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Smart Homes and Health Telematics

12th International Conference, ICOST 2014
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Preface

It is our great pleasure to welcome you to Denver, Colorado, and to the 12th International Conference on Smart Homes and Health Telematics – ICOST 2014. This year the ICOST program offered exciting and high-quality sessions, including six technical sessions, a poster session, three keynotes from highly recognized researchers and visionary leaders in the industry in addition to two panels.

In addition to the technical program, an exciting social program was planned for all registrants. A welcome reception followed by a Gala Dinner kick-started our social program at the Denver Museum of Nature and Science on June 25. An evening of entertainment was also planned at the Denver Center for the Performing Arts, downtown Denver. Together, we enjoyed a sneak peek into the rehearsal process conducted by the Phamaly Theatre Company, as well as enjoyed musical pieces from the popular musical Joseph and the Amazing Technicolor Dreamcoat.

Putting together ICOST 2014 was a team effort. We would like to first thank the authors for submitting their best work and providing the content of the program in terms of papers and posters. We would also like to thank the panelists and the three keynote speakers for their contributions. We are grateful to the Organizing Committee and its dedication in making ICOST 2014 a success. Mounir Mokhtari provided invaluable guidance which was very helpful throughout the process. Tao Gu did a great job in assembling a world-class Program Committee for soliciting and reviewing the papers. Carl Chang did a great job guiding the process of forming the two panels in the program. Bessam Abdulrazzak did a great job with the conference publicity and for that we are very grateful. We also thank Elizabeth Woodruff for helping in many administrative and local arrangement issues.

Now we cannot forget to thank our sponsors: the Department of Bioengineering at the University of Colorado, Assistive Technology Partners at the Medical School, University of Colorado, the Coleman Institute for Cognitive Disabilities, the University of Florida, and the Institut Mines-Télécom, France. Their sponsorship and support were vital for the successful organization of this conference.

We wish you all a pleasant stay in Denver, and a memorable and rich experience in ICOST.

June 2014

Cathy Bodine
Sumi Helal

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Keynotes

A New IT (Inclusive Technology) Revolution

Frances W. West

IBM, One Rogers Street, Cambridge, MA 02142, USA

Abstract. With more than one billion people with disabilities worldwide, in addition to the aging population, novice technology users, people with language, learning and literacy challenges, or any individual facing a situational impairment while using a device, the global demand for accessibility has made it a mainstream requirement for governments and businesses around the globe. And, the success of trends such as mobile, social, smart TVs, wearable devices and cognitive technologies will depend on the ongoing integration of adaptive, intuitive and accessible technology capabilities. This means that CIOs and IT leaders need to provide technology solutions to reduce barriers for people with disabilities and realize that these same accessible technologies can increase productivity and improve the overall user experience for the mass market. Attendees will learn how next generation solutions are complementing and supplementing the human senses to better optimize communications and make information more meaningful and consumable to everyone.

Short Biography

Frances West is the worldwide director of the IBM Human Ability and Accessibility Center (HA&AC), a division of IBM Research. In this position, she advances IBM market leadership by driving technology innovation and solution development in the area of human ability and accessibility. Prior to her current assignment, Frances was director of Channels, Alliances and Business Development for IBM Lotus Software, where she recruited and managed IBM's global network of Business Partners specializing in Lotus software.

Frances joined IBM in 1979. Between 1979 and 1998, she held numerous management positions across the IBM sales and marketing organizations. In 1998, Frances became the Business Unit Executive of the Banking, Financial Services, Securities and Insurance Unit for the IBM Greater China Group. The following year, she was named the Director of Financial Services Sector Solutions for IBM Global Services, where she managed investment funding and executed financial services solution plans for ban king, insurance and financial markets. Since joining IBM Research to lead the HA&AC in 2003, Frances has become a globally-recognized expert in enabling human ability through accessible information and communications technology (ICT). She has served on the Board of Directors for numerous advocacy

organizations, including the American Association of People with Disabilities, the Assistive Technology Industry Association and the U.S. Business Leadership Network (USBLN). She currently sits on the Board of Directors of the World Institute on Disability, is the board advisor to the National Business & Disability Council, and Founding member and Program Co-Chair of G3ict, an advocacy initiative launched by the United Nations Global Alliance for ICT and development in 2006.

Frances has become a sought after authority on the topic of global ICT accessibility trends and enablement. In 2010, she delivered remarks at policy forums hosted by the United Nation's Global Initiative for Inclusive Information and Communications Technologies; a U.S. Department of Labor, Office of Disability Employment Policy roundtable; and an international forum hosted by the São Paulo State Secretariat for the Rights of Persons with Disabilities in Brazil. Most recently, in November 2013, she testified on behalf of the IT industry to the U.S. Senate Committee on Foreign Relations in support of the ratification of the Convention on the Rights of Persons with Disabilities. Frances attended the Chinese University of Hong Kong, Washington & Lee University in Virginia and graduated with a marketing degree from the University of Kentucky. In 2011, she received an Honorary Doctor of Science degree from the University of Massachusetts Boston. Frances is married with two sons and currently resides in West Newton Hill, Mass.

10 Years of Reminding Technologies: What Have We Learnt?

Chris Nugent

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Abstract. People with mild dementia generally exhibit impairments of memory, reasoning and thought. As a result, they require varying levels of support to complete everyday activities to maintain a level of independence. The use of technological solutions to address such impairments have been recognized as being capable of providing a positive impact on the quality of life for both the patient and their carer. Specifically, the integration of cognitive prosthetics, technology based solutions to augment reminding functionality, into everyday lives of people with dementia has been shown to be a popular approach. This presentation will reflect upon the journey of the development and evaluation of cognitive prosthetics over the last 10 years, highlighting lessons which have been learnt. This will involve considering, through the use of a range of Case Studies, the evolution of cognitive prosthetics from a device perspective, the impact of adopting a user centred iterative design process, through to more recent efforts of aligning solutions with everyday technological platforms. The presentation will conclude by considering future trends, most notably highlighting user profiling in an effort to improve technology adoption.

Short Biography

Chris received a Bachelor of Engineering in Electronic Systems and DPhil in Biomedical Engineering both from the University of Ulster. He currently holds the position of Professor of Biomedical Engineering at the University.

His research within biomedical engineering addresses the themes of the development and evaluation of Technologies to support ambient assisted living. Specifically, this has involved research in the topics of mobile based reminding solutions, activity recognition and prompting, formats for data storage and more recently technology adoption modeling. He has published extensively in these areas with the work spanning theoretical, clinical and biomedical engineering domains.

He has been a grant holder of Research Projects funded by National, European and International funding bodies. Amongst these projects he was the Scientific co-ordinator of the European Union MEDICATE consortium, Technical co-ordinator of the European Union CogKnow consortium and Technical co-ordinator of the ESRC New Dynamics of Aging Well Consortium.

At present he is Group Leader of the Smart Environments Research Group which was established in 2009 and is co-PI of the Connected Health Innovation Centre at the University of Ulster. He currently holds the position of Visiting Professor of Mobile and Pervasive Computing at Lulea Technical University, Sweden.

The Challenge of Assistive Technologies in Developing Countries

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Abstract. The challenge of providing assistive technology (AT) to people with disabilities is one that is becoming a mainstream concern as presented in the keynote by Frances West and supported by specific case studies presented in the keynote by Chris Nugent. In this talk we address the challenges of providing these supports in developing countries. Most of the world's 1 billion people with disabilities do not live in the developed world, simply because most of the world's population is not in developed countries. Yet our technological solutions often require an infrastructure that is missing in villages with little or no electricity, where family units are the only support for those with disabilities, with schools having little effective infrastructure, where mainstreaming has never been heard of and where there are no support agencies. In this talk we will begin with a review of the demographics and associated economics of the developed and developing world. Then we will compare a number of ATs and their appropriateness in a variety of developing world situations. Examples of AT that are effective will be presented. The lesson is that there is a spectrum of technical sophistication in AT and this spectrum needs to be supported in order to span developing and developed countries. Some suggestions for understanding the ecosystem of AT and how that maps to developing countries will be presented. We will close with an example of a sophisticated solution to a simple, but difficult, problem and how a social entrepreneurship start-up is helping to bring this to developing countries.

Short Biography

Michael Lightner is Professor and Chair of Electrical, Computer and Energy Engineering at the University of Colorado, Boulder. He received his PhD from Carnegie-Mellon. He is Co-Director of the NIDRR funded Rehabilitation Engineering Research Center for Adv ancing Cognitive Technologies at the University of Colorado Health Sciences Center and Technology Director of Boulder Digital Works, an innovate postgraduate digital media

program. He has also served as Associate Dean for Academic Affairs for the College of Engineering and Applied Science.

For many years his research was focused on electronic design automation including simulation, synthesis, test, formal verification and optimization. He has also worked in signal processing, most recently on multi-rate adaptive filters. The last ten years have been spent focusing on AT for people with cognitive disabilities. In this capacity he helped found and was Associate Executive Director of the University of Colorado Coleman Institute for Cognitive Disabilities, founded with a $250M gift from Bill and Claudia Coleman.

In these recent roles he has worked with a variety of government agencies and NGOs, and initiated the first IEEE Conference on the Future of Assistive Technology bringing together government, academia, industry, NGOs, public interest groups and the public to address the needs in AT over the next decade. He was made a Fellow of the IEEE for his contribution to computer-aided design. He is also a Fellow of the American Institute for Medical and Biological Engineering. Through his various roles in the IEEE, including 2006 President and CEO, and 2012–2013 Vice President for Education Activities, he has presented talks on Cognitive Assistive Technology in multiple locations in India, China, Africa, Indonesia, the EU and the USA. He has interacted with technology leaders in India on how cell phones can effectively be used in villages with little or no electricity.

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