniques for the management of user-adaptive ubiquitous services. She has also been active in the intelligent agents and Multi-Agent Systems area, focusing on the design and development of multi-agent architectures supporting personalized, ubiquitous services. Dr. Ardissono over seventy technical papers published at international conferences and in journals.