WORKSHOP - EXPAND YOUR DESIGN SPACE WITH ENERGY HARVESTING

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ABSTRACT

Today design research explores many new ways of interaction, which often requires energy-consuming technology. This limits the design space available and the purpose of this workshop is to open that space and make interaction possible in new scenarios with the possibilities of energy harvesting used as a tool to design in a new field of automated sustainable devices. Energy harvesting can make seamless and almost invisible interaction design possible.

INTRODUCTION

Ambient energy surrounds us – and the potential of powering wireless sensors, mobile devices and interactive sketches with 'energy harvesting' is growing. However, the question of how to grasp the solar, thermal and kinetic energy and supply it to electronics is a challenging task.
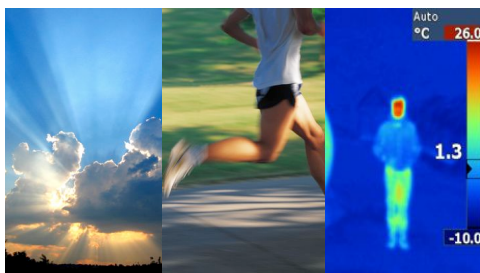

Figure 1: Ambient energy in form of solar, kinetic and thermal

This workshop offers participants the opportunity to expand their design back catalogue, introducing the concept and practical hands-on knowledge of working with energy harvesting devices. For design researchers, this means exemplifying the concept of experience prototyping in their own design process; and working with these new tools - solar, kinetic, and thermal energy harvesters.
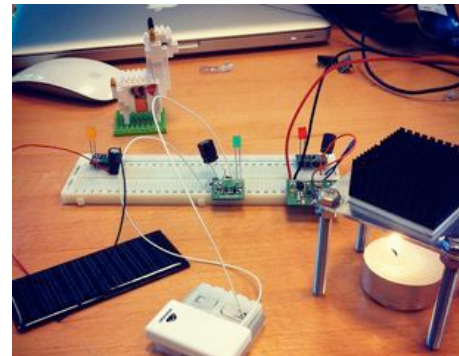

Figure 2: Energy harvesting kits – with solar cell, kinetic push button and thermoelectric generator

Workshop participants will gain a new design space, one that is fundamentally important to future design problems. Battery- and cable-less designs will enable new areas of interaction not previously available due to restrictions in battery change or cable draw. Furthermore, it changes the user interaction with products, which with energy harvesting can be fully sealed while the user newer having to worry about changing batteries / attach power cable.

Interactive embedded technology in the (near) future will require batteryless solutions - able to operate in even the harshest of conditions, and be able to deployed en masse. For a truly 'everyware' (Greenfield, A. 2006) world, in which devices surround and interact with us; new solutions in energy provision must be applied.

The authors are experts in the field of Energy Harvesting and Interaction Design and bring a unique insight into this workshop. Having conducted several energy harvesting workshops at universities, the authors would like to engage the workshop participants, and challenge them to reflect on their design process; reframing their design problems with a new domain, that of energy harvesting. Limiting factors like required user interaction at battery change and power cables, and location restrictions are lowered significantly when utilizing energy harvesting.

We offer them the tools to learn this domain hands-on. We will work with three energy harvesting kits, which teach the basic concept of solar, kinetic, and thermal energy harvesting.

As explained in (Buchenau and Suri, 2000) "The role of Experience Prototyping here is to let a client, a design colleague or a user understand the subjective value of a design idea by directly experiencing it." We propose that participants can take on the role of energy harvesters, exploring their design problems through the eyes of the future sustainable designer, and furthermore, give themselves a design constraint - to provoke, challenge, and hopefully grow their ideas into something which encompasses the principles of energy harvesting while remaining true to the design research process. The participants will be taken through the process of rethinking the required user interaction and the energy consumption, briefly evaluating the ambient environment exploring the available energy leading to viable solutions of self powered designs.

The outcome of this workshop will be tri-fold: firstly, to introduce participants to energy harvesting technologies, secondly, to give them a new design space, provide a design constraint, and allow them to reflect on this interaction, and finally, to create a symbiosis between Design Research and Energy Harvesting.

TENTATIVE PROGRAM
1 hour:
Introduction to energy harvesting technologies, and an outline of the workshop, including goals and expected outcomes.

45 min:
Hands-on introduction to energy harvesting and building of one of three energy harvesting kits (thermal, kinetic, solar) in small groups.
(Kits will be available for purchase after the WS)

Brainstorm about new energy harvesting design spaces (mind map on poster paper)

Group discussion about the new design space - introduction of main thoughts and points.

15 min:
Break

30 min:
Each small group picks a topic from the new design space and then creates a functioning model of their concept using the energy harvesting kits.

30 min:
Prepare, and present, in groups, the outcome of the workshop.

/END

VENUE REQUIREMENTS
We are familiar with the venue and requests the use of:

- a room large enough for 10 - 15 people;

- long tables and benches or chairs to work on; and,

- a projector and wall or screen to project on,

- whiteboard or poster paper for drawing illustrations,

- electricity: Extension cords and power bars

We will provide energy harvesting Kits, posters, paper, writing utensils and paper prototyping materials.

ATTENDEE SELECTION
Attendees will be selected on the basis of a short, half page written document, indicating what they hope to gain from the workshop, and their experience and interest with new technologies in the design research process.

A total of 15 attendees can join the workshop, though the ideal number would be 12.

REFERENCING
Greenfield, Adam (2006). Everyware: the dawning age of ubiquitous computing. New Riders. pp. p.11–12. ISBN 0-321-38401-6.

Buchenau, M., Suri, J., F. 2000, 'Experience prototyping'. *Symposium on Designing Interactive Systems. Proceedings of the ACM conference on Designing interactive systems: processed, practices, methods, and techniques*. Brooklyn, NY United States.

COLUMNS ON THE FINAL PAGE SHOULD BE OF EQUAL LENGTH