

---

# NatureCHI - Unobtrusive User Experiences with Technology in Nature

**Jonna Häkkinä**

University of Lapland  
Yliopistokatu 8  
96400 Rovaniemi, Finland  
jonna.hakkila@ulapland.fi

**Keith Cheverst**

Lancaster University  
LA1 4WA UK  
Lancaster, UK  
k.cheverst@lancaster.ac.uk

**Johannes Schöning**

Hasselt University – tUL - iMinds  
Wetenschapspark 2  
3590 Diepenbeek, Belgium  
johannes.schoening@uhasselt.be

**Nicola J. Bidwell \* \*\***

\*University of Namibia  
Windhoek, Khomas, Namibia  
\*\*University of Pretoria  
Pretoria, Gauteng, South Africa  
nic.bidwell@gmail.com

**Simon Robinson**

Future Interaction Technology Lab  
Swansea University, SA2 8PP, UK  
cssimonr@swansea.ac.uk

**Ashley Colley**

University of Lapland  
Yliopistokatu 8  
96400 Rovaniemi, Finland  
ashley.colley@ulapland.fi

Permission to make digital or hard copies of part or all 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. Copyrights for third-party components of this work must be honored. For all other uses, contact the Owner/Author.  
Copyright is held by the owner/author(s).  
CHI'16 Extended Abstracts, May 07-12, 2016, San Jose, CA, USA  
ACM 978-1-4503-4082-3/16/05.  
<http://dx.doi.org/10.1145/2851581.2856495>

**Abstract**

Being in nature is typically regarded to be calming, relaxing and purifying. When in nature, people often seek physical activity like hiking, or meditative, mindful or inspiring experiences remote from the urban everyday life. However, the modern lifestyle easily extends technology use to all sectors of our everyday life, and e.g. the rise of sports tracking technologies, mobile phone integrated cameras and omnipresent social media access have contributed to technologies also arriving into the use context of nature. Also maps and tourist guides are increasingly smart phone or tablet based services. This workshop addresses the challenges that are related to interacting with technology in nature. The viewpoints cover, but are not limited to interaction design and prototyping, social and cultural issues, user experiences that aim for unobtrusive interactions with the technology with nature as the use context.

**Author Keywords**

Nature; unobtrusive interaction design; value based design; mindfulness.

**ACM Classification Keywords**

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.



**Figure 1.** Using a mobile tour guide at a hiking track (top), projecting to a plant [2], and using an interactive icewall in a nightclub (bottom) [13].

## Background

### *Technology Meeting Nature*

What we call “nature” is inherently and integrally an important aspect of life. It can be referred to as the home and origin of humankind, a refreshing place to seek experiences and adventures, and to perform physical exercise. In the hectic pace of urban lifestyle, people often seek serendipity and calmness, and pure and refreshing experiences from nature. Furthermore, as presented in [3] “Real and virtual engagement with nature elicits positive and restricts negative affects (e.g. anger, aggression); re-balances physiological arousal and renews attentional resources...”. We seek engagement and connection with nature through various activities – e.g. hiking, gardening, or visiting places as a tourist. Values linked to themes such as sustainability, recycling and ecologic lifestyle are based on a respect for nature.

On the other hand, technology has become an integral part of our everyday life in the so-called ‘developed world’. Certainly, a significant ‘first world problem’ is the fact that we can be connected to our social networks 24/7 through smartphones and tablets, even up to the point of problematic and addictive behavior [11], and document and blog daily events. Technology use has also arisen when we are in nature – using navigation apps and digital maps, or taking selfies with smart phones at beautiful nature views, for example. Technological aids are also used e.g. when hunting with dogs [10] or tracking sports [1], and more concepts have been suggested e.g. for mountaineering [8] and backcountry skiing [7]. Technology can be used to bring people to defined places to enjoy the same experiences [6] or to facilitate solitude by providing guidance on how to avoid other people [9]. It can offer

a way to bridge different ways of knowing, such as those of indigenous or rural inhabitants in e.g. [4, 5]. In addition, the way we design things or utilize the possibilities of interactive installations can raise our awareness of the fragility of nature as well as something ‘red in tooth and claw’ - highlighting the vulnerability of human kind if an ecological catastrophe takes place, as pointed out in [5]. Elements of nature can also intensify the emotional aspects of interaction, as explored with plants in [12].

Bringing technology into nature may potentially distract the nature experience, but can also provide possibilities to share the moment, store mementos, and access services “in-the-wild”. This workshop addresses the overlapping area of technology usage and experiences with nature, looking at the challenges, potential conflicts, and novel possibilities between these. Examples of research areas interesting to the workshop are illustrated in Figure 1.

### *Workshop Topics of Interests*

The topics of interest for the workshop include, but are not limited to the following:

- Design and use of unobtrusive technologies and services for interacting in nature
- Novel UI mechanisms and metaphors for interacting with nature
- Nature integrated UIs and technologies
- Cultural aspects of interactions in nature
- Social acceptance of technology use in nature
- Non-use of technology vs. the use of enabling technologies in nature
- Technologies that enable going into nature but do not interrupt the user’s experience of nature

- Reliance on technology in nature, and its potential consequences
- Value based design and respect of nature
- Temporal design aspects and ephemeral user interfaces with nature as the use context
- Designing for individual users vs. travelling together, and converging and diverging user group behavior in nature
- Recommendations for being in nature in the relevant context, e.g. weather, floods, ground saturation

This workshop will bring together researchers and practitioners from academia, industry (e.g. experience industry, tourism, natural resources) and art-based design to discuss and share their research and insight. We welcome participants working with user research, ethnography, design, prototyping, evaluation, natural materials, and want to facilitate a multidisciplinary approach through the workshop.

#### *Goals of the Workshop*

The most important goal of the workshop is: 1) to gather together the researchers who are conducting research in the cross section of technology and nature, and build the network among these people. The other goals of the workshop are: 2) to identify the key trends of current research and future research guidelines in the area, and, 3) promote the research of technology usage in nature and make larger audiences aware of current research as well as the promise and risks related to the topic. Yet another goal is: 4) to foster the research community and create a plan for sequential workshops or other events.

#### **Organizers**

**Jonna Häkkinen** is a professor at Faculty of Art and Design, University of Lapland. She has led User Experience (UX) and concepting teams in Nokia Research Center (2007-2011) and Center for Internet Excellence, University of Oulu, Finland (2011-2014). Her research interests include mobile and ubiquitous interaction and user experience design. Currently she is working e.g. on using natural materials for tangible interactions.

**Nicola J. Bidwell** is Prof. and Prof. Extraordinaire at the Universities of Namibia and Pretoria in southern Africa and affiliated researcher at Royal Melbourne Institute of Technology, Australia. Since 2003 Nicola has focused on designing interactions with ICTs for rural settings and Indigenous and African cultures. Nicola takes a critical design perspective and applies situated, ethnographic and participatory methods. She has 100 publications including a book: *At the Intersection of Traditional & Indigenous Knowledges and Technology Design*

**Keith Cheverst** is a Reader with the School of Computing and Communications, Lancaster University. A significant focus of his research over the last 20 years has centered on the design and deployment of mobile systems that provide support for locative media experiences and wayfinding in both rural and urban settings.

**Johannes Schöning** is Professor of computer science at Hasselt University working at the Expertise centre for Digital Media (EDM). His main research interests lie at the intersection between human-computer interaction

(HCI), geographic information science and ubiquitous interface technologies.

**Simon Robinson** is a Research Officer at Swansea University. His work focuses on the human side of mobile interaction, arguing for heads-up and real world-based approaches.

**Ashley Colley** is User Experience researcher and PhD student in the UX team at the University of Oulu, Center for Internet Excellence. He has more than 25 years industry experience, mostly in creative technologist roles, and is the inventor of more than 25 patents

### **Website**

The workshop web pages can be found at [www.naturechi.net](http://www.naturechi.net). The web pages contain the details of the workshop call, link to the submission system, and upon acceptance, workshop papers.

### **Pre-Workshop Plan**

#### *Key dates*

The important dates associated with the workshop's organization are as follows:

- Call out: 15 November
- First submission deadline: 16 December 2015
- Notification of acceptance: 21 December 2015
- Second submission deadline: 13 January 2016
- Second notification of acceptance: 12 February 2016
- Workshop day: Saturday 7 May or Sunday 8 May 2016

#### *Before the Workshop*

The call for the workshop will be distributed in HCI related emailing lists. A flyer will be designed and distributed at HCI venues, and we will advertise the workshop at upcoming HCI conferences and among key research groups. The distribution of the call also happens through the members of Program Committee. We will also recruit people through social media and our personal networks. Web pages for the workshop have been set up by the organizers.

### **Workshop Structure**

#### *Workshop Format*

The workshop is organized as a one full day workshop. It will consist of workshop paper presentations, demos, out of the classroom group exercise and discussions, and will be held in a lecture room for ca. 25 people. The estimated number of workshop participants is 15-20. Each participant will contribute to the workshop with a position or research paper (4 pages in CHI EA format), which introduces aspects of the participant's prior research, future plans, insights or interests in the area. The submissions will be reviewed by the workshop program committee and organizers. The selection of participants is based on the EA reviews for the quality, novelty and inspirational aspects, aiming for a good balance of different perspectives on the workshop topic.

#### *Activities and Timing*

The preliminary workshop schedule is as follows:

- Opening of the workshop
- Morning session(s): paper presentations (ca. 5 minutes per paper), followed with a discussion
- Start of hands-on group work outside the classroom
- Lunch

- Presenting the group work
- Exercise with design probes
- Coffee
- Demo session
- Results of the design probes session
- General discussion of future directions
- Closing of the workshop
- Evening: workshop dinner

Group work will consist of an interactive exercise done in groups of 4-5 people. In this out-of-the-classroom exercise, the groups have 45 minutes to explore the environment (preferably outdoors) and find a place where they design a concept around a nature experience. The place is documented with photos and/or videos, and where appropriate found artefacts, the concept should integrate a non-disruptive technology element to the experience with a nature. A presentation about the concept is created as a ppt presentation or video (preparation time appr. 30 minutes). After lunch, the concepts are presented and discussed. The organizers will provide physical low-fi prototyping equipment, such as frames, transparencies,

post-it notes and creative stimuli that can be utilized in the concept creation.

The material probes exercise will consist of design probes: large posters of natural views, and natural materials. Participants go through these probes in groups, and create a map of key elements in the experience, and how the context or material presented by the probe could be integrated with the technology to create an unobtrusive, enhanced experience.

### **Post-Workshop Plan**

After the CHI workshop, we will conduct a hands-on design workshop on Nature and HCI at Arctic Design Week in February 2017, hosted by University of Lapland, Finland. We will apply to have a summary article for Interactions Magazine. We also plan to organize a journal special issue where the participants will be encouraged to publish their work. The workshop papers will be available via the workshop webpage prior and after the workshop, providing opportunity for participants to familiarize themselves with all papers prior to their presentation.

### Call for Participation

The 'NatureCHI - Unobtrusive User Experiences with Technology in Nature' workshop addresses the overlap of technology usage and experiences with the nature. The ever-growing omnipresence of technology in our everyday life and the idea of nature with pure, meditative or adventurous experiences may create conflicts in values, cultures and user behaviour. On the other hand, technology may be used to share or intensify experiences, or for bringing a piece of nature closer (as well as more accessible).

This workshop focuses on the challenge of designing unobtrusive technology usage and user experiences in nature. We welcome researchers and practitioners working on ethnographic studies, user research, design cases, prototype development and artistic installations related to technology and nature. The one day workshop will include short presentations, exercises outside of the classroom and with design probes, and a demo session.

To apply to the workshop, submit a max. 4 page position or research paper in CHI EA format (references will not count towards page limit), through the Easy Chair submission system (see workshop webpage). The submission deadlines are December 16th 2015 and January 13th 2016. The papers will be reviewed by the workshop organizers and program committee. Accepted papers will be made available at the workshop webpage. Upon acceptance, at least one author of each accepted paper must attend the workshop. All participants must register for both the workshop and for at least one day of the conference.

More details can be found from the workshop webpage: <http://www.naturechi.net>

### References

1. Aino Ahtinen, Minna Isomursu, Ykä Huhtala, Jussi Kaasinen, Jukka Salminen, and Jonna Häkkilä. 2008. Tracking Outdoor Sports --- User Experience Perspective. In *Proceedings of the European*

*Conference on Ambient Intelligence (AmI '08)*, Emile Aarts, James L. Crowley, Boris Ruyter, Heinz Gerhäuser, Alexander Pflaum, Janina Schmidt, and Reiner Wichert (Eds.). Springer-Verlag, Berlin, Heidelberg, 192-209.

DOI=[http://dx.doi.org/10.1007/978-3-540-89617-3\\_13](http://dx.doi.org/10.1007/978-3-540-89617-3_13)

2. Liam Betsworth, Huw Bowen, Simon Robinson, and Matt Jones. 2014. Performative technologies for heritage site regeneration. *Personal and Ubiquitous Computing* 18, 7 (October 2014), 1631-1650. DOI=<http://dx.doi.org/10.1007/s00779-014-0766-3>
3. Nicola J. Bidwell and David Browning. 2010. Pursuing genius loci: interaction design and natural places. *Personal Ubiquitous Comput.* 14, 1 (January 2010), 15-30. <http://dx.doi.org/10.1007/s00779-009-0217-8>
4. Nicola J. Bidwell, Masbulele Siya, Gary Marsden, William D. Tucker, M. Tshemese, N. Gaven, S. Ntlangano, Simon Robinson, and Kristen ALI Eglinton. 2008. Walking and the social life of solar charging in rural africa. *ACM Trans. Comput.-Hum. Interact.* 20, 4, Article 22 (September 2008), 33 pages. <http://doi.acm.org/10.1145/2493524>
5. Nicola J. Bidwell, Heike Winschiers-Theophilus, Gereon Koch-Kapuire, and Shilumbe Chivuno-Kuria. 2011. Situated interactions between audiovisual media and African herbal lore. *Personal Ubiquitous Comput.* 15, 6 (August 2011), 609-627. DOI=<http://dx.doi.org/10.1007/s00779-010-0337-1>
6. Keith Cheverst, Trien V. Do, Dan Fitton. Supporting the Mobile In-situ Authoring of Locative Media in Rural Places: Design and Expert Evaluation of the SMAT app. *IJHCR* 6(1): 1-19 (2015)
7. Anton Fedosov and Marc Langheinrich. 2015. From Start to Finish: Understanding Group Sharing Behavior in a Backcountry Skiing Community. In

- Proceedings of the 17th International Conference on Human-Computer Interaction with Mobile Devices and Services Adjunct (MobileHCI '15)*. ACM, New York, NY, USA, 758-765.  
DOI=<http://dx.doi.org/10.1145/2786567.2793698>
8. Felix Kosmalla, Florian Daiber, and Antonio Krüger. 2015. ClimbSense: Automatic Climbing Route Recognition using Wrist-worn Inertia Measurement Units. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*. ACM, New York, NY, USA, 2033-2042.  
<http://doi.acm.org/10.1145/2702123.2702311>
  9. Maaret Posti, Johannes Schöning, and Jonna Häkkinen. 2014. Unexpected journeys with the HOBbit: the design and evaluation of an asocial hiking app. In *Proceedings of the 2014 conference on Designing interactive systems (DIS '14)*. ACM, New York, NY, USA, 637-646.  
DOI=<http://dx.doi.org/10.1145/2598510.2598592>
  10. Mikko Paldanius, Tuula Kärkkäinen, Kaisa Väänänen-Vainio-Mattila, Oskar Juhlin, and Jonna Häkkinen. 2011. Communication technology for human-dog interaction: exploration of dog owners' experiences and expectations. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '11)*. ACM, New York, NY, USA, 2641-2650.  
DOI=<http://dx.doi.org/10.1145/1978942.1979329>
  11. Choonsung Shin and Anind K. Dey. 2013. Automatically detecting problematic use of smartphones. In *Proceedings of the 2013 ACM international joint conference on Pervasive and ubiquitous computing (UbiComp '13)*. ACM, New York, NY, USA, 335-344.  
<http://doi.acm.org/10.1145/2493432.2493443>
  12. Cameron Steer, Simon Robinson, and Matt Jones. 2015. Growth, Change and Decay: Plants and Interaction Possibilities. In *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '15)*. ACM, New York, NY, USA, 2037-2042.  
<http://doi.acm.org/10.1145/2702613.2732765>.
  13. Leena Ventä-Olkkonen, Panu Åkerman, Arto Puikkonen, Ashley Colley, and Jonna Häkkinen. 2014. Touching the ice: in-the-wild study of an interactive icewall. In *Proceedings of the 26th Australian Computer-Human Interaction Conference on Designing Futures: the Future of Design (OzCHI '14)*. ACM, New York, NY, USA, 129-132.  
DOI=<http://dx.doi.org/10.1145/2686612.268663>