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Hong Va Leong (Eds.)

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# Advances in Web-Age Information Management

7th International Conference, WAIM 2006  
Hong Kong, China, June 2006  
Proceedings



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# Advances in Web-Age Information Management

7th International Conference, WAIM 2006  
Hong Kong, China, June 17-19, 2006  
Proceedings

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## Preface

The rapid prevalence of Web applications requires new technologies for the design, implementation and management of Web-based information systems. WAIM 2006, following the past tradition of WAIM conferences, was an international forum for researchers, practitioners, developers and users to share and exchange cutting-edge ideas, results, experience, techniques and tools in connection with all aspects of Web data management. The conference drew together original research and industrial papers on the theory, design and implementation of Web-based information systems. As the seventh event in the increasingly popular series, WAIM 2006 made the move towards internationalization by migrating out of mainland China into Hong Kong, the Oriental Pearl, and the cultural junction and melting pot between the East and the West. It was successful in attracting outstanding researchers from all over the world to Hong Kong. These proceedings collected the technical papers selected for presentation at the 7th International Conference on Web-Age Information Management, held in Hong Kong, on June 17–19, 2006.

In response to the call for papers, the Program Committee received 290 full-paper submissions from North America, South America, Europe, Asia, and Oceania. Each submitted paper underwent a rigorous review by three independent referees, with detailed referee reports. Finally, 50 full research papers were accepted, from Australia, China, Germany, Hong Kong, Japan, Korea, Macau, New Zealand, Singapore, Spain, Taiwan, the UK and USA, representing a competitive acceptance rate of 17%. The contributed papers addressed a broad spectrum on Web-based information systems, ranging from data caching, data distribution, data indexing, data mining, data stream processing, information retrieval, query processing, temporal databases, XML and semistructured data, sensor networks, peer-to-peer, grid computing, Web services, and Web searching.

We were extremely excited with our strong Program Committee, comprising outstanding researchers in the WAIM research area. We would like to extend our sincere gratitude to the Program Committee members and external reviewers.

Last but not least, we would like to thank the sponsor, for their strong support of this conference, making its every success. Special thanks go to The Chinese University of Hong Kong, City University of Hong Kong, Hong Kong Baptist University, The Hong Kong Polytechnic University, The Hong Kong University of Science and Technology, The University of Hong Kong, Hong Kong Web Society, IEEE Hong Kong Section Computer Society Chapter, and Hong Kong Pei Hua Education Foundation.

June 2006

Jeffrey Xu Yu  
Masaru Kitsuregawa  
Hong Va Leong

## Message from the Conference Co-chairs

It is our great pleasure to welcome you to WAIM 2006. At age 7, WAIM was ready to reach new heights. This year, WAIM featured a couple of new initiatives. We added two accompanying workshops, one co-chaired by Hong Va Leong and Reynold Cheng and the other co-chaired by Lei Chen and Yoshiharu Ishikawa. A project demo session, organized by Joseph Ng, was introduced so that conference participants could get their hands on the research prototypes and interact directly with the researchers who developed them.

With the help of a dedicated PC, Jeffrey Yu and Masaru Kitsuregawa put together an excellent technical program, including three inspiring keynote speeches by leading experts in the field. In addition to the paper sessions, we had a rich tutorial program, put together by Wang-Chien Lee and Frederick Lochovsky, and a panel that was carefully selected by Kamal Karlapalem and Qing Li to reflect timely research issues relevant to this region.

Besides the technical program, WAIM 2006 would not have been successful without the hard work of many members of the Organizing Committee. Hong Va Leong, the Publication Chair, was responsible for the negotiation and logistics for the publication of the proceedings you are reading. Xiaofeng Meng, Huan Liu and Arkady Zaslavsky helped to publicize WAIM 2006 in four key regions, Asia, USA, Australia and Europe.

We need to thank Joseph Fong for securing the sponsors for the conference and Vincent Ng for carefully managing the budget. Robert Luk and Ben Kao, the Local Arrangement Co-chairs, working with the office staff at the Hong Kong Polytechnic University, Department of Computing, arranged the conference site and social activities to give the conference participants an enjoyable experience during the conference and pleasant memories to bring home.

Last but not least, the six universities in Hong Kong and the Hong Kong Web Society provided both financial and moral support to WAIM 2006. Additional major funding was received from Hong Kong Pei Hua Education Foundation Limited and IEEE Hong Kong Section Computer Society Chapter. Their generosity is much appreciated.

June 2006

Dik Lun Lee and Wang Sang

# Organization

WAIM 2006 was jointly organized by The Chinese University of Hong Kong, City University of Hong Kong, Hong Kong Baptist University, The Hong Kong Polytechnic University, The Hong Kong University of Science and Technology, and The University of Hong Kong, and was hosted by the Department of Computing, The Hong Kong Polytechnic University.

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