Carnegie Mellon University
Research Showcase

Human-Computer Interaction Institute | School of Computer Science

1-1-2008

Ubiquitous Sustainablity: Citizen Science and Activism

Eric Paulos
Intel Research

Marcus Foth
Queensland University of Technology

Christine Satchell
University of Melbourne

Younghui Kim
Hongik University

Paul Dourish
University of California - Irvine

See next page for additional authors

Follow this and additional works at: http://repository.cmu.edu/hcii

Recommended Citation
Paulos, Eric; Foth, Marcus; Satchell, Christine; Kim, Younghui; Dourish, Paul; and Choi, Jaz Hee-Jeong, "Ubiquitous Sustainablity: Citizen Science and Activism" (2008). *Human-Computer Interaction Institute.* Paper 200.
http://repository.cmu.edu/hcii/200

This Conference Proceeding is brought to you for free and open access by the School of Computer Science at Research Showcase. It has been accepted for inclusion in Human-Computer Interaction Institute by an authorized administrator of Research Showcase. For more information, please contact research-showcase@andrew.cmu.edu.

Authors
Eric Paulos, Marcus Foth, Christine Satchell, Younghui Kim, Paul Dourish, and Jaz Hee-Jeong Choi

This conference proceeding is available at Research Showcase: http://repository.cmu.edu/hcii/200

Ubiquitous Sustainability: Citizen Science & Activism

Eric Paulos
Intel Research Berkeley
2150 Shattuck Ave #1300
Berkeley, CA 94704, USA
eric@paulos.net

Marcus Foth
Queensland University of Technology
Brisbane QLD 4059, Australia
m.foth@qut.edu.au

Christine Satchell
Interaction Design Group
The University of Melbourne
Melbourne VIC 3010, Australia
satc@unimelb.edu.au

Younghui Kim
Hongik University
72-1 Sangsu-Dong, Mapo-Gu,
Seoul 121-791, South Korea
younghui@missingpixel.net

Paul Dourish
Dept of Informatics
University of California, Irvine
Irvine, CA 92697-3440, USA
jpd@ics.uci.edu

Jaz Hee-jeong Choi
Queensland University of Technology
Brisbane QLD 4059, Australia
h.choi@qut.edu.au

ABSTRACT
In this workshop we propose to explore new approaches to bring about real environmental change by looking at the success of empowering technologies that enable grassroots activism and bottom up community participation. Ubiquitous computing is transforming from being mostly about professional communication and social interaction to a sensor rich personal measurement platform that can empower individuals and groups to gain an awareness of their surroundings, engage in grassroots activism to promote environmental change, and enable a new social paradigm – *citizen science*. This workshop brings together fresh ideas and approaches to help elevate individuals to have a powerful voice in society, to act as citizen scientists, and collectively learn and lobby for change worldwide.

Author Keywords
sustainability; environmental monitoring; citizen science; sensor networks; slogs; climate change; urban informatics.

ACM Classification Keywords
H5.0. Information interfaces and presentation (e.g., HCI): General. K.4.2 Social Issues.

PROPOSED URL OF SITE TO HOST PROGRAM
http://www.urbaninformatics.net/green3/

BACKGROUND
As UbiComp researchers and practitioners we struggle to understand, test, and envision scenarios of our technological futures, but as humans we have a collective higher calling – an ethical responsibility to acknowledge, address, and improve our own health, the health of our environment, and promote more sustainable lifestyles. There exists both synergy and tension between the progress of UbiComp and environmental concerns. There is little doubt that technology is able to play a vital role in positive environmental transformations. As UbiComp practitioners in this evolving field of environmental awareness and sustainability, we find more questions than answers. What are the big challenges? Are there standard approaches we can share? What will really matter?

Environmental conservation and anthropogenic climate change are issues that can no longer be ignored by any government, industry or academic community. Compared to the rapid rate that technology has been developed and integrated into everyday life, applications of ubiquitous technology to improve the ecological situation have lagged behind. This workshop builds on the success of two prior important environmentally themed workshops: *Ubiquitous Sustainability: Technologies for Green Values* at UbiComp 2007 and *Pervasive Persuasive Technology and Environmental Sustainability* at Pervasive 2008. Our workshop shares the goals of these two previous workshops by bringing together a diverse range of practitioners from computer science, engineering, sociology, architecture, urban planning, design, art, and other related fields. It differs in its scoping to explicitly evoke concepts of activism and citizen science as a vocabulary for building techniques, tenets, and technologies to bare on the issues of

TOPICS OF INTEREST
Paulos [1] proposes *citizen science* as a way to enable a participatory urbanism: "We need to expand our perceptions of our mobile phone as simply a communication tool and celebrate them in their new role as personal measurement instruments capable of sensing our natural environment and empowering collective action through everyday grassroots citizen science across blocks, neighborhoods, cities, and nations." While sensor rich ubiquitous computing devices usher in a compelling series of new device usage models that place individuals in the position of influence and control over their urban life, there

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.
UbiComp 2008, Sep 21-24, 2008, Seoul, South Korea.
Copyright 2008 ACM…$5.00

are a number of important barriers to the development and adoption of such systems. These research challenges form the topics of interest for this workshop and include:

From Socialite to Citizen: Redefining Identity – Ubiquitous devices such as mobile phones play a large part in helping the digital generation establish their sense of identity. We need only to look at marketing tactics to see how the mobile phone has become an iconic representative of 21st century lifestyle across geographical and cultural boundaries. How can the transformation of the mobile phone from a communications device to a 'personal instrument' that helps us measure and understand the world around us similarly encourage the user to embrace an active, environmentally conscious and responsible lifestyle?

Feedback Loops – What types of feedback loops provide information that allows users to see how their behavioral change is impacting on the environment?

Privacy and Anonymity – Users may desire to participate in public data collection but not at the expense of publicly disclosing their daily location traces and patterns. What mechanisms can ensure privacy and guarantee a level of anonymity for users and yet enable groups to make connections and foster open debates with their data?

Calibration and DIY Culture – Citizen science by definition explicitly enables the use of scientific data collection equipment by non-experts. The handling and usage of the sensors and measurement conditions will vary wildly – in and out of elevators, handbags, pockets, subway stations, etc. How can we reliably calibrate these sensors 'in the wild'? How can we create a common citizen science knowledge pool, lingo and nomenclature to identify, share and discuss measurement data?

Sensor Selection – What would be a reasonable set of sensors to use and what conditions make sense to measure? Where should the sensors be mounted and in what contexts and positions are they best sampled?

Environmental Impact – Finally, perhaps of greatest importance, while the vision is to provide millions of sensors to citizens to empower new collective action and inspire environmental awareness by sampling our world, the impact of the production, use, and discarding, of millions of ubiquitous sensors must be addressed. Does the overall benefit of citizen science enabled by these new devices offset their production, manufacturing, and environmental costs?

Other Issues: Authentication and trust, hardware extensibility, open platforms, software for sharing, and other technology that can support citizen science and grassroots activism such as wearables and carriables.

SOUTH KOREA AND ENVIRONMENTAL ACTIVISM

South Korea has a long history of environmental activism and provides an ideal setting to explore a set of culturally specific environmental challenges and the efforts to solve them. For example, the *Citizen Movement for Environmental Justice* (CMEJ) founded by Seo Wang-jin in 1999, has since become one of Korea's fastest growing NGOs focusing on environmental justice and the fair distribution of national resources. Korean environmental civic groups are also involved in grassroots political activities. For example, the *Civil Action for the 2000 General Election* (CAGE) consisting of 423 civil organizations incl. a number of green groups successfully launched a 'blacklist' campaign in 2000. The blacklist campaign was established to single out politicians they felt were "not qualified to run" due to positions on environmental and social issues. Of 86 blacklisted candidates, more than 60% failed to win their election.

WORKSHOP FORMAT AND ACTIVITIES

We want to actively engage and acknowledge the cultural history and landscape of Seoul in the workshop's interrogation, learning, and debate of UbiComp technology and strategies for environmental awareness, sustainability, and grassroots efforts. The workshop brings together passionate practitioners into a shared forum to debate important issues emerging in this rapidly evolving field. To that end the workshop format balances a small degree of individual presentations of work with a more involved series of collective brainstorming activities and design interventions. The workshop will serve as a 'safe place' to explore this design space away from the pressures of 'being right' and 'bad ideas' and leverage the location of Seoul as a palimpsest for active learning and exploration of this important topic. The overall outcome will be a series of new design sketches and approaches to guiding UbiComp research forward in harmony with the issues of the environment and sustainability.

THE ORGANISERS

Eric Paulos: Director, Urban Atmospheres, Intel Research Berkeley, USA. www.paulos.net

Marcus Foth: Australian Postdoctoral Fellow, Institute for Creative Industries and Innovation, Queensland University of Technology, Australia. www.urbaninformatics.net

Christine Satchell: Australian Postdoctoral Fellow (Industry), QUT & Interaction Design Group, The University of Melbourne, Australia.

Younghui Kim: Professor of Digital Media Design, School of the Art and Design, Hongik University, Korea. Co-Founder, Missing Pixel, New York. www.younghui.com

Paul Dourish: Professor of Informatics (and Computer Science and Anthropology), University of California, Irvine.

Jaz Hee-jeong Choi: PhD Candidate, Creative Industries Faculty, QUT, Brisbane, Australia. www.nicemustard.com

REFERENCES

1. Paulos, E., Honicky, R.J. and Hooker, B. Citizen Science: Enabling Participatory Urbanism. in Foth, M. ed. *Handbook of Research on Urban Informatics: The Practice and Promise of the Real-Time City*, IGI Global, Hershey, PA, 2008.