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# Pervasive Play

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**Abstract**

The infusion of mobile and collaborative technologies into our everyday lives enables new forms of pervasive games and play. We use the term *pervasive play* as shorthand for technology-mediated, playful experiences that are tethered to our everyday lives through the physical and virtual spaces we inhabit. This includes a variety of game and play genres ranging from alternate reality games to urban games to mixed reality performance and playful uses of public displays. The goals of the workshop are to (a) strengthen and broaden the community of pervasive play researchers and practitioners, (b) explore design frameworks for creating novel pervasive play experiences, and (c) identify key research questions, methods, and challenges for future research in this area.

**Author Keywords**

Games; pervasive; mixed reality; augmented reality; alternate reality; social games; social play; transmedia.

**ACM Classification Keywords**

H.5.m [Information Interfaces and Presentation (e.g., HCI)]: Miscellaneous; K.8.0 [Personal Computing]: Games; J.4 [Social and Behavioral Sciences].

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## Background

### *What is Pervasive Play?*

HCI researchers have examined technology-mediated games and play since the early days of HCI [14]. Increasing interest has led to the recent creation of the CHI Play conference and student game design competition, amongst other ventures. Research has examined the design [10] and evaluation [9] of games, playful experiences incorporating a range of technologies and artifacts [11], and the efficacy of games in various domains like health and learning [19]

In this workshop, we focus on *pervasive play*. Pervasive play involves technology-mediated, playful experiences that are interwoven throughout our everyday lives and the physical and virtual spaces we inhabit. Pervasive play blends the physical and virtual worlds and blurs the line between fiction and reality. It transforms our existing places, relationships, and technologies into platforms for gameplay. In the words of Montola, Stenros, and Waern, pervasive games (which we broaden to play) include “one or more salient features that expand the contractual magic circle of play spatially, temporally, or socially” [18].

Pervasive play includes, but is not limited to, genres such as location-based games, augmented and alternate reality games, ubiquitous and urban games, playful public displays, transmedia storytelling, social networking games, and serious games that promote exercise, familial relationships, or cultural exploration. With the continued proliferation of mobile devices, public displays, and other forms of ubiquitous technologies, it is likely that games and play will increasingly allow people to interact with others and their surroundings in new and interesting ways.

### *Related and Inspirational Research*

Pervasive play has been examined from many perspectives. Early foundational work defined pervasive play as a domain of inquiry [2,18] and demonstrated experimental games and interactive performances (e.g., Blast Theory and the Mixed Reality Lab’s “Uncle Roy All Around You,” “Desert Rain,” and “Can You See Me Now?” [3,6]). Empirical case studies by CHI designers and researchers [21] and experts in performance art and game design [16] have examined how live action role-playing (LARP) and alternate reality games (ARGs) immerse players in believable, mixed reality game worlds through various combinations of physical play and transmedia experiences.

Studies have investigated the ways in which designers orchestrate players through various trajectories of interaction and engagement (e.g., temporal trajectories, canonical vs. participant trajectories) [3], and proposed design patterns for sustaining the replayability of pervasive play experiences [12]. They have also explored new techniques for developing [7] and prototyping [5] pervasive games. Beyond CHI, humanities and social science researchers are exploring how pervasive play activities and distributed narratives motivate players to develop their own sense-making and knowledge production practices [8].

Moving forward, we see the potential for radically new forms of play enabled by the ubiquity of mobile devices, sensors, and social media coupled with new interfaces, displays, and transmedia practices.

## Pervasive Play “Super-Hero” Trading Card

(Sample)


| Superhero Profile   |                       |
|---|-----------------------|
|                              | Real Name             |
|   | Hero Name             |
|   | Affiliation           |
| Strengths:  |                       |
| Weaknesses:   |                       |
| Educator <input type="checkbox"/> Gamer <input type="checkbox"/> Designer <input checked="" type="checkbox"/> |                       |
| Humor   | <input type="range"/> |
| Intellect   | <input type="range"/> |
| Energy  | <input type="range"/> |
| Teamwork  | <input type="range"/> |
| Creativity  | <input type="range"/> |
| History:  |                       |

Figure 1: This superhero trading card template is a sample of one part of the “pervasive play participant profile” that we will ask interested individuals to submit in order to be invited to our workshop.

In addition to filling out Pervasive Play SuperHero trading card templates, potential participants will submit one-page abstracts outlining current or planned projects related to our workshop themes.

### *The Importance to CHI*

This workshop will build on the solid foundation of prior research, while exploring new possibilities for pervasive play that have emerged in recent years. Our workshop has three primary goals: community building, the exploration of promising research and design frameworks for pervasive play, and the articulation of future research directions including research questions, methods, and challenges. Meeting these three objectives will assure that the CHI community stays at the center of pervasive play research and design.

Despite the strong HCI focus on games, and even pervasive play, relevant work is published in disparate venues and a strong sense of community amongst researchers and practitioners is lacking. We believe the interdisciplinary nature of CHI makes it an ideal hub for bringing together such a community and setting an agenda in this critical growth area. Periodic workshops on pervasive and mixed-reality games in related venues (e.g., CHI Play, CSCW) have demonstrated continued interest in this topic, while also pointing out the need to reach a broader group of CHI researchers and practitioners. With a focus on pervasiveness as a feature, there is ripe opportunity to develop deeper collaborations between designers of playful experiences and domain experts across the social sciences and humanities.

### *Themes*

We have organized our workshop themes under the following three categories (inspired by [18]):

#### THEORY DEVELOPMENT

- Frameworks describing core characteristics, mechanics, and genres of pervasive play

- Research methods for studying pervasive play
- Theoretical constructs related to pervasive play and related concepts
- Historical roots of pervasive play
- Comparative analyses of pervasive games & play
- Narratological perspectives on transmedia design

#### DESIGN

- Mobile and augmented reality technologies that support context-aware games
- Design of interactive wearable technologies that extend social and spatial boundaries of existing games and play experiences
- Novel interaction techniques appropriate for pervasive play
- Game mechanics and design patterns that support pervasive games and play experiences
- Pervasive game teardowns and case studies
- Techniques for developing and prototyping pervasive play experiences
- Toolkits for supporting pervasive play experiences

#### SOCIETY

- Application areas for pervasive play with positive social, physical, scientific, or educational purposes
- Opportunities and challenges that arise from bringing pervasive games into everyday life
- International and cross-cultural perspectives on pervasive play

### Workshop Schedule

(Morning Activities)

9:00–09:30 **Introduction by the organizers**

9:30–11:00 **Blitz Presentations by all participants**

11:00 Coffee Break

11:30–1:00 **Whole group “Big paper” activity**

#### Morning Activity Features:

In keeping with the primacy of space and mixed media in pervasive play experiences, workshop organizers will post “big paper” displays around the room that contain data culled from participant submissions (such as institutional affiliations, locations, skillsets, technologies used, and inspirational or seminal research). After the morning blitz, attendees will be invited to contribute to these living displays with post-it notes, sketches, and printed excerpts from their superhero trading cards. The process and artifacts of this thematic coding activity will be captured in photos, videos, and audio, to be curated and archived on the workshop website.

### Workshop Goals and Outcomes

Our workshop has three primary goals:

1. *Strengthen and broaden the community of pervasive play researchers and practitioners to promote future collaborations.*  
We will bring together a diverse mix of pervasive play researchers and designers to promote future collaborations. Prior to, during, and following our workshop, we plan to use our website to develop a hub to share researcher profiles; relevant publications, projects, and initiatives; and “worked examples” of pervasive games (see [1] for an example of this approach for a learning sciences community). Submissions from the workshop will be used to seed the website. While we see benefits of bringing together people working in all areas of pervasive play, we also recognize the need to promote small-group formation for proposal writing, data sharing, and co-authoring that will start during the workshop and continue afterward.
2. *Explore design frameworks for creating novel pervasive play experiences.*  
We will discuss strategies, tools, and processes used to create novel pervasive play experiences. We anticipate a subgroup of participants will further develop and release a shared framework and/or artifacts to foster new pervasive play experiences. This might, for example, take the form of a revised deck of cards to be used as design prompts (building off of [20] and [22]), design patterns for pervasive play (inspired by [4,7,13]), or a more structured framework that characterizes the key dimensions and choices when designing pervasive play experiences.

3. *Craft a research agenda for future projects, funding, and publications.*

As a group, we will identify key research questions, gaps in our knowledge, funding sources and priorities, and large-impact possibilities. A subset of workshop attendees, including the workshop organizers, will publish a summary of workshop findings in this area.

### Organizers (alphabetical order)

*June Ahn* is an Assistant Professor in the iSchool and College of Education at the University of Maryland, College Park. He also directs the Human-Computer Interaction Lab (HCIL). His research focuses on the design and study of learning technologies as they relate to aspects of students’ interest, identity, and knowledge development. His projects have examined the affordances of a variety of technologies, such as social media and games for learning.

*Elizabeth Bonsignore* is a PhD student at the University of Maryland. Her research focuses on the design of technology-mediated social experiences that promote new media literacies, arts-integrated science learning, and participatory cultures for youth. Most of her work involves co-design partnerships *with* youth. She is particularly interested in the role that multimodal narratives play in helping under-represented youth engage in life-long learning.

*Derek L. Hansen* is the Abell Professor of Innovation in the School of Technology at Brigham Young University. His research focuses on the design and evaluation of novel social technologies and games that promote pro-social causes in areas such as citizen science, STEM education, and exercise promotion.

## Workshop Schedule (Afternoon Activities)

1:00 Lunch

2:30–4:00 **Affinity Groups Discussion**

4:00 Coffee Break

4:30–6:00 **Developing the Pervasive Play Design Deck**

6:00 Dinner

7:30 **Post-workshop Research in Play Session**

### Afternoon Activity Features:

One possible outcome is a deck of cards that can serve as prompts for designing and analyzing pervasive play experiences. Like [20, 22], we envision the cards as a start for a framework of pervasive play design patterns.



*Kari Kraus* is an Associate Professor in the iSchool and the Department of English at the University of Maryland. Her research and teaching interests focus on new media and the digital humanities, preservation of video games and born-digital art and literature, transmedia storytelling, and speculative design.

*Carman Neustaedter* is an Associate Professor in the School of Interactive Arts and Technology at Simon Fraser University where he is the Director of the Connections Lab. His research explores games and social play amongst family and friends with an emphasis on location-based games, alternate reality games, and escape rooms. In this realm, he studies collocated and distributed collaboration, community and culture, and design processes and methods.

## Pervasiveplay.com Community Portal

We will develop a community portal at <http://pervasiveplay.com> for pervasive play researchers and practitioners to share personal profiles, an annotated bibliography, “worked examples” of pervasive games, and relevant events and news. The site will promote the workshop and share outcomes of from it, but will be publicly available to any interested parties. Prior to the workshop, the organizers and invited guests will update the site with weekly blog posts that help build common ground among potential participants by introducing relevant definitions, canonical articles, quotes from pervasive play experts, synopses of pervasive games and play experiences, and relevant news items.

## Pre-Workshop Plans

Because our proposed workshop aims to strengthen and expand on an interdisciplinary community of

pervasive play designers, researchers, and practitioners, we intend to invite 20–25 participants in academia, government, and industry from a diverse range of fields such as game studies, ubiquitous computing, learning sciences, digital humanities, electronic literature, film studies, interaction design, and HCI. We see our potential participants as experts in their respective fields, and our workshop as a forum for them to share and discuss their work, the challenges they have encountered, and the futures they envision around the design and implementation of pervasive play experiences.

We plan to recruit via numerous channels including (but not limited to) listservs and social media accounts tied to CHI-Announcements, CHI Play, Games4Change, Games, Learning, Society, #digitalhumanities on twitter, CSCW, UbiComp, PerCom, and ISMAR. We will also directly invite those who have published in the area of pervasive play, though we welcome newcomers who learn about the workshop from other sources. We have received preliminary interest from several researchers who are supportive of this workshop.

Inspired by Jane McGonigal’s advocacy for harnessing the “superpowers,” insights, and expertise of gamers [17], we ask applicants to submit the following variation on a workshop position paper in order to be invited as *Pervasive Players and Superheroes*:

- **Research Summary:** One page summary of current (or planned) projects that relate to our workshop themes. The summary should include details on how the applicants’ projects or research agendas connect to these themes, as well as links to resources, papers, software, or creative works (e.g., online

□ Pervasive Play during the workshop



Inspired by the use of balloons and other playful objects in previous CHI venues, the workshop will integrate playful means for participants to interact and physically engage with each other's ideas throughout the day (especially during the blitz and coding activity), such as using balloons, cheerful noise-makers, and various trading cards to highlight points at which participants make research connections with each other, raise or respond to ongoing questions, or uncover new areas for future work.

(Image credit: FixersUK, 2013, <https://www.flickr.com/photos/fixersuk/8783652034/>)

demos or design and programming resources on open source programming hubs such as GitHub).

- **Superpowers:** A short description of the applicant's "super powers," or skills, expertise, and background that can contribute to building and expanding upon a multidisciplinary pervasive play community (e.g., transmedia producer, game designer, mobile app expert, or player/user experience researcher). Applicants should specify the roles they see themselves currently playing, as well as those they aspire to. See Figure 1.
- **Inspirational Articles:** The suggestion of 1-3 articles, books, performances, or other works that have inspired them in the area of pervasive play. From the list of works that are submitted, we plan to build a reference library on the workshop website.

If design teams and/or organizations would like to apply with a combined project abstract, each member of these groups should submit a short description on the super powers they plan to engage during the workshop, and must contribute one to three inspirational articles to the community's annotated reference library (details below)

### Workshop Structure and Activities

This will be a one-day workshop. Activities will consist of blitz presentations (details below), followed by group activities and discussion. Attendees (with family and friends) will be invited to an informal evening social that includes pervasive play opportunities.

Morning: Workshop organizers will begin with a brief presentation that traces the history of pervasive play and situates it in relation to the fields of HCI and game

design. Next, each participant will give a blitz presentation that draws from their research summary, superpowers, and/or pervasive play studies that inspire them. Attendees will be encouraged to review each other's research summaries and superpower trading card details (posted on [pervasiveplay.com](http://pervasiveplay.com)) prior to rehearsing them. The morning activities (specifics in schedule sidebar) will be used to help identify major themes, trends, opportunities and challenges that exist or are emerging in pervasive play research and design. These activities will both reinforce the workshop's goal to strengthen and expand our pervasive play community and afford participants an opportunity to research partnerships.

Afternoon: Workshop participants will collaborate in their affinity groups to explore the most salient topics identified in the morning. Expected topics and issues include design characteristics of pervasive play, technologies and tools, and pro-social causes that can benefit from pervasive play designs. As in the morning session, the workshop aims to develop a concrete outcome in the afternoon: participants will co-design of a deck of cards that can act as prompts for designing and analyzing pervasive play experiences. Similar to the game design "Deck of Lenses" crafted by veteran game designer and researcher Jesse Schell [20], and inspired by a CHI 2015 workshop on play focused on children [15], we envision the cards as the start of a framework of design patterns for pervasive play.

### Post-Workshop Plans

In addition to the inaugural deck of pervasive play design cards, we plan to add a "worked example" section to the workshop website and open the online community to additional pervasive play researchers.

### Proposed Call for Participation

The infusion of mobile and collaborative technologies into our everyday lives enables new forms of pervasive games and play. We use the term *pervasive play* as shorthand for technology-mediated, playful experiences that are tethered to our everyday lives through the physical and virtual spaces we inhabit. It includes a variety of game and play genres ranging from alternate reality games to urban games to mixed reality performance and playful uses of public displays.

The goals of this 1-day workshop are to (a) strengthen and broaden the community of pervasive play researchers and practitioners, (b) explore design frameworks for creating novel pervasive play experiences, and (c) identify key research questions, methods, and challenges for future research in this area. Workshop participants will participate before and after the conference at [pervasiveplay.com](http://pervasiveplay.com) where weekly blog posts will build common ground and share relevant information. After the workshop, the site will be used to share the outcomes of the workshop and facilitate continued collaboration among participants and subgroups. The workshop itself will include blitz presentations by attendees, development of pervasive play design prompt and analysis cards, and affinity group discussions.

Prospective participants should submit a 1-page research summary of prior and current work, a short description of the submitters "superpowers" (as described at [pervasiveplay.com](http://pervasiveplay.com)), and 1-2 inspirational articles. Submissions to the workshop should be sent to Derek Hansen at [dlhansen@byu.edu](mailto:dlhansen@byu.edu) with the title "Pervasive Play Workshop Submission".

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