

Inviting Participation through IoT: Experiments and Performances in Public Spaces

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ABSTRACT

This paper proposes a workshop on the Internet of Things (IoT) for participation in public life. We will bring together artists, designers, practitioners, and academics interested in site-specific projects involving lighting and other ambient technologies intended to serve community interests such as representation and safety. The authors share their current inquiry on stairwells as an example. Discussion of this project and others will help us locate, trace, and develop networked environments.

Author Keywords

IoT, public design, participation, cities.

ACM Classification Keywords

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

INTRODUCTION

This paper proposes a workshop on the Internet of Things (IoT) for participation in public life. The Internet of Things is widely understood as a system of networked objects (e.g. toasters or thermostats) that sense and communicate aspects of their environment. They can then share this information with users or manufacturers. Many common examples of IoT exist within the home for tracking and conserving energy. The Nest thermostat, for example, adapts itself to its owner's schedule, turning on when someone is present [3]. This off-loads the burden of adjusting the temperature to the device. It also corrects for some human error (i.e. forgetting to turn the thermostat off when exiting the home). Current examples of Public IoT include mobile air quality sensors, networked traffic lights that respond to movement and trashcans that signal when they need to be emptied [4]. The focus in public IoT, as with home IoT, has been largely on efficiency.

Our intent is to expand the discussion of IoT from efficiency and automation to participation. In this

workshop, we propose to gather artists, designers, practitioners, and academics who share an interest in IoT for participation in public life. We use the term participation to include concerns for expressivity, safety, and presence. We specifically ground our proposal in a discussion of networked installations and performances in the urban environment (e.g., lighting and other ambient cues) to imagine the future of public IoT.

To explore the potentials of IoT for participation, we must consider the limitations of what currently exists. Simple motion-activated streetlamps have been put in a number of cities such as Barcelona and Oslo [1,2]. Such implementations are straightforward in a sense and may help people traversing the space. For some, changing poor lighting conditions in public staircases, underground walkways or other passages could enable nighttime and early morning movement — augmenting visibility and ultimately safety. But who and what else will be affected by this increase in visibility? Certainly other people (or animals or things) might make use of the space for inhabitation at different lengths of time. How might their ability to move through this space be affected with this illumination? Would the added light create visibility where some would prefer it to remain out of sight? One can imagine that skateboarders, for instance, might not want to be constantly exposed by light for fear of being removed from the area. There are also maintenance and city workers whose job it might be to keep eye on the area. What would it do to their own feelings of autonomy knowing that they were always being sensed? Would the expectations of thoroughness of their work be increased with the addition of 'smart' lighting? The tensions between seeing and being seen should be considered in any public IoT intervention.

Recent experiments in design and art highlight the myriad influences on our sensory experiences in public life. In Future City Lab's Lightweave proposal for the NOMA Underpass Design Competition, ambient sounds from above cars and trains overhead are transformed into wave patterns of light that brighten the path [5]. In this environment, both the sound and light that fill the underpass are now dictated by the automobiles that have moved pedestrians underground. The power in this situation is not with the people afoot, but with the machines above. In our research, we are examining stairwells in Seattle,

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Washington to investigate how light can reveal and cultivate belonging and participation. The premise of this work is that IoT implementations can constructively transform public spaces, supporting their practical and social value.

WORKSHOP ORGANIZATION

The one-day workshop will involve three discussion periods broken up by brief walking exercises. Before the workshop, participants will document a memorable walk through public space and bring that documentation to the workshop: a trace of a particular route (e.g. using paper maps or online mapping software such as open street maps). During the workshop, participants receive simple probes such as flashlights and mini-drums for their walking exercises. The discussion topics will include: 1) Participation through Public IoT 2) Critical Alternatives to Public IoT, and 3) Designing for Public Engagement. The proposed topics and exercises are subject to change based on the position papers submitted by participants.

Discussion 1: Participation through Public IoT

What counts as public IoT design? What are emerging examples of participation through public IoT? How is participation shaped by IoT design and the forms of infrastructure that underlie it?

Walking Exercise 1: Follow a GIS Route from another site

Participants will break into groups of two. Each person will show their partner the memorable walk they brought to the workshop. Together, they will then choose one walk through Aarhus. Along the way, they will reflect on their journey in relation to the previously travelled path. Upon return, all workshop participants will discuss the forms of public participation this juxtaposition enables. This exploration is meant to lead into the following discussion of Critical Alternatives.

Discussion 2: Critical Alternatives to Public IoT

What constitutes a critical alternative to public IoT? In what ways are IoT objects imagined as participatory? How might the introduction of IoT help us negotiate varying interests, priorities and concerns? How might IoT enable pedestrians to occupy a space, to demand its safety? How could this occupancy be signaled to those far away (drivers on an overpass)? How could IoT reflect occupancy (e.g., light up when a critical mass of people are in a space rendering it safe) or try to create safety (e.g., through lighting in advance of occupancy)?

Walking Exercise 2: Follow a GIS Route from another site

In small groups, participants will take a walk to the endpoint of their prior journey and document the sociotechnical infrastructures they encounter along the way (e.g., sketching, photography, mapping). They will share their observations with another group upon return and

discuss the kinds of public participation this infrastructure makes possible.

Discussion 3: Designing for Public Engagement

What kind of design interventions might invite occupancy of a space? What kind of infrastructural elements (e.g., lighting) might aid engagement without increasing the vulnerability of pedestrians? How might it provide refuge and vista?

TOPICS OF INTEREST

We invite contributions on topics including but not limited to:

- Public participation
- IoT and public life
- Public performances and interventions to invite participation
- Politics of public IoT
- Histories of interventions for participation

OUTCOMES

We intend to incorporate discussions from this workshop in an NSF workshop proposal on the topic of IoT and public space. Workshop discussions and materials will be documented and posted to the workshop blog. The website will be maintained after the workshop, allowing for participants to continue conversations and collaborations supporting future discussion of public IoT.

ORGANIZERS

Sarah Fox is a PhD student working in the Tactile and Tactical (TAT) Design Lab at the University of Washington, where she conducts a broad range of design research, ethnographic study, and speculative design. She holds a Master's degree in Digital Media from the Georgia Institute of Technology, where she was a part of the Intel Science and Technology Center for Social Computing. She has interned with Microsoft Research in Cambridge, UK and the Interaction and Experience Research group at Intel Labs in Santa Clara, CA, USA.

Daniela K. Rosner is an Assistant Professor of Human-Centered Design & Engineering (HCDE) at the University of Washington where she co-directs the Tactile and Tactical Design Lab (TAT lab) and seeks to understand emerging sites of digital production, from hobbyist fixer groups to feminist hacker collectives. She holds a Ph.D. from UC Berkeley's School of Information, a M.S. in Computer Science from the University of Chicago, and a B.F.A. in Graphic Design from the Rhode Island School of Design. Daniela has been a regular columnist for Interactions Magazine, a bimonthly publication of ACM SIGCHI, and now serves as an editor for a forum called Design as Inquiry.

Margaret Morris is a clinical psychologist and senior research scientist at Intel focusing on technology and emotional communication. Prior to joining Intel, she was an experience Modeler at Sapien. Margaret received her BA from Haverford College, her PhD from the University of New Mexico, and completed her postdoctoral fellowship from Stanford University. For talks and publications: margiemem.com.

Kathi R. Kitner is a cultural anthropologist and Senior Research Scientist with Intel Labs' since 2006, is currently studying how increasing instrumentation/digitization (the Internet of Things) might help to enhance cultural resilience in the face of climate change in both wild and urban environments. Previous to working at Intel Corporation, she focused social impact assessments in United States and Caribbean fishing communities. Kitner holds a Ph.D. in Anthropology and Latin American Studies from the University of Florida.

CALL FOR PROJECTS AND PERFORMANCES

We invite work submitted in the following forms:

1. A brief description of a project or performance (500 to 1000 words). This can be a work in progress or a project authors have completed. Those submitting will be encouraged to provide external links or videos that further illustrate the work.
2. A critique of a project orchestrated by other individuals, a governing body, or corporation (500 to 1000 words).
3. A speculative proposal for public IoT that incorporates concerns for power, participation, and agency. Site specificity is encouraged. Authors are free to submit image or video based proposals. A brief supplementary text description of the proposal is encouraged (250 to 500 words).

We will recruit participants via social media and email lists around the fields of science and technology studies, design, and information systems. Participants will be selected based on the potential of their projects to investigate concerns for belongingness and participation or the thoughtfulness of their critiques.

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