Guest editorial

Human behavior analysis for library and information science

Introduction

This special issue investigates the topics of human behavior analysis, data mining, and ambient intelligence technologies in library and information sciences. It is considered one of the most important issues to investigate the interaction between librarians and technology. Recently, the emerging technologies like Internet of Things, big data, and deep learning technologies, along with the public's embracing of wireless sensor networks generates new opportunities for situation-aware library systems and services. The realization of big data covers the main kernel of database management technology, giving rise to the development of raw data gathering, data preprocessing, data warehouse, specific hardware devices, computer clouds, parallel processing techniques, and data mining. Compared to traditional library systems and services, a situation-aware, computing-based library application has the advantage of changing from the on-spot experiences to the mobile and ubiquitous environment.

Many challenges, however, must be addressed for the development of consistent, suitable, safe and flexible real-time library and information systems. Deficiencies in human behavior analysis and situation-aware care may raise issues in the collection of streamed data. The analysis and use of such data refers to as social mining, web mining and sentiment mining, the last of which has recently become highly popular. Situation-aware technology involves the creation of smart spaces and this technology can be applied to systems that handle information retrieval, recommendations, trust, agent behavior, environmental conditions and changes and security, etc., and the surrounding issues have important implications to library and information science.

Fewer research questions, diverse fields

Human behavior analysis refers to the interaction between individual and technology to the existence of individuals. They are usually hidden in our daily living environments, and are situation awareness, personalized, and adaptive in the environment. In this issue, authors provided more particular and more diverse objectives. These papers can be grouped into three major fields.

The first field describes the "Learning behavior." In this special issue, Wu *et al.* (2018) use Kolb's learning style theory and investigate the learning effectiveness of user's different learning style (including accommodators, divergers, convergers, and assimilators) on web-based learning system. In addition, Bhardwaj and Kumar (2018) present a detailed investigation of visually impaired students' problems, and how the proposed approach can be useful to evaluate the digital infrastructure and services. Lin and Huang (2018) evaluate the students' learning achievement based on flow experience and AR technique in U-learning environment. Finally, Tsai and Tang (2018) adopt blended problem-based learning method to apply into university biotechnology courses and evaluate the relationship between learning attitudes and learning achievement.

The second field focuses on "Context-aware and intelligent system." In this special issue, Liao and Chang (2018) propose the context-aware annotation system for Hakka culture-specific language learning in the U-learning environment. Besides, Bouchrika *et al.* (2018) adopt the technology-to-performance chain model to evaluate the relationship between the perceived performance, software usability, and attitude to use the online educational system. Finally, Sangaiah *et al.* (2018) figure out the global optimization and intelligent system issues and also compare the performance for cuckoo search and flower pollination algorithm.

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Researches in the third and last field investigate the "social mining" and "text mining." Spruit and Buijs (2018) provide the asynchronous social search method to build the single point of information access. Hajek and Stejskal (2018) use the questionnaire survey method to collect the experimental data and disclose the users' economic preferences. Then, it is useful to understand users' behavior and can be a reference for librarian to do the right decision making. In the bibliometrics and informatics research, Huang *et al.* (2018) use citation and co-citation analysis, and social network analysis to identify the linkages among different publications and confirm scholars' status and positions for the specific research contributions. After that, Lytras *et al.* (2018) choose USA as a primary scientific knowledge producer and then cluster the scientific publications outputted by the USA into other thematic areas. The main search approaches are including keywords, paper titles, author-defined keywords, and abstract from these publications. Daud *et al.* (2018) present a supervised learning framework and compare the SVM, NB, and ID3 algorithms to handle the reciprocal link prediction by using paper, author, and field of research features. Yen and Abdar (2018) present the crowd preference and confidence mining methods by applying PFS, NNMLP and RMRate algorithms to analyze the sharing economy data. Finally, Quan *et al.* (2018) use two visual analysis tools and choose the topics and headings as the text signals to navigate long document. In addition, they also examine the reading behavior by using the text signals and evaluating the reading effectiveness.

Conclusion

This special issue explores the use of information technology to perform human behavior analysis in library and information science. These submissions of original works based on interdisciplinary research (e.g. computer science and humanistic disciplines such as sociology and anthropology). This issue also covers both technological and non-technological issues related to these rapidly growing and evolving areas. Finally, this special issue receives a large number of submissions and it finds out the users' behaviors and adoption with context-aware, social mining, and text mining technologies have become important issues for library and information science research.

Mu-Yen Chen
Department of Information Management, National Taichung University of Science and Technology, Taichung, Taiwan

Edwin David Lughofer
Department of Knowledge-Based Mathematical Systems, Johannes Kepler University Linz, Linz, Austria

Neil Y. Yen
School of Computer Science and Engineering, The University of Aizu, Aizu-Wakamatsu, Japan, and

Chia-Chen Chen
Department of Management Information Systems, National Chung Hsing University, Taichung City, Taiwan

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