

Hee Yong Youn
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Hiroyuki Morikawa (Eds.)

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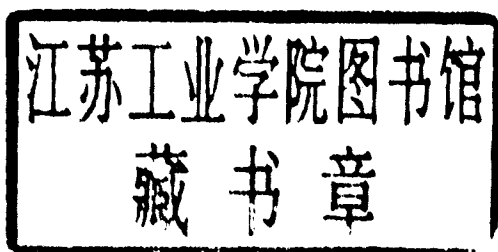


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Preface

We cordially welcome you to the proceedings of the 2006 International Symposium on Ubiquitous Computing Systems (UCS) held in Seoul, Korea. UCS has been a symposium for dissemination of state-of-the-art research and engineering practices in ubiquitous computing with particular emphasis on systems and software. 2006 UCS was the third of this series of international symposia, and its importance is increasing as information technology industries are recognizing ubiquitous systems to be one of their top priorities. This year the symposium was organized by u-Korea Forum, Sungkyunkwan University, The Electronic Times, and UCN, Korea. It was also sponsored by the Korea Ministry of Information and Communication, KISS, KIPS, KICS, NCA from Korea and IPSJ SIGUBI, IEICE URON, and UNF from Japan.

This year we attracted 359 high-quality paper submissions from all over the world. Among them, 41 papers representing 11 countries were selected to be included in the technical program. This very low acceptance rate of about 11% clearly demonstrates the high quality of the conference, and this tradition will continue in the upcoming years. Three distinguished speakers were also invited for keynote speeches, who enlightened the audience on ubiquitous computing theory and application.

The technical program of UCS 2006 could achieve a very high quality through a precise and stringent review process. The Technical Program Committee consisted of 47 excellent members, and every submitted paper received at least 3 reviews. Most reviews were almost of journal paper review quality, and the paper selection made via Web conferences for several days was very serious and strict. This greatly contributed toward a high-quality program, and at the same time, enhance of the quality of each respective paper submitted.

Along with the symposium, we also offered a poster session. This was for emphasizing the practical aspect of ubiquitous issues in real-world problems, especially in computing and communication. It provided the researchers and engineers with opportunities for sharing their ideas and solutions of various challenging problems in this area.

The city of Seoul is a mega-center of academia/industry for various areas of information technology. It also houses a variety of cultural and modern settings. Therefore, the participants of UCS were able to enjoy not only an interesting technical program but also a unique metropolitan atmosphere.

As General Co-chairs and Program Co-chairs, we would like to extend our appreciation to all those who took part in the symposium: the Steering Committee, Organizing Committee, Program Committee, the authors, and the reviewers. Special thanks go to Minsoo Kim from Ajou University, Korea for preparation of the proceedings and Suhee Kim from u-Korea Forum for taking care of all the chores.

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A Rule-Based Publish-Subscribe Message Routing System for Ubiquitous Computing

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Abstract. The ubiquitous computing produces big volume of messages as the pervasive computability is deployed in large scale. As a middleware between the message producer and message consumer, message routing system enables backend systems to efficiently acquire the interested message. A widely adopted message routing mechanism is the content-based publish-subscribe framework. Based on this paradigm, we propose a rule-based system for supporting message routing in ubiquitous computing. The novel system features in the flexibility of the message computing, which is accomplished through a set of message operators. The message consumer could select the appropriate operator and specify the operating rule to get satisfying messages.

1 Introduction

Message routing system is a fundamental element in the ubiquitous computing architecture. The ubiquitous computing faces the challenges promoted by the explosion of the context information. RFID technology enables the product tracking at the instance-level rather than at the class-level [1]. Sensor network which is monitoring the environment constantly reports the current data and any changes. Countless mobile devices generate huge numbers of unanticipated events. All of this information, including event and data, gathered from the physical world is defined as messages. The hardware or software which generates the message is so called the message producer. The message generated from the producer is called raw message, which flows from the message producer to the backend systems or applications to get treatment. Those systems or applications where the message sinks are called as message consumer.

However, the message generated from the message producer is usually of interest not only to a single consumer, but to a diverse set of consumers across an organization and its business partners. The message data must thus be broadcasted to the entities that indicated an interest in the data. On the other hand, common to all consumers that make use of the message is the desire to receive filtered and aggregated message rather than raw streams of message. Different consumers are