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Emerging Direction in Embedded and Ubiquitous Computing

EUC 2007 Workshops: TRUST, WSOC
NCUS, UUWSN, USN, ESO, and SECUBIQ
Taipei, Taiwan, December 17-20, 2007
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Preface

This proceedings volume contains the papers presented at the workshops held in conjunction with the 2007 IFIP International Conference on Embedded and Ubiquitous Computing (EUC 2007), in Taipei, Taiwan, December 17–20, 2007. The main aim of these workshops is to bring together academics, industry researchers and practitioners to discuss and exchange state-of-the-art research results and experience, case studies and on-going research activities in the areas of embedded and ubiquitous computing, networking and communications.

The seven workshops held in conjunction with EUC 2007 were:

1. The Second International Workshop on Trustworthiness, Reliability and services in Ubiquitous and Sensor neTworks (TRUST 2007)
2. The Third International Symposium on Security in Ubiquitous Computing (SecUbiq 2007)
3. The Second International Workshop on Embedded Software Optimization (ESO 2007)
4. The Third International Workshop on RFID and Ubiquitous Sensor Networks (USN 2007)
5. The Third International Symposium on Network-Centric Ubiquitous Systems (NCUS 2007)
6. The First International Workshop on System and Software for Wireless SoC (WSoC 2007)
7. The First International Workshop on Ubiquitous UnderWater acoustic-Sensor Network 2007 (UUWSN 2007)

Each of these workshops addressed a particular topic related to the main theme of the conference and attracted a number of quality papers that complemented the main conference. The workshop organizers formed strong Technical Program Committees that helped in selecting high-quality papers for presentation and publication in the workshop proceedings.

Several individuals contributed to the success of these workshops. In particular, we would like to thank the EUC 2007 General Chair Edwin Sha and Program Chair, Tei-Wei Kuo for their guidance and support, and EUC 2007 Steering Co-chairs, Laurence T. Yang, Minyi Guo and Jane Liu, for their guidance as well as for giving us this opportunity. Last but not least, we would also like to thank the workshop organizers for their hard work which greatly contributed to the success of this event.

December 2007

Mieso K. Denko
Chi-Sheng (Daniel) Shih

The Second International Workshop on Trustworthiness, Reliability and Services in Ubiquitous and Sensor neTworks (TRUST 2007)

Workshop Organizers

Jong Hyuk Park, Laurence T. Yang, Sandeep Gupta, Ilsun You, Kuan-Ching Li, David Chadwick, Eun-Sun Jung

Workshop Description

With the proliferation of wireless technologies, there is a fast-growing interest in ubiquitous environments (UE). UE enables one to create a human-oriented computing environment where computer chips are embedded in everyday objects and interact with the physical world. With a great potential to revolutionize our lives, UE also poses new research challenges. TRUST 2007 focused on the challenges and solutions for UE with an emphasis on trust-worthiness, reliability, and services.

In order to guarantee high-quality proceedings, we put extensive effort in reviewing the scientific papers. We received 51 papers from Japan, China, Korea, Hong Kong, Taiwan, Canada, UK, France, Italy, Norway, and USA, representing more than 50 universities or institutions. All submissions were peer reviewed by three Program Committee members. It was hard to select the presentations.

The workshop program contained 15 regular papers, which represents an acceptance rate of 29%. We congratulate the authors of accepted papers, and regret many quality submissions could not be included, due to the time limit of this program.

Our special thanks go to the Program Committee, who had the difficult task of reviewing the large number of papers in a relatively short time. Finally, we are also indebted to the members of the Organizing Committee.

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The First International Workshop on System and Software for Wireless SoC (WSOC 2007)

Workshop Organizers

Shiao-Li Tsao and ChingYao Huang

Workshop Description

Advances in system-on-chip (SoC) technologies make it possible to develop low-cost and compact-size ICs for information technology (IT) and consumer electronic products. Wireless or radio SoCs which provide wireless accesses are regarded as one of the most important categories. Successful stories such as Bluetooth, WLAN, and GSM SoCs encourage the development of SoCs for advanced wireless access technologies, and thus the research and development of advanced Wireless SoCs have attracted considerable interest from both academia and industry in recent years. Unfortunately, these advanced wireless systems, such as WiMAX and 4G, support rich applications and broadband accesses which make the SoCs very difficult to design and implement. Major issues such as the requirement development, system level model, system level design (SLD), and verification and validation for such complicated wireless SoCs need more investigations and studies. The hardware and software partitions and hardware and software co-designs of wireless SoCs are also important research topics. Embedded software is especially critical for wireless SoCs, since the system software and application software are both complicated. Code efficiency, low-power and small foot-print software are required for wireless SoCs which are usually employed in battery-operated and portable devices.

The goal of WSOC 2007 was to provide a forum for scientists, engineers, and researchers to discuss and exchange their new ideas, novel results, work in progress and experience on all aspects of system level design, HW/SW co-design, embedded software, research platforms and case studies for advanced wireless SoCs.

We selected 12 high-quality papers to be included in the WSOC 2007 program. We congratulate the authors of accepted papers. We also had two invited talks from industrial executives, who shared their experiences in designing wireless SoCs with us.

We would like to thank all the authors for their contributions to the program, the Program Committee members and external reviewers for reviewing and providing valuable comments to the submissions. We are grateful to Ken Loa from the Institute for Information Industry of Taiwan and Y.M. Yeh from Mobile Devices Inc. for their time and contributions to the invited talks. Finally, we would like to thank Chi-Sheng Shih and Mieso Denko, the EUC 2007 Workshop Co-chairs, for the guidance in the organization of the workshop.

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The Third IFIP International Symposium on Network-Centric Ubiquitous Systems (NCUS 2007)

Symposium Organizers

Laurence T. Yang, Kuan-Ching Li, Ce-Kuen Hsieh, Qing-An Zeng, Weijia Jia, Yun Liu, Hao-Hua Chu

Symposium Description

Historically, ubiquitous systems have been highly engineered for a particular task, with no spontaneous interactions among devices. Recent advances in wireless communication and sensor and actuator technologies have given rise to a new genre of ubiquitous systems. This new genre is characterized as self-organizing, critically resource constrained, and network centric. The fun-damental change is communication: numerous small devices operating collectively, rather than as standalone devices, form a dynamic ambient network that connects each device to more powerful networks and processing resources.

NCUS 2007 was the successor of the First IFIP International Symposium on Network Centric Ubiquitous Systems (NCUS 2005) held in Nagasaki, Japan and the Second IFIP International Symposium on Network Centric Ubiquitous Systems (NCUS 2006) held in Seoul, Korea. It offered a premier international forum for researchers and practitioners from both industry and academia to discuss hot topics and emerging areas, to share recent progress and latest results, and to promote cutting edge research and future cooperation on ubiquitous systems and ubiquitous networking.

We were very proud to receive 45 high-quality submissions. We conducted a rigorous peer-review process for each submission, with the great support of all Program Committee members as well as a group of external reviewers. Each paper was reviewed by three reviewers for content, accuracy and relevance to the scope of the symposium. We selected the 13 best papers out of 45 submissions in this program, representing an acceptance rate of 28.8%. These papers were classified into four major sessions.

The symposium Chairs would like to thank all the authors for their contributions and support of this symposium. We are very grateful to all the Program Committee members and other colleagues who helped us in the review process for this workshop. We are especially thankful to Chi-Sheng Shih and Mieso Denko for their support and guidance throughout the organizing process of the symposium.

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The First International Workshop on Ubiquitous UnderWater acoustic-Sensor Network 2007(UUWSN 2007)

Workshop Organizers

Soo-Hyun Park, Chang-Hwa Kim, Young-Sik Jeong, Dongwon Jeong, Laurence T. Yang

Workshop Description

Underwater acoustic sensor networks (UW-ASN) have many potential application areas such as ocean monitoring and disaster prevention. Although more than two-thirds of the earth's surface is covered with water, including oceans, rivers and lakes, the oceans remain one of the last frontiers and are a treasure trove of resources. Oceans serve as the main arteries of transportation between continents, food supplies and natural resources retrieval such as oil and natural gas. Recently, researchers UW-ASN have been trying to apply sensor network concepts to underwater environments to be used in the field such as in resource inquiry, pollution supervision and catastrophe prevention.

UW-ASN is a new area of ubiquitous sensor networks in underwater environments which has challenges to be overcome such as in the long propagation delay resulting from the low speed of sound propagation, severely limited range-dependent bandwidth, attenuation and time-varying multipath propagation. All of the above distinct features of UW-ASN give birth to new challenges in the network protocol suite.

This workshop provides an opportunity for industry and academic professionals to discuss the latest issues and progress in the area of UW-ASN. The workshop publishes high-quality papers closely related to the various theories and practical applications in UW-ASN. Furthermore, this workshop gives researchers a chance to share creative ideas regarding UW-ASN with each other and with engineers from institutions around the world.

UUWSN 2007 was the first workshop on underwater sensor networks to be held in Asia. We had more than 33 papers submitted to this workshop and each paper was carefully reviewed by the internationally organized UUWSN 2007 Technical Program Committee (TPC) – three reviewers for each paper. We selected only ten excellent papers among them, representing an acceptance rate of 30%. We congratulate the authors of accepted papers and regret that many high-quality submissions could not be included, due to the limit in session time.

We had one keynote speech concerning ocean experiments in underwater acoustic networking adding to the content of our high-quality program.

On behalf of the board of the UUWSN 2007 workshop, we appreciate all the submissions to the program. We are grateful that Joseph A. Rice (Naval

Postgraduate School, US) accepted our invitation for the keynote presentation. We would also like to thank the TPC members and external reviewers for their efforts in reviewing the submissions. Finally, we would like to thank Chi-Sheng(Daniel) Shih (National Taiwan University, Taiwan) and Mieso Denko (University of Guelph, Canada), the workshop Co-chair, for the guidance in the organization of this workshop.

This workshop was partly supported by Kangnung National University ITRC (Research Center for Ocean Sensor Network System Technology) and the MIC (Ministry of Information and Communication), Korea, under the 2007 ITRC (Information Technology Research Center) support program supervised by the IITA (Institute of Information Technology Assessment).

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The Third International Workshop on RFID and Ubiquitous Sensor Networks (USN 2007)

Workshop Organizers

Young-Bae Ko, Kang-Won Lee

Workshop Description

Welcome to the proceedings of USN 2007, the Third International Workshop on RFID and Ubiquitous Sensor Networks. This workshop was a successor of USN 2006 held in Seoul, Korea, and it tried to bring together the recent advances in RFID and sensor technologies and the researchers who are active in the field and share interest in the area of ubiquitous sensor networks. This year's program covered a wide range of topics, including such issues as RFID tag anti-collision, security, target classification, and novel application development.

The exciting program is a result of the great support from all Program Committee members as well as a group of external reviewers. Taking this opportunity, we would like to thank all the Program Committee members and the reviewers for their hard work. We would also like to thank all the authors for their contributions to the program. We congratulate the authors of accepted papers, and regret that many quality submissions could not be included, due to the time limit of this program. We are also grateful to all the members of the Steering Committee for their advice and support. Finally, we would like to thank the EUC workshop Co-chairs, Mieso Denko and Chi-Sheng Shih, for the guidance in the organization of this workshop.

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The Second International Workshop on Embedded Software Optimization (ESO 2007)

Workshop Organizers

Shih-Hao Hung and Jun Wu

Workshop Description

As embedded systems are more pervasive in our everyday lives, they have become an active research topic in recent years. The increasingly ubiquitous embedded systems pose a host of technical challenges different from those faced by general-purpose computers because they are more constrained in terms of timing, power, area, memory and other resources. The optimization of embedded software becomes a major concern for embedded system design. The goal of ESO 2007 was to provide a forum for scientists, engineers, and researchers to discuss and exchange their new ideas, novel results, work in progress and experience on all aspects of embedded software optimization.

This year we received seven high-quality submissions. We conducted a rigorous peer-review process for each submission, with the great support of Program Committee members. Based on the reviews, we selected three papers to be included in this program. In addition, four quality papers from the main conference (EUC 2007) were invited to be presented in this workshop based on the recommendation of the reviewers. We congratulate the authors of accepted papers, and regret many quality submissions could not be included, due to the time limit of this program.

Taking this opportunity, we would like to thank all the authors for their contributions to the program. We are grateful that Tei-Wei Kuo (Program Chair of EUC 2007) and Chi-Sheng Shih (Co-chair of EUC 2007 Workshops) helped us with the invited papers and the publication matters. Finally, we would also like to thank the PC members for their efforts in reviewing the submissions.

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The Third International Symposium on Security in Ubiquitous Computing (SecUbiq 2007)

Workshop Organizer

Laurence T. Yang, Zonghua Zhang, Jemal H. Abbawajy, Jong Hyuk Park, Deqing Zou, Emmanuelle Anceaume

Workshop Description

We are proud to present the proceedings of the Third International Symposium on Security in Ubiquitous Computing (SecUbiq 2007), held in Taipei, Taiwan during December 17–20.

The ubiquitous computing paradigm foresees seamless integration of communicating and computational devices and applications (e.g., smart sensors, wireless networks and mobile agents) embedded in all parts of our environment, from our physical selves, to our homes, our offices, our streets and so forth. Although ubiquitous computing presents exciting enabling opportunities, the benefits will only be realized if security issues can be appropriately addressed.

The overall aim of this symposium is to provide a forum for academic and industry professionals to discuss recent progress in methods and technologies concerning the identification of risks, the definition of security policies, and the development of security measures for ubiquitous computing.

In response to the call for papers, we received 38 papers from around the world including Korea, China, Hong Kong, Taiwan, Japan, Spain, Canada and USA, representing more than 20 universities and institutions.

In order to guarantee high-quality proceedings, we put extensive effort into reviewing the papers. All submissions were peer reviewed by at least three Program Committee members as well as external reviewers. As the quality of the submissions was quite high, it was extremely difficult to select the papers for oral presentations and publication in the proceedings of the symposium. After extensive discussion and based on the reviews, we finally decided to accept 11 papers for oral presentation and publication in the proceedings. We believe that the chosen papers and topics provide novel ideas, new results, work in progress and state-of-the-art techniques in this field as well as stimulate future research activities.

This symposium would not have been possible without the support of many people, who made it a success. First of all, we would like to thank the EUC 2007 workshop Chairs, Mieso Denko and Chi-Sheng Shih, and the Steering Committee Chair, Laurence T. Yang. In addition, we thank the Program Committee members and external reviewers for their excellent job in reviewing the submissions and thus guaranteeing the quality of the symposium under a very tight schedule. We are also indebted to the members of the Organizing Committee. Finally, we would like to take this opportunity to thank all the authors and participants for their contribution to making SecUbiq 2007 a grand success.

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