CHI 2015 Workshop “Embarrassing Interactions” Collected Papers

Sebastian Deterding, Andrès Lucero, Jussi Holopainen, Chulhong Min, Adrian Cheok, Annika Waern, and Steffen P. Walz
Embarrassing Interactions

Jon Back
The Embarrassing Act of Becoming a Street Performance Audience

Michael Greenberg
Public Online Failure With Crowdfunding

Myounghoon Jeon
Embarrassment as a Divergent Process for Creative Arts in the Immersive Virtual Environment

Ben Kirman, Sabine Harrer, Andrea Hasselager, Conor Linehan, Ida Toft and Raimund Schumacher
Cunt Touch This: A Conversation on Intimate Design and Embarrassment

Wei Eng Koh, Jocelyn Sie, Johnson Graham and Andrea Szymkowiak
Awkward Shopping: The Embarrassing & Embarrassed Ethnographer

Rob Mitchell
Embarrassing to Collaborate?

Nikhil Sharma
"Siri Thinks I Have Two Wives" & Other Embarrassing Voice Interactions

Annika Waern and Jaakko Stenros
Trust and Intimate Interaction in Nordic Larp

Gavin Wood and Madeline Balaam
Playing with Embarrassment

Matt Wood and Madeline Balaam
Art work: Blow Up Body Mapping (no paper)

Embarrassing Interactions

Sebastian Deterding
PlaIT Lab,
Northeastern University
Boston, MA, 02115, USA
deterding@neu.edu

Andrés Lucero
Mads Clausen Institute,
University of Southern
Denmark, DK-6000 Kolding,
Denmark
lucero@acm.org

Jussi Holopainen
GEElab, RMIT University
76131 Karlsruhe, Germany
jussi.holopainen@rmit.edu.au

Chulhong Min
KAIST Daejeon, 305-701,
Republic of Korea
chulhong@nclab.kaist.ac.kr

Adrian Cheok
City University London
EC1V 4PB, London, UK
adrian.cheok.1@city.ac.uk

Annika Waern
Uppsala University
Box 513, 751 20 Uppsala, SE
annika.waern@im.uu.se

Steffen Walz
GEElab, RMIT University
76131 Karlsruhe, Germany
steffen.walz@rmit.edu.au

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'15 Extended Abstracts, Apr 18-23 2015, Seoul, Republic of Korea
ACM 978-1-4503-3146-3/15/04.
http://dx.doi.org/10.1145/2702613.2702647

Abstract
Wherever the rapid evolution of interactive technologies disrupts standing situational norms, creates new, often unclear situational audiences, or crosses cultural boundaries, embarrassment is likely. This makes embarrassment a fundamental adoption and engagement hurdle, but also a creative design space for human-computer interaction. However, research on embarrassment in HCI has remained scattered and unsystematic so far. This workshop therefore convenes researchers and practitioners to assemble and advance the current state of research on embarrassing interactions.

Keywords
Embarrassment; shyness; intercultural HCI; cross-cultural UX

ACM Classification Keywords
H.5.m [Information Interfaces and Presentation] Miscellaneous; H.5.3 [Group and Organization Interfaces]: Theory and models.

Introduction
Embarrassment is a basic self-conscious, social emotion that arises when a person perceives that she is perceived to have behaved inappropriately or incompetently relative to her situational role expectations [13,17]. Embarrassment is centrally

involved in regulating social interaction, ensuring that individuals keep to situational norms and engage in repair and appeasement if they have broken them [8,9,25]. It is closely linked to shyness – avoiding engagement in social situations out of anxiety that one may lack competence to meet expectations and thus, embarrass oneself. Due to its rapid pace of innovation and change, human-computer interaction (HCI) is especially rife with embarrassment potential: Novel interactive technologies create new interactions, situations, and audiences with lacking, unclear, or even conflicting norms and role expectations.

Existing Work

One prominent example for this is context collapse [5]: because users can share information on social networking sites (SNS) across multiple typically distinct audiences in which individuals typically enact different roles and identities (workplace, family, friends), embarrassing "miscommunications" are common [14]. However, SNS are far from the only HCI arena where researchers observed embarrassment:

- the novelty of and thus lacking situational norms and scripts for interactive art installations generates "visitor shyness" [24];
- mobile telephony makes situationally inappropriate information accessible to bystanders, and leads callers to not appropriately regulate volume and content of their conversation [15,18,19];
- the novelty of human-robot interaction is a frequent source of embarrassment; conversely, robots that signal embarrassment are perceived as more sociable [7,10];
- online behavior tracking can lead to embarrassing targeted advertising displays and suggested content when others observe or use an individual's browser [1];
- many ubiquitous computing applications explore novel ways of users interacting and user activity being displayed in public, assuming and requiring extrovert users, disregarding shy users afraid of embarrassment potentials [2,3,6,16,22];
- on-body and erotic interfaces are so novel and intruding on social norms of personal space and intimate behavior that they require special design attention to ameliorate embarrassment [11,12,21,26];
- novel experimental, pervasive and body games explore embarrassment as a positive design goal [12,26,27], following the rationale that "uncomfortable interactions" [4] can have powerful artistic, educational, and political effects;
- different cultural norms of face and face saving make (computer-mediated) intercultural communication and interactive systems travelling across (and ignoring) cultural differences a common site of embarrassment [19,28].

In short, wherever novel HCI systems create lacking, unclear, or clashing situational norms or publics, shyness and embarrassment present likely sources of negative experience and hurdles to engagement and adoption, but also a productive artistic design space. Yet embarrassment has largely figured as a secondary research concern and surprising finding in HCI rather than as a subject of focused study. There has been no systematic attempt to bring together findings across domains, let alone focus on forms, conditions, or processes of embarrassment in HCI.

Workshop Goals

In light of this situation, the organizers of this workshop consider it high time to bring together researchers from different domains to jointly map the current state of research on embarrassment in HCI, and chart a future research agenda for its systematic study. Given that embarrassment is a process and emotion wound up in culturally shared social norms, and given that cross-cultural communication and technology use are a chief domain of embarrassing interactions, the location and theme of CHI 2015 provides an especially good opportunity for this topic, as it invites and allows dialogue and comparison across eastern and western cultures.

Workshop Questions

- What are causes, conditions, processes and forms of embarrassment in HCI?
- How does culture affect embarrassment in HCI? What cultural differences in embarrassment affect system design and use, and do these norms affect how systems from other source cultures are adopted and used? What are specifics of embarrassment in intercultural HCI?
- How does embarrassment impede adoption of and engagement with interactive systems?
- How can we mitigate (fear of) embarrassment as an undesired user experience?
- How we design for embarrassment as a desired experience in art, education, or activism?

Participants and Expected Interest

Exploring the current state of research on embarrassing interactions is of direct interest to all researchers and practitioners who study or have to grapple with (novel) interactive systems that might disrupt or render unclear standing situational norms and role expectations, especially if interaction has a (mediated) public: mobile communication; ubiquitous computing; computer-mediated intercultural communication; interactive art; experimental games; body interfaces; interaction in public settings; and social software. It also immediately speaks to researchers and practitioners in intercultural HCI, and anyone working on social computing or the social psychological dynamics of HCI more generally.

References

[1] Agarwal, L., Shrivastava, N., Jaiswal, S., and Panjwani, S. Do Not Embarrass: Re-Examining User Concerns for Online Tracking and Advertising. *SOUPS '13*, ACM Press (2013).

[2] Balaam, M. Designing for Social Connectedness in Shyness, Schools and Stroke Patients. *CHI'10 Social Connectedness Workshop*, (2010).

[3] Bedwell, B. and Caruana, T. Encouraging spectacle to create self-sustaining interactions at public displays. *PerDis '12*, ACM Press (2012), 1–6.

[4] Benford, S., Greenhalgh, C., Giannachi, G., Walker, B., Marshall, J., and Rodden, T. Uncomfortable interactions. *CHI '12*, ACM Press (2012), 2005–2014.

[5] Boyd, D. Taken Out of Context: American Teen Sociality in Networked Publicy. 2008.

[6] Chalmers, D., Fitzpatrick, G., Scott, S., and Wakeman, I. *Supporting Shy Users in Pervasive Computing (Full Proposal)*. Sussex, 2008.

[7] Choi, J.J., Kim, Y., and Kwak, S.S. Are You Embarrassed?: The Impact of Robot Types on Emotional Engagement with a Robot. *HRI'14*, ACM Press (2014), 138–139.1.

[8] Goffman, E. Embarrassment and Social Organization. *American Journal of Sociology 62*, 3 (1956), 264–271.

[9] Goffman, E. *Interaction Ritual: Essays on Face-to-Face Behavior*. Pantheon Books, New York, 1967.

[10] Han, B.S., Hong Yee Wong, A., and Li, H. Using design methodology to enhance interaction for a robotic receptionist. *RO-MAN'10*, IEEE (2010), 797–802.

[11] Hobye, M. and Löwgren, J. Touching a Stranger: Designing for Engaging Experience in Embodied Interaction. *International Journal of Design 5*, 3 (2011), 31–48.

[12] Huggard, A., Mel, A. De, Garner, J., Toprak, C.C., Chatham, A., and Mueller, F. Musical Embrace: Facilitating Engaging Play Experiences through Social Awkwardness. *CHI '13 EA*, (2013), 3067–3070.

[13] Keltner, D. and Buswell, B.N. Embarrassment: its distinct form and appeasement functions. *Psychological Bulletin 122*, 3 (1997), 250–70.

[14] Litt, E., et al. Awkward Encounters of an "Other" Kind: Collective Self-Presentation and Face Threat on Facebook. *CSCW'14*, ACM Press (2014), 449–460.

[15] Love, S. and Perry, M. Dealing with Mobile Conversations in Public Places: some implications for the design of socially intrusive technologies. *CHI'04*, ACM Press (2004), 1195–1198.

[16] Lucero, A., Holopainen, J. and Jokela, T. MobiComics: collaborative use of mobile phones and large displays for public expression. *MobileHCI '12*, ACM Press (2012), 383-392.

[17] Miller, R.S. *Embarrassment: Poise and Peril in Everyday Life*. The Guilford Press, New York, 1997.

[18] Min, C., Lee, Y., Pushp, S., et al. Uncovering embarrassing moments in in-situ exposure of incoming mobile messages. *UbiComp '14 Adjunct*, ACM Press (2014), 1045–1054.

[19] Monk, A., Carroll, J., Parker, S., and Blythe, M. Why are mobile phones annoying? *Behaviour & Information Technology 23*, 1 (2004), 33–41.

[20] Marcus, A. Cross-cultural user experience design. *SIGGRAPH Asia 2011 Courses*, ACM Press (2011).

[21] Profita, H., Clawson, J., Gilliland, S., et al. Don't Mind Me Touching My Wrist: A Case Study of Interacting with On-Body Technology in Public Social Acceptability of Wearable Technology. *ISWC'13*, ACM Press (2013), 89–96.

[22] Reeves, S. *Designing Interfaces in Public Settings: Understanding the Role of the Spectator in Human-Computer Interaction*. Springer, London, 2011.

[23] Rubin, K.H., Coplan, R.J., Bowker, J.C., and Menzer, M. Social withdrawal and shyness. In P.K. Smith and C. Hart, eds., *The Wiley-Blackwell Handbook of Childhood Social Development*. Wiley-Blackwell, Malden, MA, 2013, 434–452.

[24] Scott, S., Hinton-Smith, T., Härmä, V., and Broome, K. Goffman in the Gallery: Interactive Art and Visitor Shyness. *Symbolic Interaction 36*, 4 (2013), 417–438.

[25] Scheff, T.J. Shame and the Social Bond: A Sociological Theory. *Sociological Theory 18*, 1 (2000), 84–99.

[26] Segura, E.M., Waern, A., Moen, J., and Johansson, C. The Design Space of Body Games: Technological, Physical, and Social Design. *CHI'13*, ACM Press (2013), 3365–3374.

[27] Toprak, C.C., Platt, J., Ho, H.Y., and Mueller, F.F. Cart-Load-O-Fun: Designing Digital Games for Trams. *Fundamentals of Digital Gaming 2013*, (2013).

[28] Zhao, C., Street, D.L., and Hinds, P. How and To Whom People Share: The Role of Culture in Self-Disclosure in Online Communities. *CSCW'12*, ACM Press (2012), 67–76.

The Embarrassing Act of Becoming a Street Performance Audience

Jon Back
Uppsala University
Kyrkogårdsg. 10
Box 513
75120 Uppsala, Sweden
jon.back@im.uu.se

Abstract
The paper deals with engagement with information technology in public space by comparing it to how street performers deal with similar situations. One key example is presented. In this example, the importance of the difference between street-as-street and street-as-stage is presented, and the unease or embarrassment, this causes the audience is discussed.

Author Keywords
Street performance; engagement; embarrassment; public place

ACM Classification Keywords
H.5.m. Information interfaces and presentation: Misc.

Introduction
The urban street landscape is a malleable space, used for multiple purposes and shared between people that use it differently. As information technology is increasingly brought into focus in our everyday environment, we can expect it to play a role also in the various practices in the urban landscape. We are particularly interested in supporting disruptive and playful practices, as a means of empowerment in everyday life.

Example:
Arkadia Trying to Get an Anchor

Arkadia is setting up his equipment. The people who are to become his 'anchor' walk past. The performer has not yet noticed them (or at least not acknowledged that he has).

The performer makes a sound (a combination of laughter and applauds) on his sound system. The potential 'anchors' stop and turn around to watch.

However, subjecting oneself to being the first revolutionary is endeavouring and embarrassing. In this paper, we look into how street performers engage with their audience as a way to re-shape public space into a scene, and in particular on how audiences respond and co-create the scene. The work builds on previous studies of street performers in Covent Garden [3,4], studies of crowds and spectators [10,11], as well as practitioner knowledge from within the field of street performance [2,9,12]. Most of this work focuses on the performers. In this article, we instead focus on how audiences react and respond to the performer.

Usually, the (pedestrian) street is used for certain purposes, like walking, window-shopping and talking to friends. Performers, on the other hand, use the street for something out of the ordinary, creating a stage to perform a show. If someone decides to stop and watch that show they are, together with the performer and the rest of the audience, creating a new use of that street. They socially construct a stage for the performer to perform on. This can be tied to an understanding of physical space as being socially constructed [6,7,8]. Based in Goffman [5], "embarrassment has to do with unfulfilled expectations". When a participant senses what *ought* to be appropriate, even though it does not occur, this can create a feeling of unease or embarrassment. This happens with the first members of the audience, the ones who are among the first to stop to watch that show. These frequently seem to be uncomfortable, or embarrassed, as there is yet no common understanding of the street as a stage. At this time, the street *ought* to be used for walking or other street activities. Later, when the audience starts forming, the people who stop instead become part of a group, and the space becomes more easily understood as a temporary stage. This behaviour can be compared to other work, primarily on public displays, where people attracting more people has been referred to as the honeypot effect [1]. Unlike public displays, the street performers can interact directly with their audience, and not only through a set interface.

The reported study uses an ethnographic approach, meeting with, observing, interviewing and to some extent working with street performers. To be able to study the actual shows in detail, audio and video recordings have been made from several occasions. In this article the focus is on only one specific video recording, used as an example to inform the reader.

A 'Typical' Performance

There are different types of shows, but most of them follow a similar basic structure. A typical performance starts with the performer setting up. Already at this point the performer makes noises, such as holding a monologue, playing music, or honking a horn. The space that is intended to become a stage is marked out, and the first curious people slow down to see what is happening. Next, the performer connects with an 'anchor', the first secured audience member. As the anchor and the continued performance attracts the interest of more and more people, the next step is to form an 'edge', the first full line of audience. At this point, the performer initiates the real performance, the main part of the show, moving towards a finale and finally delivering 'hat-lines' (talking about being paid). When the finale is concluded, the hat is passed around. In this paper, we focus on the methods used to get the first audience to stop (securing 'the anchor') and the first formation of a 'real' audience (forming 'the edge'),

As the performer turn away and continue to notice other people they stay on, this goes on for 30 seconds, after which he turns back to them saying ”I have to do something…”

The performer puts down his ropes (to form the stage), while the potential anchors stay and watch. As he finishes, he turn to his audience (or rather to where there would be an audience if they had gathered yet), saying with a loud voice:

and on how the audience handles the uncomfortable situation of *maybe* watching a show.

An example: Arkadia in Stockholm

This example is a show with a street performer named ‘Arkadia’. The performance was recorded in the Old Town of Stockholm on a day when several performers decided to go out together. In the recordings, some of the performers are visible watching this show. This is unusual in the common decision to go together, but as a few places are seen as the best, it is not uncommon for several performers to end up in the same spot.

Getting the Anchor

The first interesting observation in this example is that Arkadia makes two attempts at creating an anchor. The first fails, and the second succeed. In both situations, there is a group of two, in the first a male and a female in their twenties, in the second two female teenagers. Both times, the (potential) audience members walk past the spot of the performance, gradually slowing down while matching the speed to their company. They eventually stop about five meters away from the performer. The performer has put ropes on the ground, marking his planned stage area, and both groups stop a couple of meters away from the ropes. At the time of stopping, the performer has not yet contacted them.

In the first (failed) attempt, the performer approaches the audience by nodding and waving to them. He then raises his voice and presents to the generic (but yet fictive) audience: “Ladies and gentlemen, in a couple of minutes on this very place [short pause] a show is about to begin.” This is when one of the potential anchors turns around (slowly as to see if the other will follow) and walks away.

In the second (succeeding) attempt, the performer (while talking loud for himself) says that a show is about to begin in a couple of minutes. Right after, he turns to the group that already has stopped, looks at them and says: “Oh, hello, where are you from?”

There seems to be two main differences between the two situations: First, in the successful attempt, the performer has already stated that the show has not yet started and that it will take a couple of minutes, before he engages in social interaction. This group is thus informed about what is going on before engaging with the performer. Furthermore, in the succeeding attempt the audience is forced into social interaction by answering a question. In the failed attempt, they do not interact with the performer apart from a slight nod, acknowledging that they are watching him.

Forming the Edge

Once the anchor is in place people seem to be more willing to stop, and the performer does not give everyone personal attention. Still, similar interactions to the previous more detail examples occur. Most people stop by gradually slowing down from walking, rather than stopping completely and resolute. Very few move right up to the performance, but rather stay some distance away. A common behaviour is to stop to watch while pretending to do something else. In other video recordings, we found groups of people window-shopping on the opposite side of the (walking) street, looking a little bit into the window but mostly at the performance, as an uncommitted way to watch the show. When these individuals were approached by the performer, who typically would ask them to move closer, most would either do as they were asked or leave the performance altogether. A third type of

– I'm going to try to get those laughs for real.

(Raising his voice)

– Ladies and gentlemen, in a couple of minutes on this very place [short pause] a show is about to begin.

[Speech goes on to describe what is going to happen]

The performer start this speech turned towards the anchors part of the invisible audience and turned around towards the left during it. On the word 'about', the potential anchors move away, starting with the male, who starts to turn his head as the word 'place' is uttered.

audience members stayed back but was still committed to watching the show. These people stayed in place when they were asked to come closer, but still interact by shaking their heads in response to the request.

The Semi-Audience as a Performance

What we see from the examples above is that there is a performance aspect to being an audience in the street. As someone just walking by a street performance the act of joining an audience, and thereby helping to treat the street as a stage rather than a street, is out of the ordinary and draws attention. Hence, the act of watching may become uncomfortable. It is unclear how this should be done, as the street is not what it *ought* to be [5]. This is particularly true for the early audience that are watching a show that does not yet exist.

In the video material, three different 'levels' of audience can be discerned. The 'first row' is the people standing by the rope. They actively perform being the audience and will interact with the performer. The 'second row', standing further behind, consists of people who have not yet decided to stay or move on. They are clearly watching the show but are less committed to it. Finally, the 'lurkers' stand in the background. They acknowledge there is a performance going on, but are unwilling to participate. In order to stay out of being an audience, they move in and out of focusing on the performance. The participation model sketched here has similarities to the 'honeypot effect' documented for public interactive screens, and the levels of engagement can be compared to the different modes of engagement with those displays (direct interaction, focal awareness, and peripheral awareness) [1]. The engagement in the performance and the physical proximity of the audience to the performer seems to be related. Where an audience member in the first row can be talked to, joked with and so on, the people behind are harder to get to interact. This is an area that could be further explored in future work.

References

[1] Brignull, H. and Rogers, Y. Enticing people to interact with large public displays in public spaces. *Proc. INTERACT*, (2003), 17–24.

[2] Cellini, J. *The Art of Street Performing*. 2004.

[3] Gardair, C., Healey, P.G.T., and Welton, M. Performing places. *Proc. Creativity and Cognition*, ACM (2011), 51–60.

[4] Gardair, C. Assembling Audiences. 2013.

[5] Goffman, E. Embarrassment and social organization. *American Journal of Sociology*, (1956), 264–271.

[6] Goffman, E. The presentation of self in everyday life. 1959. *Garden City, NY*, (2002).

[7] Harrison, S. and Dourish, P. Re-place-ing Space: The Roles of Place and Space in Collaborative Systems. *Proc. CSCW*, ACM (1996), 67–76.

[8] Harrison, S. and Tatar, D. Places: people, events, loci–the relation of semantic frames in the construction of place. *CSCW 17*, 2-3 (2008), 97–133.

[9] Hustle, D., Wells, J.E., and Gazzo. *The Art of Krowd Keeping*. Penguin Magic, 2006.

[10] Reeves, S., Benford, S., O'Malley, C., and Fraser, M. Designing the Spectator Experience. *Proc. CHI*, ACM (2005), 741–750.

[11] Reeves, S., Sherwood, S., and Brown, B. Designing for crowds. *Proc. NordiCHI*, (2010), 393–402.

[12] Talksalot, J. *To Lure With Spectacle and Our Mysterious Society*. Leaping Lizard Publishing, Orlando, FL, 2007.

Public Online Failure With Crowdfunding

Michael Greenberg
Northwestern University
2133 N. Sheridan Rd
Evanston, IL 60652, USA
mdgreenb@u.northwestern.edu

Paste the appropriate copyright statement here. ACM now supports three different copyright statements:
• ACM copyright: ACM holds the copyright on the work. This is the historical approach.
• License: The author(s) retain copyright, but ACM receives an exclusive publication license.
• Open Access: The author(s) wish to pay for the work to be open access. The additional fee must be paid to ACM.
This text field is large enough to hold the appropriate release statement assuming it is single spaced.
Every submission will be assigned their own unique DOI string to be included here.

Abstract
Kickstarter is a growing online crowdfunding platform where individuals attempt to raise funds for creative projects by leveraging their personal social networks for small financial contributions. Crowdfunding platforms like Kickstarter are actively growing, with thousands of individuals attempting projects each month. While other scholarly research and the popular press has focused on the success stories from crowdfunding, the fact remains that a majority of projects fail. Little attention has focused on the majority of individuals who have run failed projects and experienced a publicly embarrassing event in the process. We see crowdfunding platforms as a unique opportunity to study and understand how individuals react to online embarrassment.

ACM Classification Keywords
H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous.

Introduction
In the Spring of 2013, Chris Dickens, an entrepreneur from California raised over $2,989 via contributions from 72 individuals on Kickstarter.com to fund the production of "The Vigilante Project," an independent comic book. However, this was not Chris's first attempt at fundraising on Kickstarter. Just two months prior, an earlier iteration

of the same project failed to meet its funding goal, gathering contributions from only 35 individuals. Chris was undeterred after his first failure. Bolstered by social support from peers, he committed to the mission of the project by keeping his supporters updated on his progress as he refactored and prepared to try again. And after his second attempt at the project was successful, Chris has remained an active member of the Kickstarter community by financially supporting the projects of nine others. Chris's case is atypical for participants on Kickstarter, as only 3% of failed projects creators attempt to relaunch their project [4]. As such, we position crowdfunding platforms like Kickstarter as a unique location to study how individuals react to the embarrassing experience of online failure.

Theoretical Framing

Since failure is often part of a longer creative process, this begs the following question: what might motivate people like Chris who have failed to return to crowdfunding? While the process of creative expression is often characterized by a series of failures on the way to an eventual success [1], we have observed through previous work that Kickstarter actively does not support the process of iterative failure necessary for creative work [4]. On Kickstarter, roughly 50% of projects fail, however only 3.8% of failed projects eventually relaunch and try again [4] If platforms like Kickstarter represent the way that individuals will get started with creative work in the future, then we have a responsibility to understand the publicly embarrassing experience of failure on these platforms and to design for it.

The future of online creative entrepreneurship and creative work might hinge on supporting failure within these platforms more effectively, since the failures are highly visible to social networks and persist even after the project has ended. Related work from entereprenurship studies has described a theory of how entrepreneurs persistence through failure through a solitary process [5], however the online environment is highly social and provides numerous avenues for feedback from peers [3]. So while participating in these platforms might be cheaper in the sense of monetary costs to participate, failure is potentially more costly in the sense of social costs [2]. Therefore we are doubly concerned with supporting failure within these platforms; not only is failure a critical part of the creative process, if not handled correctly, it can have severe detrimental effects in an online environment. We argue that in order for Kickstarter and other, future creative work platforms like Kickstarter to avoid stagnating user growth, they must be designed with the experience of iterative failure in mind.

It is inevitable on platforms like Kickstarter, or any creative platform for that matter, that a certain percentage of the population will experience a failure before an eventual success. While previous research on crowdfunding showed that failure was often seen as a positive experience for project creators, the overwhelming majority of failed project creators do not return to their project [4]. We wonder then, why do people fail to return in any form? While in some extreme cases, failure can lead to stigmatization from further participation, a general failure to design for the experience of failure might manifest itself as a problem with user retention. This in turn might lead to a decline in participation on these platforms.

Furthermore, the story of Chris Dickens is just one example of how the Internet allows novices to pursue creative interests with minimal mediation. While the

minimal mediation of Internet platforms allows anybody the opportunity to start creative work, it especially helps novices who may not have existing networks of supporters. In addition, novices are inexperienced and have a high chance of failure. As these novice users represent the future of participants on these creative platforms, it is important to support them as they begin to participate, so as not to marginalize them before they can become experienced members of the community.

So while platforms like Kickstarter have emerged where people engage in creative ventures online, we know little about why creators fail to return and what can motivate individuals to come back after a failure event. Chris Dickens is an outlier in a community of abandoned projects, and we know very little about what makes his case different from the majority of project creators. We address this gap.

Results

Our previous work has shown that people find the experience of failing with crowdfunding to be embarrassing, yet rewarding at the same time [4]. In this work, where we interviewed 11 individuals who had run failed crowdfunding campaigns, everyone we interviewed responded that at least some part of the failure experience was positive. At the extremes, one individual described the experience of failure with crowdfunding as deeply disturbing "Oh my god, I lost confidence in myself and .... I was really disappointed. It became too personal for me...". After three failure events this person was unwilling to attempt crowdfunding again, however they did report that they learned important skills in the process of failure. At the other end of the spectrum, others had largely positive experiences with failure events: "I dont want to be cheesy but it made me stronger. It made me stronger in that I found different ways to connect with my audience... So, hopefully people are learning. People that fail learn and reevaluate, I know I did." This individual used the embarrassing experience of failure as a learning experience and eventually launched a successful next campaign.

In future work we will study user retention after failure on Kickstarter as, we are interested in why people return after embarrassing creative failure online. We posit that HCI can contribute to this important problem by testing and designing interfaces which promote both social encouragement and individual persistence, both of which might help individuals to continue participating after and embarrassing failure. We argue that there is much to study in this important domain, which will become increasingly important in the coming years.

References

[1] Barron, F., and Harrington, D. M. Creativity, intelligence, and personality. *Annual review of psychology 32*, 1 (1981), 439–476.

[2] Burke, M., Kraut, R., and Marlow, C. Social capital on facebook: Differentiating uses and users. In *CHI 2011*, ACM (2011), 571–580. 00159.

[3] Burke, M., Marlow, C., and Lento, T. Feed me: motivating newcomer contribution in social network sites. In *CHI 2009*, ACM (2009), 945–954.

[4] Greenberg, M. D., and Gerber, E. M. Learning to fail: Experiencing public failure online through crowdfunding. In *CHI 2014*, CHI '14, ACM (New York, NY, USA, 2014), 581–590.

[5] Singh, S., Corner, P. D., and Pavlovich, K. Failed, not finished: A narrative approach to understanding venture failure stigmatization. *Journal of Business Venturing 30*, 1 (Jan. 2015), 150–166.

Embarrassment as a Divergent Process for Creative Arts in the Immersive Virtual Environment

Myounghoon Jeon
Mind Music Machine Lab
Department of Cognitive and Learning Sciences
Department of Computer Science
Michigan Technological University
Houghton, MI 49931 USA
mjeon@mtu.edu

Paste the appropriate copyright/license statement here. ACM now supports three different publication options:

- ACM copyright: ACM holds the copyright on the work. This is the historical approach.
- License: The author(s) retain copyright, but ACM receives an exclusive publication license.
- Open Access: The author(s) wish to pay for the work to be open access. The additional fee must be paid to ACM.

This text field is large enough to hold the appropriate release statement assuming it is single-spaced in Verdana 7 point font. Please do not change the size of this text box.
Every submission will be assigned their own unique DOI string to be included here.

Abstract
In our virtual environment studio at Michigan Tech, a performing artist makes analog and digital penwald drawings, lying down on a huge canvas, dancers create music and visuals by dancing, and children and a puppy make interactive arts together. In each case, there are different embarrassing moments (e.g., how, what, and who) to audience and even an artist. However, those embarrassing moments are real points that "make arts arts". Our works are highlighted in the line of embarrassing points of traditional arts and implications of embarrassment for design research are discussed.

Author Keywords
creativity; divergent thinking; interactive sonification; virtual environment

ACM Classification Keywords
H.5.5. **[Sound and Music Computing]**: Methodologies and Techniques

Introduction
The concept of art has been rapidly changing. More accurately, the value of particular artists after Duchamp can be weighed according to "how much they questioned the nature of art" or "what they added to

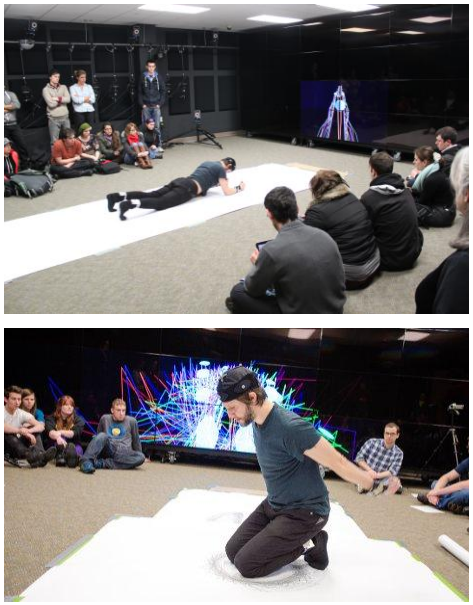

Figure 1. Penwald drawing. The unconventional ways (how) of his embodied drawing embarrass audience.

the conception of art" [Kosuth, 1969 cited in 1]. Since then, the history of arts has demonstrated that breaking social norms, stereotypes, and role expectations defines arts, by *embarrassing* critics and audience. Considering that the original meaning of aesthetics is the study of our perception of the entire environment (not just of an "object of beauty") [2], we are likely to acknowledge that technological advances have accelerated the advent of new aesthetics. More dramatically than futurists envisioned, arts and technologies have been *re*integrated in the contemporary art [3] and technologies have enabled embarrassing points in arts even more. The present paper describes in our immersive virtual environment, how technologies encourage and enable (1) artists to shift how they do arts, (2) artists to change and integrate their expected role with unexpected roles, and (3) children and animals to be involved in the artistic process, all of which are new variations of embarrassment of the art history.

Virtual Environment System Configuration

Taking embodied interaction and interactive sonification into account, we have developed a novel immersive interactive sonification platform, "iISop" at Immersive Visualization Studio (IVS) at Michigan Tech [4]. The iISoP features a Vicon tracking system utilizing 12 infrared cameras that track users' location, movement, and gesture, using specific reflective objects that are strapped to users' body parts (e.g., arms, legs, hat, etc.). A display wall visualizes corresponding graphical user interfaces (GUIs) written in C++ using the OpenGL framework. The display wall consists of 24 (6x4) 42" multivision monitors controlled by 8 computers that display representations of the tracked objects in real time. Position, velocity, acceleration, time, proximity to other objects, and holistic affective gestures are recorded and analyzed to generate appropriate sounds (speech, non-speech, music, etc.) based on our own sonification algorithms programmed in JAVA (JFugue Library). For more details of the system configuration, see [4].

Embarrassment at How

The first project to show "how our technology shifts the way artists do arts" is the collaboration with a performing artist, Tony Orrico. In our Mind Music Machine lab, Orrico demonstrated two types of penwald drawing pieces, wearing sensors that made real-time visualization and sonification. For one piece (Figure. 1 top), he laid his face down on a huge piece of paper on the ground, holding graphite pencils in both hands. He pushed off a wall, jetting himself forward on top of the piece. He dragged his graphite pencils along with him; as he writhed his way back to the starting position over and over again, he left behind himself a pictorial history of his motion. For the second piece (Figure. 1 bottom), Orrico knelt on a large sheet of paper, striking it with graphite as he swung his arms in a pendular motion, and slowly revolved atop the mat. While he was drawing these pieces on the paper canvas, his movements created digitalized drawings on the virtual canvas (multivisions). Putting the canvas on the floor or drawing with the artist's entire body made our audience embarrassed, but the ideas are not totally new. In 1940-50s, Jackson Pollock put the canvas on the floor instead of an easel. Nam June Paik laid his face down on a big canvas and drew using his hair in his masterpiece "Zen for Head" (1962). They showed extreme gestures of the body, broke the traditional form, entered the inside of the drawing because of its huge scale, and thus, their work was not limited to the canvas, but expanded to the entire space of the room [5]. In the same line, we added a tracking camera and

Figure 2. Dance-based sonification. The unconventional outcomes (visuals and sounds) of dancing embarrass audience.

gained a tweaked version of digitalized master pieces. The data – the artist's (i.e., an expert's) body motion – recorded during the performances are crucial to a deeper understanding of how an expert functions. The data could contribute to designing an expert system that can help untrained adults or children do arts. We analyze their behavior patterns, processes, error-correction, and do data mining, and utilize those data in terms of training novices or having them create arts without any training or learning. We can create visualization or sonification by translating novices' basic (artistically non-meaningful) activities into meaningful outcomes.

Embarrassment at What

The second project to show "how our technology change and integrate artists' expected role with unexpected roles" is the dance-based sonification project. The ultimate goal of this project is to have dancers improvise music and visuals by their dancing. Dancers still play an expected role (dance), but simultaneously integrate unexpected roles (improvise music and visuals). From the traditional perspective, this might embarrass dancers and audience, but certainly adds aesthetic dimensions to their work.

In this project, we adopted emotions and affect as the medium of communication between gestures and sounds. To maximize affective gesture expression, expert dancers have been recruited to dance, move, and gesture inside the iISoP system while being given both visual and auditory outputs in real time. A combination of Laban Movement Analysis and affective gesturing was implemented for the sonification parameter algorithms [6]. In a top down affective dimensional design, four basic emotions were considered first: angry, happy, sad, and content. Each basic emotion is represented on a two dimensional coordinate plane with axes of activity and valence [7]. For the recognition of these four affective states, personal space and movement effort are interpreted by the Vicon tracking system and utilized by the visualization and sonification algorithms. An example of the sonification logic would be high effort and high personal space (e.g., content) results in raising the octave of the audio output, changing to an instrument with a brighter timbre, increase in volume speed and stochasticity at which the notes are played. This fusion of different genres of arts gathers norms and rules of each genre, and thus, contributes to creating a new convergent process as well as a divergent process.

Embarrassment at Who

The third project to show "how our technology expands the subject of arts" is an on-going children-robots-animals interaction project. Since 1960s' *happening* [8], integrating the audience as a key part of the artwork has been a crucial milestone. With the technology that facilitates this collaboration, we wanted to go one step further, by making audience the subject of arts. Children have been recruited to either control remote controlled drones, interact with autonomously moving robots (e.g., Darwin, Romo, etc.), or even play fetch with a puppy inside the iISoP (Figure 3). Children try to control those, but they have their own intentionality (i.e., control-display ratio of the drone, autonomy of the robot, and the puppy's own will). Based on the specific mapping parameters, visual and auditory outputs are displayed to represent current position and kinetic characteristics of all players. A philosophical question about "intentionality" of Cognitive Science is explored with respect to a main agent of composition, such as "who is controlling/composing music and sound, the child,

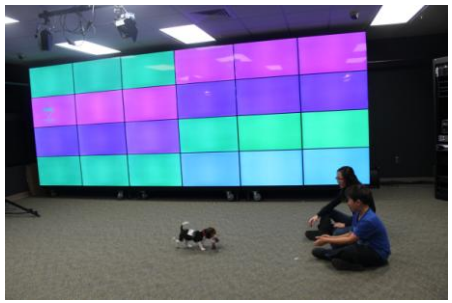

Figure 3. Children-animal interaction. The unconventional subject/agent of artworks embarrass audience. Their unexpected behaviors and outcomes even embarrass a producer and an artist.

robot, animal, or programmer?"

To analyze contemporary arts in this era, Mitchell [9] proposed a new aesthetic framework, the "biocybernetic reproduction", which can be defined as "the combination of computer technology and biological science that makes cloning and genetic engineering possible" (p.483). However, it can refer to the new technical media that are transforming the conditions of all living organisms in its broader sense. The word "cybernetics" stems from the Greek word, "steersman" of a boat and thus, suggests a discipline of "control and governance" [10]. Based on that, cybernetics is "the entire field of control and communication theory," whether in the machine or animal. Then, "bios" refers to the sphere of living organisms which are to be subjected to control, but also resist the control [9]. Taken together, biocybernetics refers to the field of control and communication; and yet simultaneously, it relates to the resistance to control and communication. Therefore, it innately embarrasses artists and audience but simultaneously encourages artistic inspiration just because of that resistance. Here, animals serve not as an object, but as a subject of the art work. The music score for children-animal interaction could be like ||: Go fetch! :|| This piece looks like a repetition, but it will likely generate different music patterns because of a puppy's autonomous behavior at every time, which is referred to as the biocybernetic reproduction.

Conclusion and Future Works

Our goal was to make a design research platform that allows researchers to conduct all of the artistic experimental research in a single platform. Faste and Faste [11] proposed a new framework of the relationship between design and research. Among their framework, we focus on "Research through Design" or embedded design research, in which designers practice their craft to seek new knowledge and to gain insight for the possible outcomes. We believe artists' and designers' novel embarrassing processes can pose unique questions and thus, inspire researchers' future directions. To devise a fully interactive system, we cautiously review the possibility of anthropomorphism of the iISoP. To this end, it needs to evolve further with higher intellectual capability.

References

[1] Kac, E. *Telepresence art*. Kulturdata. accessed in March 2014. R. Kriesche (ed.), Teleskulptul, Graz, Austria, 1993. http://www.ekac.org/telepresence.art_94.html,

[2] Bolter, J. D., Engberg, M. and MacIntyre, B. Media studies, mobile augmented reality, and interaction design. *Interaction* 20, 1 (2013), 36-45.

[3] Packer, R. and Jordan, K. *Multimedia: From Wagner to Virtual Reality*. W.W.Norton&Company, New York, 2001.

[4] Jeon, M., Smith, M. T., Walker, J. W. and Kuhl, A. S. Constructing the immersive interactive sonification platform (iISoP) *Proc. HCII2014 (2014)*.

[5] Kaprow, A. *The legacy of Jackson Pollock (1958)*. In J. Kelly (Ed.), Allan Kaprow: Essays on the blurring of art and life. (pp. 1-9). The University of California Press, CA. 1993.

[6] Camurri, A., Lagerlöf, I. and Volpe, G. Recognizing emotion from dance movement: comparison of spectator recognition and automated techniques. *International Journal of Human-Computer Studies* 59, 1 (2003), 213-225.

[7] Kapur, A., Kapur, A., Virji-Babul, N., Tzanetakis, G. and Driessen, P. F. *Gesture-based affective computing on motion capture data*. *Proc. ACII2005* (2005).

[8] Carvalho, R. The magical features of immersive audiovisual environments. *Interaction* XX, 5 (2013), 32-37.

[9] Mitchell, W. J. T. The work of art in the age of biocybernetic reproduction. *MODERNISM / modernity* 10, 3 (2003), 481-500.

[10] Wiener, N. *Cybernetics*. John Wiley and Sons, Inc., New York, 1948.

[11] Faste, T. and Faste, H. *Demystifying "design research": design is not research, research is design*. *Proc. IDSA 2012* (2012).

Short Bio

Philart is an Assistant Professor of Cognitive Science and Computer Science at Michigan Tech. He received his PhD in sonification from Georgia Tech. His resesarch yielded more than 100 publications. As a former professional sound designer, he has worked for LG, Samsung, GE Electric, Hyundai-Kia Motors Company, Toyota, etc.

Cunt Touch This: A Conversation on Intimate Design and Embarrassment

Ben Kirman
Lincoln Social Computing (LiSC)
Research Centre
University of Lincoln
Lincoln LN6 7TS, UK
bkirman@lincoln.ac.uk

Conor Linehan
Lincoln Social Computing (LiSC)
Research Centre
University of Lincoln
Lincoln LN6 7TS, UK
clinehan@lincoln.ac.uk

Sabine Harrer
University of Vienna
Department of English Studies
Spitalgasse 2-4/Campus Hof 8.3
1090 Vienna, Austria
sabine.harrer@univie.ac.at

Ida Toft
Concordia University
1455 De Maisonneuve Blvd W.
Montreal, Quebec,
Canada
i_tof@concordia.ca

Andrea Hasselager
Freelance Artist & Game Designer
andrea.hasselager@gmail.com

Raimund Schumacher
Freelance Graphic Artist
sr@conspirat.com

Paste the appropriate copyright/license statement here. ACM now supports three different publication options:

- ACM copyright: ACM holds the copyright on the work. This is the historical approach.
- License: The author(s) retain copyright, but ACM receives an exclusive publication license.
- Open Access: The author(s) wish to pay for the work to be open access. The additional fee must be paid to ACM.

This text field is large enough to hold the appropriate release statement assuming it is single-spaced in Verdana 7 point font. Please do not change the size of this text box.
Every submission will be assigned their own unique DOI string to be included here.

Abstract

This position paper presents a conversation between players and the designers of the unique mobile game experience *Cunt Touch This*[1].

Revisiting their personal experiences with playing the game, the player-authors read the game as a system that takes advantage of social embarrassment as a key element from which the pleasure of the game is derived. Contrasting this view, the designer-authors comment on the original intention, production context and purpose of *Cunt Touch This*. The goal of this confrontation is to explore embarrassment as a feeling oscillating between the emotional and the political dimensions of play. The unusual discussion format of the paper allows us to invite potentially challenging questions: When, where and why does embarrassment come about? What function does it have in play? Is it just part of the fun, or ideologically charged? Drawing together our differing perspectives as players and designers we contribute a candid reflection on the wider issues of embarrassment as it relates to design.

Author Keywords

Game design; embarrassment; pleasure

ACM Classification Keywords

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

[1] http://www.copenhagengamecollective.org/projects/cunttouchthis/

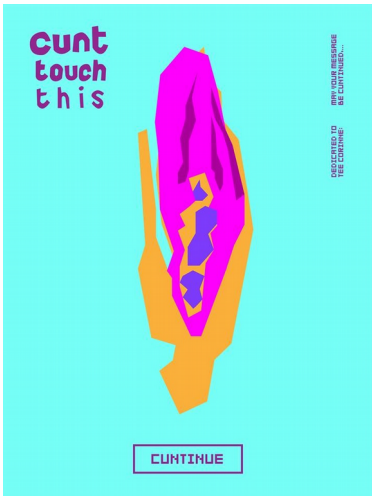

Figure 1: Game Visuals

Introduction

[Ben - player] It was late on a Monday night after a long day at a workshop, and we were in the only open bar in Nottingham. A colleague eagerly called me over to play a new game. Sabine handed me the tablet – the title screen showing a colourful abstract logo announcing "CUNT TOUCH THIS" - and with a small group of widely-grinning onlookers I started to play.

[Designers] *Cunt Touch This* is inspired by Tee A. Corinne's Cunt Coloring Book from 1975 [1]. The game is a meditative drawing activity accompanied by audio feedback. Using fingers on a touchpad players can admire, care for and add their own artistic colouring to the detailed shapes of Corinne's drawings. Pacing of strokes is important for the aesthetic look: slow strokes create thick colour lines while fast strokes add a coarse graffiti style. Randomly placed sensitive areas respond to the touch: Careful work around these gives more time to draw, while too much interaction will cause the image to pulsate in a slow motion cunt explosion before the image fades to white leaving the message "thank you, it was a pleasure". The option "Cuntinue?" invites the players to encounter new levels. Sensitivity area and pleasure length on each vulva are unique just like each drawing shows the diversity of female bodies.

[Ben] When I later received an invite for the workshop on embarrassing interactions my immediate thought was of my experience playing, and watching others play, *Cunt Touch This* in that bar in Nottingham. I excitedly emailed the designers, to ask if they'd be interested in collaborating on a paper. The ensuing discussion was challenging, varied and illuminating reflection on intimacy and embarrassment as an aspect of interaction design that will be of value to anyone studying or designing in this space.

The Game

[Designers] The mission of the Cunt Coloring Book is to demystify female sexuality and drawing attention to its diversity in a fun, artistic way. Readers are not only invited to admire, but also to "make it their own" by colourising the detailed shapes Corinne displays. This pleasure-centric approach to the cunt has inspired the design of *Cunt Touch This*. Each level features one of Corinne's artistically designed vulvas, which can be coloured, using a finger on the touchpad and the small, dynamic colour wheel on the bottom of the screen. There are randomly distributed sensitive areas which will respond to touch, and pacing one's movements carefully is important, as the speed of the strokes determines whether the colour is applied. That way, the duration as well as the purpose of a painting session can be controlled by players: Whether they choose to rush towards climax or to spend more time with one of Corinne's other available cunt drawings, is up to them. In any case, there are different vulva shapes waiting for players to explore, customise and playfully own.

We made *Cunt Touch This* at a small Danish game jam in spring 2014 in a team of 4. Andrea happened to have Corinne's drawing book on her, and while we started admiring the beauty of her drawings in the way they playfully celebrate female sexuality, we started wondering how her work would look like in a game. Raimund enthusiastically joined the team as a graphical artist, and Ida started programming. When we introduced *Cunt Touch This* at the game jam's final presentation, we found that it seemed to cause some fair amount of confusion among players. This is best reflected in the award that it eventually received: "least/best feministic [sic!] game"[2]

[2] http://www.igda.dk/2014/05/08/bonfires-jamming-baking-and-more-happened-at-exile-spring-2014/

The Player Experience

[Ben] I think the first feeling I had was that of cold panic. You are faced with this extremely detailed vulva. You are surrounded by friends and colleagues looking over your shoulders. I felt there was an expectation to perform. My first thought was to my surroundings – how do I “win” this without losing face? I consciously tried to desexualise it by earnestly colouring, but as soon as you start touching the screen the moaning sound effects reinforce the sexual aspect of the gameplay. I chickened out pretty quickly by trying to be funny and putting a smiley face on the vagina.

[Conor] It was definitely a memorable experience. When presented with the game you just see an outline picture and a drawing tool. The instructions were straightforward – colour in the picture. However, I was very suspicious that there had to be something more involved as spectators had raised eyebrows and were giving each other knowing looks. I guessed that the movements of my fingers on the touchscreen were probably being measured and that something would happen as a result. I also felt very keenly, whether it was true or not, that the spectators were watching those finger movements. I tried to convince myself that this was completely normal- the same as colouring in any other body part. But I also didn’t really want to be seen as acting overtly sexually in front of colleagues at a public bar, so I was very aware of my movements. Given the social context of playing in public, the close topographical similarity between the colouring action and a sexual act, the wish not to react to the content of the colouring, and yet the desire to complete the game, this was a really interesting example of social game play experience built around social dynamics [3].

[Ben] I agree – as a spectator you get to observe as people struggle with the game. Especially the first moment of panic, where a new player tries to think of what to do. The delicate encouragement of the person showing them the game (“try being more gentle”, “try a bit higher up”) I found to be the climax of the game.

The Designer Intent

[Ida] Like in Corinne’s book, the game is a celebration of feminine individuality, power and creativity. It’s a statement in a world where women's sexuality is being shamed and oppressed at the same time that women's body parts are photoshopped and modelled in odd and non-representative ways in a lot of our cultural media. The book shows a diversity of women's bodies - in a flat and non-prioritized structure, a diversity that is often censured from mainstream media.

[Sabine] Adapting a vulva shape for a game level is a quite efficient strategy to achieve that structure. Everyone playing games knows that different level territories look differently, so players will expect variety. At the same time, each vulva fills the whole screen, so players are invited to explore details. This kind of representation toys around with a long established tradition of genital drawing in games.

[Ida] Whenever there is a game that allows you to draw, the first thing that goes online is drawings of penises. Where is the mainstream pop-cultural equivalent - the casual vagina humour, I wonder? We’re not talking simply about putting vaginas on display, but daring to enjoy them, celebrate them through the popular media available to us. Well, *Cunt Touch This* has exactly this to offer.

[Sabine] We had a lot of fun coming up with a silly kind of vagina humour that is linking back to Corinne’s legacy. I admire the way she articulated the innocent activity of drawing to female sexuality, delivering a strong message: humour and pleasure go hand in hand, and sky is the limit to your imagination of how you wanna own that pleasure.

Discussion

[Ben] So the game isn't intended to be embarrassing?

[Andrea] It was not our intention to embarrass, but I can see how that emotion could be evoked in some players. The book was first published with the name 'Cunt Coloring Book' and was instantly wildly popular, then some people complained about the 'awful' name, they made a new edition called 'Labiaflowers', and then the book virtually died - I find this detail interesting.

[Sabine] I think embarrassment happens when players haven't internalised the idea that vulvas are potentially something to "play around with". One of the most fascinating comments we have received about the game so far came from a male designer of "sexual health" games, who argued that the game was "offensive" because it didn't address female sexuality from a serious health perspective.

[Ben] Perhaps he was "Too Legit to Clit"? (sorry)

[Ida] Being embarrassed is only one out of many reactions that we got for the game. Apparently, there are many play styles one can enjoy. Some players have spent a long time in the game, carefully listening to the music and playing around with colour schemes, and pointing out the beauty of the level shapes.

[Ben] On reflection I agree on this point. As something of a penis aficionado [2], colleagues frequently tweet me photos of scrawled knobs. I'd roll my eyes at "Cock Touch This", but embarrassingly my first reaction to the female equivalent was a cold sweat. That's a problem.

[Sabine] In that way this game makes tangible how far we stand in the cunt question. Are you ready to enjoy cunt humour as you can enjoy dick humor? And if not, what does your cold sweat mean, gender politics wise?

[Ben] Apart from that, *Cunt Touch This* is quite special when played with a facilitator – it feels very intimate. We might view it as a game of sexual discovery? Like how "Spin the Bottle" and other kissing games provide "safe" spaces to explore sexuality? (e.g. [4])

[Sabine] Maybe a discovery of a pleasure angle on female sexuality, exploring what is usually left out of the picture.

[Andrea] And by showing many different looking vaginas in rapid succession we might also learn how to embrace them as normal.

[Ben] Ideally, should cunt colouring, both in app and book form, be an unremarkable/banal activity? Is the desired response to your game an apathetic shrug, rather than the embarrassment I found in it?

[Sabine] Well, different social bubbles come with different tastes and pleasures. I really like the bubble in which playing *Cunt Touch This* is neither embarrassing nor shrugged off. It's simply enjoyed as a social activity of artistic digital cunt colouring in good cumpany (sorry). That's why we handed you the tablet in the first place.

Acknowledgements

Thanks to the AHRC Performance in Games Network, Patrick Dickinson and the University of Nottingham, for starting this conversation.

References

[1] Corinne, T. (1975) Cunt Coloring Book. Pearlchild.

[2] Kirman, B., Lineham, C., & Lawson, S. (2012). Exploring mischief and mayhem in social computing or: how we learned to stop worrying and love the trolls. In CHI'12 Ext. Abs. (pp. 121-130). ACM.

[3] Linehan, C., Bull, N., & Kirman, B. (2013) BOLLOCKS!! Designing pervasive games that play with the social rules of built environments. Proc Advances Computer Entertainment (ACE). Springer.

[4] Sutton-Smith, B. (1959). The kissing games of adolescents in Ohio. Midwest Folklore, 189-211.

Author Biography

The authors are a collection of game designers, artists and scholars who share an interest in the potential of games to create uniquely personal and experimental experiences, including uncomfortable and/or embarrassing social experiences. In addition the authors appear to share a love for crude wordplay and MC Hammer.

Awkward Shopping: The Embarrassing & Embarrassed Ethnographer

Wei Eng Koh
NCR
9 Tampines Grande
Singapore 528735
WeiEng.Koh@NCR.com

Jocelyn Sie
NCR
9 Tampines Grande
Singapore 528735
Jocelyn.Sie@NCR.com

Graham Johnson
NCR
Discovery Centre, 3 Fulton Road
Dundee DD2 4SW, Scotland
Graham.Johnson@NCR.com

Andrea Szymkowiak
Abertay University
Bell Street
Dundee DD1 1HG, Scotland
a.szymkowiak@abertay.ac.uk

License: The author(s) retain copyright, but ACM receives an exclusive publication license.

Abstract
How often do you open up about your embarrassing moments to others, even entertaining their prying? We recognise that embarrassment is a social construct that most people wish to hide and is rarely discussed openly. Using an ethnographic approach, we explored the value and challenges of studying consumers' embarrassing experiences in retail contexts. In particular, reflecting upon our experience as ethnographers with that of the respondents during the study, and the implications for future research.

Author Keywords
Embarrassment; ethnography; methodology

ACM Classification Keywords
H.5.2. [Information interfaces and presentation (e.g., HCI)]: User Interfaces – Evaluation/methodology, theory and methods, user-centered design.

Why are people embarrassed?
Embarrassment is associated with negative emotions about the self as a result of self-reflection and evaluation, brought forth by a deviation from socialised standards, pronouncing the social (un)acceptability of said behaviour [9]. Individuals mediate embarrassments differently, in that those with a higher concern for observable behaviour, conformity and the desire to please others are more susceptible to embarrassment than those with lower concerns [5].

Exploratory observation

We employed an exploratory observation (design ethnography) of consumers in an actual shopping context (shop-alongs), and interviews to reveal more comprehensive accounts of the embarrassing nature of some forms of shopping.

Respondents: A UK study took place in Dundee. Seven British females, aged 21-27, took part in the interviews and allowed us to observe their shopping trips. A complementary study ensued in Singapore, where six Asian females, aged 26-37, participated.

Method: Preliminary observations, respondent interviews and shop-alongs were conducted in specialty stores (e.g. adult shops, lingerie boutiques, see Figures 1), drugstores, convenience stores, supermarkets, and department stores at different times of the day, in different locations.

Embarrassment in the retail context is often accrued by purchase of products or services that are 1) "unpalatable to society at large but are, nevertheless, tolerated – indeed often highly sought after – by a limited number of customers[10]" and 2) "…by all standards acceptable to society but that the buyer is reluctant to acknowledge or discuss[10]". Presence of others contributes significantly too; whether a social presence is physically present or merely imagined in the purchasing context [4].

Challenges of studying embarrassment

There has been limited exploration of consumers and embarrassment in service encounters, and the impact on the other actors in the servicescape[6]. Studies around embarrassment are typically product-focused, such as those associated with condoms, personal hygiene or beauty products [4,1,2].

Our study of shoppers' embarrassment was motivated by an interest in the use of self-service technology from the consumers' perspectives. We employed an ethnographic approach where we observed shoppers in their naturalistic environment—retail spaces—and conducted in-depth interviews with respondents to probe further on the triggers and effects of embarrassment felt while shopping. Besides the environment helping respondents bring their stories to life, conducting interviews in these retail spaces help evoke memories of embarrassing retail incidents.

According to Brewer [3], ethnography is "not a particular method of data collection but a style of research that is distinguished by its objectives, which are to understand the social meanings and activities of people in a given 'field' or setting, and an approach, which involves close association with, and often participation in, this setting".

It is understandably difficult to find respondents willing to share their embarrassing shopping experiences with someone they are not familiar with. More so given the degree of scrutiny and probing required for the study. Pragmatic decisions had to be made in the research design, including focusing on a single gender; female ethnographers and female respondents.

Considering how Chinese Asian cultures are presumed to be more 'interdependent' than the 'independent' Western cultures and where avoiding shame is of particular importance [7], these consumers are expected to internalise or suppress feelings of embarrassment. Also informed from the study conducted in Dundee which involved cold-calling for respondents, we decided to capitalise on existing relationships instead to reduce the anxiety and lower the barrier of discussing their embarrassment for respondents; friends were recruited as respondents. Such recruitment also shortens the time previously needed to build rapport/trust with the respondents.

Effects of multiple roles of the ethnographer

One of the difficulties of an ethnographic approach is that of maintaining 'distance', i.e. adopting an impersonal and objective outlook. In this study, we caught ourselves involuntarily playing varying roles: a neutral observer, the catalyst of respondents' embarrassment and the friend sharing the embarrassment. What is important, though, is to remain reflexive throughout the process, so we are aware of the position being taken and its implications on the data collected.

Figure 1. Adult shop; selling sex-related products

Figure 2. Shop-along; buying sanitary pads

We took care not to be part of the "perceived gaze" that was attributed as one trigger of embarrassment. In Singapore, where self-checkout kiosks (SCO) are relatively new, respondents shared their habit of studying others using SCO in order to learn how to use it and avoid usage hiccups. Hence while using SCO to make embarrassing purchases, respondents expressed unease knowing that others might be observing them as well.

Studies [8] suggest that witnessing an individual in embarrassing circumstances may also affect observers. Indeed, during the study, the ethnographer who accompanied one respondent, who was a teacher, to the sex shop noted personal embarrassment induced by the situation:

"Orchard Road was already quite crowded by the time we reached the entrance of 'Naughty'… It felt awkward that right opposite the shop entrance there were a few smokers smoking and chatting beside a bin. It wasn't easy to walk into the shop naturally."

Another consequential embarrassment that arose was empathic embarrassment, where the ethnographer puts herself in the shoes of the respondent and in turn mentalizing the respondent's emotions. This was noted by the ethnographer who accompanied one respondent on a condom purchase.

"While she was paying at the cashier, a man entered the store so she quickly kept the packet of condom in her bag before the cashier bagged it. Although I knew I wasn't the one getting the condom, I too panicked and found myself edging towards the exit."

Finally, we also felt the "impulse to help" the respondents, i.e. empathic concern; an instinctive response due to empathy for a person in need and an increased tendency to assist [11]. In such instances the ethnographer had to assume a neutral position and observe how the respondent would cope with the situation unaided. Back to the first scenario, when the respondent was hesitant to enter the sex shop, instead of encouraging her as a friend, the ethnographer made a conscious effort not to influence but gave her space to process the situation herself. While interviewed, unlike the ethnographer, she was not as concerned about the men smoking near the store. Rather, as a teacher, she was more worried her students who frequent Orchard Road, a popular shopping district in Singapore, might walk past and spot her.

Implications for future research

Given the commercial yet sensitive nature of this study, leveraging on existing relationships was advantageous. But with it entails the added complexity of managing existing friendships between the ethnographer and respondent, where the former may face dilemma of how to deal with the additional sensitive private details about her friend's life, which would not have been revealed otherwise if not for the study.

That also brings about ethical concerns where the ethnographer might reserve certain information about her friend she deems overly sensitive and unnecessary for analysis, unaware that the study could have benefitted from such information.

Approaching our analysis autoethnograhically; being reflexive and generous with personal experiences on

the ethnographers' part, helped create more data points and enriched our findings.

The anecdotes taken from ethnographers' fieldnotes show that embarrassment is an emotional response that has important personal and social consequences, both for the subject of embarrassing circumstances and for the observers, regardless of how naturalistic the setting is.

Since we know that embarrassment can occur whether a social presence is physically present or imagined [4], further studies could also explore other means of observations, without the physical presence of the ethnographers, possibly using pre-mounted video cameras in the retail space. This would enable the understanding of the effect of cameras or CCTVs on shoppers' embarrassment, as well as the behavioural impact of ethnographer's absence on respondents.

Acknowledgements

We thank all the respondents who shared their shopping experiences with us and special thanks to Li-Chuan Chiang and to Paola Loubli who were essential to the fieldwork.

References

[1] Bell, J. Why embarrassment inhibits the acquisition and use of condoms: a qualitative approach to understanding risky sexual behaviour. *Journal of Adolescence 32*, 2 (2009), 379-391.

[2] Brackett, K.P. College students' condom purchase strategies. *The Social Science Journal 41*, 3 (2004), 459-464.

[3] Brewer, J.D. Ethnography. Buckingham: Open University Press (2000), 59.

[4] Dahl, D.W., Manchanda, R.V., and Argo, J.J. Embarrassment in consumer purchase: The roles of social presence and purchase familiarity. *Journal of Consumer Research 28*, 3 (2001), 473-481.

[5] Edelmann, R.J. Individual differences in embarrassment: Self-consciousness, self-monitoring and embarrassibility. *Personality and Individual Differences 6*, 2 (1985), 223-230.

[6] Grace, D. An examination of consumer embarrassment and repatronage intentions in the context of emotional service encounters. *Journal of Retailing and Consumer Services 16*, 1 (2009), 1-9.7

[7] Ho, D.Y.F., Fu, W., and Ng, S.M. Guilt, shame and embarrassment: Revelations of face and self. *Culture & Psychology 10*, 1 (2004), 64-84.

[8] Stocks, E. L., Lishner, D. A., Waits, B. L. and Downum, E. M. I'm Embarrassed for You: The Effect of Valuing and Perspective Taking on Empathic Embarrassment and Empathic Concern. *Journal of Applied Social Psychology, 41* (2011), 1–26.

[9] Tangney, J.P. Self-relevant emotions. In M.R. Leary, and J.P. Tangney (Eds.), *Handbook of Self and Identity*. New York: Guilford Press (2003), 384-400.

[10] Wilson, A., and West, C. The marketing of unmentionables. *Harvard Business Review 59*, 1 (1981), 91-102.

[11] Batson, C.D. (1991). The altruism question: Toward a social-psychological answer. Hillsdale: Erlbaum Associates.

Embarrassing to Collaborate?

Figure 1. Revellers struggle with a grid of cable-tied hula-hoops released on them at the climax of a Domino Records Showcase

Robb Mitchell
University of Southern Denmark
Kolding 6000 DK
robb@mci.sdu.dk

.

Abstract
This position paper briefly outlines my interest in embarrassment– principally in relation to experiments provoking collaborative encounters in contexts that range from urban spaces to art galleries, and from music events to industrial innovation workshops.

Figure 2. A gallery goer enjoys manipulating the room filling horizontal revolving door-like *Heads up of The Table* physical social contraption.

Introduction
In my experience, design experimentation that stretches the normal boundaries of social acceptability can actually lead to increasing, rather than diminishing

Figure 3 In situ view of *Heads Up of The Table* showing the two human sized cutaways on opposite sides of the revolve-able surface.

Figure 4. Two table users synchronise their rotations (external view)

the conviviality of a setting. Disturbing of expected behaviours may spark novel interpersonal exchanges, expressive play and lead to new ideas for people effected, whilst also offering a means for designers and researchers to better understand social situations.

Designing for collaboration and conversation

My work is interaction design in the broader sense of the term. I do not view cutting edge technology as a prerequisite for exploring social issues in HCI. As the social media theorist Clay Shirky puts it:

"Communications tools don't get socially interesting until they get technologically boring" [9].

Working across a variety of domains such as interactive arts, participatory design and event curating (figure 1), I have devised artifacts, environments, processes, systems and events which aim to help bring people closer together - creatively, socially and professionally. In particular, addressing the barriers between: remote locations; different disciplines; experts and non-experts; and other co-located people who are not yet acquainted with each other.

Embarrassment as an interpersonal shield

The notion of barriers calls to mind the etymology of the word embarassment i.e. its origins in meaning *obstruction*. Although never an implicit aim, the powerful phenomenon of embarrassment has played a major role in many previous projects. Several themes concerning different connections between senses of embarrassment, obstruction and fostering positive co-located encounters are briefly discussed in the following.

Amplify awkwardness until it disappears

Embarrassment is relational – to be embarrassed normally involves a sense of negative imbalance of emotions such as dishonor or shame compared with other people. Having a witness to getting stuck in a typical revolving door would thus be an embarrassing experience for many people. However with a turnstile like social contraptions such as *Blender*, and *Heads Up of The Table* (Figures 2-7) all participants found the artifact challenging to their movements. If disconcertment is universal within a context, then the potential for embarrassment is much reduced.

Both these contraptions are part of series of art installations that were designed to foster positive face-to-face interactions between strangers who may not otherwise interact [4]. Each contraption presented participants with a shared physical obstacle. This was intended to create a situation in which there are less predetermined "rules" concerning how to behave. Providing a novel constraint on "normal" behaviour was intended as a route to partially dissolve the everyday norms (both internal/individual and social/collective) that may inhibit social interactions between the unacquainted. This in turn, could provoke and encourage a fluidity of interaction between strangers.

Surfacing social design challenges

Physical social contraptions as well as related deployments of human avatars [7] may also offer insights relevant for understanding embarrassing interactions. These low-tech interventions can open up for discussion issues such as adaptation, control, visibly, accountability, sharing and differences in participant roles. Paradoxically, in comparison with digital social systems, the contraptions seem to move

Figure 5. Two groups of visitors negotiate the direction of travel of *Blender*'s panels

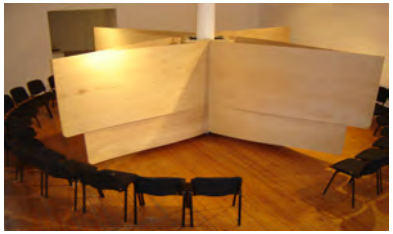

Figure 6. *Blender* divided a room into four sectors that circulated upon participants pushing and pulling the giant turnstile

Figure 7. The briefness of encounters between circulating and seated participants lead to "peek a boo" like exchanges.

both towards making people's responses into a "material" that is visible and tangible. However, at the same time, in provoking a wide variety of unpredictable responses the contraptions make vivid how this is a tangibility that eludes a firm grip and is thus a visibility that both illuminates and obscures [5] [7].

Breaching embarrassment to & from public collaboration

While physical constraints have long been exploited as a design tactic or inspiration in the overall quest for a more human-centered design and development process, another intuitive quality of interaction has been somewhat overlooked, namely that of social constraints and the instinctive social behavior of people [8].

Ordinary social order impedes attempts by technologists to provoke disparate individuals to collaborate or share experiences in urban public spaces. To address these barriers we analysed responses to a number of city center social interventions inspired by the sociological concept of breaching experiments.

In these cases, embarrassment was prominent in three ways. Firstly, and not surprisingly, it was detectable in the responses of passers by to the performed "breaches". Secondly, many of the students that devised and implemented these interventions reported great initial embarrassment before the public implementation of their experiments. And thirdly, the sense of embarrassment was profound when we as researchers sat down to watch video recordings of several of the interventions. For instance, watching documentation of students sit down at the café tables of strangers and making small talk prior to performing their "breach" of asking if they can taste the food on the strangers' plate [8] was particularly excruciating at times.

Dishonour users with expressive mundanity

I am proud to have been involved in supporting some recent student work with mechatronical furniture that also provokes and reveals issues of embarrassment. For instance a toilet brush that attempts to build a relationship with people sitting on the lavatory [1] and tables that respond to different speeds at which companions eat [8] or the speed at which people approach it [2]. Designs such as these offer potential both as research vehicles into social contexts and as a means of harnessing embarrassment towards motivating behaviour change [2].

Clumsy mishaps breed insightful excuses

Based upon a survey of several years of innovation workshop activities focused upon fostering shared understanding of business challenges, we developed an argument for the value of "Oops! Moments" [6]. By which we mean the surprise and uncertainty evoked by the use of 'kinetic materials' (e.g. bouncing balls, springs, and see-saw like mechanisms) in business strategy discussions may facilitate fresh and spontaneous exchanges of perspectives (figures 8 - 9).

To avoid potential embarrassment when being seen as unable to manipulate physical objects according to their intentions and expectations, workshop participants improvise creative and humourous explanations that often inadvertently serve to enliven and enrich shared sensemaking concerning innovation challenges [6].

Figure 8. Losing control of an unpredictable spring provokes a humourous insight during a "tangible business model" workshop with industrialists

Figure 9. Marbles bouncing unpredictably down a pinball-like ramp, provoke discussions of if-then causalities in business strategy

Figure 10. Two blindfolded hunters are unaware of being teased by their quarry in social bodily play game "Reindeers and The Wolves".

Sensory deprivation prompts embarrassment

Blocking a perceptual channel of one kind of participant can contribute to increasing both bodily expressivity and vocalizations that might be considered prohibitively undignified under other circumstances.

Reindeer and The Wolves is a digital movement based game that features two blindfold participants in physical pursuit of three other players. Obstructing the perceptual channel of sight appeared to release players to perform expressive bodily actions and vocalizations that might be considered prohibitively undignified under most other circumstances (figure 10) [3]. However we could discern little sign of embarrassment amongst participants and audience.

For a person's action to be considered embarrassing, it is commonly understood that another person should either witness it, or come to know about it through some indirect means. This can help to explain how non-blindfold players felt free to act ignominiously towards their non-sighted competitors. However, it is interesting that blindfolded players themselves also performed very self-demeaning actions. It was as if the lack of two-way contact with witnesses to undignified actions serves to remove or reduce what would otherwise be their embarrassing qualities.

Acknowledgements

Thanks to all my co-authors, and members of SPIRE Centre for Participatory Innovation Research, SDU Design, IT Product Design, Sønderjyllands Kunstskole, and Simon Harlow and Ben Radcliffe and other members of The Chateau, Glasgow for their creative, intelligent and generous contributions.

References

[1] Boer, L., Hansen, N., Möller, R.L, Neto, A.I.C, Nielsen, A.H. and Mitchell, R. The Toilet Companion: A toilet brush that should be there for you and not for others. In *Proc. Augmented Human Conference*, ACM (2015).

[2] Boer, L. Mitchell, R., Caglio, A. and Lucero, A. Embodied Technology: Unravelling Bodily Interaction with Normative Types. In *CHI'15 Extended Abstracts,* ACM (2015).

[3] Finnegan, D., Velloso, E., Mitchell, R. Mueller, F.F., and Byrne, R. Reindeer & Wolves: Exploring Sensory Deprivation in Multiplayer Digital Bodily Play. In *Proc. CHI Play,* ACM (2014), 411-412.

[4] Heinemann, T. and Mitchell, R. Breaching barriers to collaboration in public spaces. In *Proc. TEI '14*, ACM (2014), 213-220.

[4] Mitchell, R. Physical contraptions as social interaction catalysts. *3rd International Workshop on Physicality*, (2009), 37-42.

[5] Mitchell, R. Caglio, A. and Buur, J. Oops! Moments: Kinetic Material in Participatory Workshops. In *Proc. NORDES - Nordic Design Research Conf.*, (2013), 60-69

[6] Mitchell, R., Gillespie, A. and O'Neill, B. Cyranic contraptions: using personality surrogates to explore ontologically and socially dynamic contexts. *Desire'11*, ACM (2011), 199-210

[7] Mitchell, R. Papadimitriou, A., You, Y. and Boer, L. Really Eating Together: A Kinetic Table To Synchronise Social Dining Experiences. In *Proc. Augmented Human Conference*, ACM (2015).

[8] Shirky, C. *Here Comes Everybody: The Power of Organizing Without Organizations*. Penguin Press (2008).

‘Siri Thinks I Have Two Wives’ & Other Embarrassing Voice Interactions

Nikhil Sharma
Google, Inc.
1600 Amphitheater Pkway.
Mountain View, CA 94043 USA
nikhilsh@google.com

Abstract
Voice use is gaining prominence. However, people feel awkward using voice user interactions (UIs) around others. This is because voice UIs can be particularly embarrassing. Based on two years of research on voice UIs, I suggest some reasons why voice UIs can be particularly embarrassing. I also list research questions that can help guide development of voice UIs. I hope the workshop will provide an interesting forum to discuss challenges as well as opportunities for reducing embarrassment while using voice UIs.

License: The author(s) retain copyright, but ACM receives an exclusive publication license.

Author Keywords
Voice; search; conversation; speech; assistant; actions.

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

Introduction
To organize the world’s information and make it universally accessible and useful, we need to employ multiple modes of interaction. There are many situations where speech is the most appropriate mode for making information accessible and useful. Recent advances in speech technologies like support for different languages and touch-free hot wording have led to an increased focus on voice as an important interaction mode.

However, there are many barriers to the adoption of voice UIs. One of them is that they have the potential to be embarrassing. In this paper I will talk about my background, some voice-focused projects that I have worked on that have examined barriers and challenges to voice UI adoption. My hope is to have some of these challenges considered in the workshop, especially those related to embarrassing interactions.

Background

My doctoral studies and my multiple HCI publications focused on how people search for and make sense of information. Since I have always been very interested in how HCI can help people get to the right information, working on Search was a great fit for me after my PhD. I am currently the research-lead for voice search at Google. Over the last two years or so I have worked on establishing a research vision for voice use in search. This research vision is needed to support large-scale voice efforts that are currently underway. I have conducted more than 30 studies on voice interaction using a variety of methods from controlled experiments to surveys. While this position paper does not include detailed findings from those studies, I am looking forward to sharing and gleaning insights at the workshop.

Voice & Embarrassment

In Google, as well as industry in general, there is a renewed focus on voice. One initiative has been to make voice interaction available across devices. This includes making devices that interact primarily through voice (e.g. Google Glass, Android Wear watches, in-car systems), making voice central in devices that currently utilize voice (e.g. smartphones, tablets) and introducing voice to devices where voice use was not present before (e.g. desktops). Another initiative has been to provide assistance to the using voice wherever possible: for search [how tall is the Eiffel Tower] as well as actions [Call mom on her mobile phone].

Along with great possibilities for interactions, voice also brings potential for embarrassing interactions.

Figure 1. Siri thinks I have two wives. Source: Sean Herber [1].

Imagine the situation in Figure 1 happening when the user is with other friends. The situation can be comedic or disastrous depending on whether the “wife” is present.

Siri is by no means the only voice UI that creates embarrassing situations. In my studies, when I have asked users what some of the barriers to using voice UI are, ‘being socially awkward’ is one of the most frequently mentioned.

This makes one wonder, what makes voice interactions socially awkward and embarrassing. I have postulated three reasons why this might be the case:

First, while voice recognition is improving it is imperfect; voice interactions also involve significant artificial intelligence that is not trivial. Thus the possibilities for errors are common.

Second, voice interactions have a greater potential to be overheard. The progression from time-share computers to personal computers to smartphones and tablets has made computing devices very personal. People can use touch UI to interact with their devices and the smaller screens of smartphone offer more privacy. Voice UIs run counter to this trend.

Thirdly, voice as an interaction method co-evolved with our social interactions. This makes voice an inherently social human-to-human interaction medium [1]. This could be a reason why people feel awkward using voice UIs to interact with a device when other people are around.

Overcoming Embarrassment

All this raises interesting research questions about voice interactions and embarrassment:

Firstly, can voice interaction technology become sufficiently error free to avoid embarrassing situations? More importantly, since no UI is error free, how can voice UIs be designed that errors do not embarrassing our users?

Secondly, will users feel comfortable using voice UI in presence of others? On one hand voice interaction with a machine could be an inherently awkward situation, on the other hand people have adopted many technologies that once seemed socially awkward. Talking on a mobile phone and taking ‘selfies’ in public are some examples. If a critical mass of users start using voice UIs in public, will it become the norm to use voice UIs in public? Initial data suggests that teens may be more comfortable using voice than adults [2].

These questions do not compromise a comprehensive list. These and many other questions will keep a community of scholars busy for a long time. I am interested in hearing what other UIs have faced and overcome embarrassing interactions? What methods have been used to study them? What solutions have been tried and rejected? What has worked? More than that, I would like the opportunity to engage with scholars from both academia and industry who share the common belief that embarrassment should not be the cause for stopping, but for learning and forging ahead.

Reference

[1] Nass, Clifford Ivar, and Scott Brave. Wired for speech: How voice activates and advances the human-computer relationship. Cambridge: MIT press, 2005.

[2] Sean Herber. Great! Now Siri thinks I have two wives. Twitter post. https://twitter.com/bigzaphod/status/125694312305537024

Retrieved: Retrieved: January 19th, 2015

[3] OMG! Mobile voice survey reveals teens love to talk. Google Official Blog. http://googleblog.blogspot.com/2014/10/omg-mobile-voice-survey-reveals-teens.html

Retrieved: January 19th, 2015

Trust and Intimate Interaction in Nordic Larp

First Author
AuthorCo, Inc.
123 Author Ave.
Authortown, PA 54321 USA
author1@anotherco.com

Second Author
VP, Authoring
Authorship Holdings, Ltd.
Authors Square
Authorfordshire, UK AU1 2JD
author2@author.ac.uk

Abstract
Intimate play can be perceived as embarrassing or intrusive, it can violate personal boundaries, or make players feel unsafe. At the same time, intimate play can be fun, exhilarating, and trust-building. We look into intimate interactions in Nordic larp to get deeper insights into what triggers one reaction, or the other.

Paste the appropriate copyright/license statement here. ACM now supports three different publication options:

- ACM copyright: ACM holds the copyright on the work. This is the historical approach.
- License: The author(s) retain copyright, but ACM receives an exclusive publication license.
- Open Access: The author(s) wish to pay for the work to be open access. The additional fee must be paid to ACM.

This text field is large enough to hold the appropriate release statement assuming it is single-spaced in Verdana 7 point font. Please do not change the size of this text box.
Every submission will be assigned their own unique DOI string to be included here.

Author Keywords
trust; intimacy; embarrassment; play; live action role-play; Nordic larp

ACM Classification Keywords
J.5 Arts and humanities: Performing arts.

Introduction
Do you play *Twister*, *SingStar*, *strip poker*, or *Spin the Bottle*? Which ones would you play with your colleagues? With your sister? Why?

There are numerous games that encourage intimacy and physical closeness [6][13].Yet most people will set limits for how they wish to engage in games that require intimacy. Apart from being a source of embarrassment, intimate play can be perceived as intrusive, it can violate personal boundaries, or make players feel unsafe. At the same time, that mutual embarrassment and the trust it implies can be exhilarating. Trust is key here: do the players trust the game design, the event, and each other – and how can trust-building be facilitated.

In this text, we explore the relationship between intimate play and trust. Investigating the Nordic live action role-playing (larp) tradition [17], we explore if trust is necessary to develop intimate play, and to what extent intimate play builds trust.

Daring to Larp

Larps developed from tabletop role-playing games like *Dungeons & Dragons* (1974) when players decided to abandon sitting around a table and started to enact the events bodily is space. In Nordic larp [17] the settings vary from the magical to the mundane, but the foundation, inhabiting a character in a fictional world co-created with other players, remains the same.

Larping is highly out-of-the-ordinary; pretending and acting as if you are someone you are not makes you a freak. So how can people even agree on larping in the first place? A commonly cited prerequisite for play is the feeling (and possibly illusion) of safety [1]. Social safety, the idea that one is not judged wrongly by larping, is an important building block. It relies on three reassurances that manage anxiety.

You are not judged based on your character. Role-players agree to separate the player and the character; this is called the *role-play agreement* [14]. Although the separation is analytic and indeed false in many ways, the idea is that the actions a player makes in a fictional setting should not be allowed to reflect on the player outside of the larp [14]. If players cannot trust that their actions are not interpreted this way, they become limited to the agentive procedures of her everyday persona.

You are not doing this alone. In a larp the participants also pretend that everyone else is someone else. You do not play just your own character, but everyone's, and within the context of the larp, that not playing along would be more deviant than playing along. In larp this has been called *inter-immersion* [12], and there are numerous formulations for engrossment in doing things together [16]

You are not doing it wrong. The key is not being a freak alone. One person pretending to be a lizard king is laughable, but if everyone present in the situation is playing along, a temporary new social reality is established. In order for the larp to be coherent and intelligible, players need to know how to communicate and interpret communication. This is facilitated by rules, a coherent background fiction, and pre-game workshops.

Overcoming the initial barrier to take part in pretend play as an adult is not enough, just as being able to play *chess* does not mean one is willing to participate in *Twister*. Some larps require the players to play at violence, power hierarchies, and intimate relationships. Fostering a situation where such potentially very embarrassing activities can take place requires firmly established trust.

Background: Trust and Intimacy

While trust is a multifaceted concept, Tanis & Postmes suggest looking at what people do: at a basic level a trusting behaviour involves *relinquishing power over outcomes valuable to the self* [18]. The social play in larp requires extensive relinquishing of power, in particular concerning social judgement as discussed above. Tanis and Postmes [18] further argue that trust

depends on the belief that the other will reciprocate. A player that relinquishes power to other players will expect them to fulfil their part. Communication is considered the foundation of trust [5] but trust also influences how people communicate [11]. Hence, the first step towards establishing trust is to make people talk to each other.

To some level, trust is quite easily established. Messick and Kramer [8] argue that humans have fine-tuned mechanisms for rapidly and shallowly evaluating trustworthiness and placing trust. We primarily place trust in individuals we believe we know or that we can somehow identify, but in absence of trusting individuals, membership of group is used to place trust [8]. In Nordic larp this is reflected in the concept of *ensemble play*, meaning that each participant is part of the group that is responsible for the outcome.

The relationship between trust and intimacy has mostly been researched in the context of intimate relationships (such as marriages). In this context, interpersonal intimacy is a complex relational concept where trust is a necessary component [19] but that also includes an element of self-disclosure. In work on inter-group dialogue, Biren [4] turns the relationship around and considers intimacy at the level of being friends to be a necessary prerequisite for self-disclosure.

There seems to be a potential for a ladder phenomenon where trust could be established early through fairly shallow means to support the basic role-play agreement (that the acts are not those of the players but of their characters), and creating a potential for deeper interpersonal intimacy.

The idea of creating a ladder of trust has been used outside of larp; it was taken to the extreme in 'Marathon' group therapy during the sixties [2]. It deliberately relied on group pressure to make patients move from 'impression-making and manipulative behavior' towards more honest and spontaneous interactions. Open only to people who declared themselves 'willing to change', participants would meet for two days straight: no interruptions, no subgrouping, and minimal breaks. Experiments with nude therapy sessions have been reported [3]. Today, we would most likely look upon such therapy techniques as unethical.

Pre-larp: Workshopping Intimacy

In Nordic larp, players typically sign up individually and do not necessarily know their co-players in advance. Yet all larps best simulate communities such as a village, a firm, an extended family, a gang, or the crew of a spaceship. Hence, players need to get to know each other before the larp also for practical reasons: they need to know enough of each others' roles to be able to play a tight-knit community. Still, many players may meet physically for the first time when attending the larp event. This requires that a basic level of trust, in particular trusting that other players will respect the player/character division, must be established within the group prior to the larp.

Many larp organizers organize workshops before the larp. General trust-building activities are sometimes used[1], but this is not the norm. It is common to start with an icebreaker exercise, but otherwise workshops tend to focus on exercises that are directly relevant for

[1] http://www.wilderdom.com/games/TrustActivities.html

the larp to be played. Focus is placed on communicating the artistic goals and fictional context of the larp, introducing techniques for meta-level communication, and letting players develop their characters and relationships. The activities serve a secondary purpose of creating a level of trust between players.

As the protective boundary of playing a character is not in place during workshops, workshops present their own problems related to intimacy and trust. It is not unusual that a certain level of forced intimacy will occur during workshops. Concerning physical intimacy, larps that use symbolic techniques for intimacy and sex typically let players practice them beforehand. Such exercises have been reported by players as more uncomfortable than actually playing with the techniques. In the larp, intimate play only happens if both players have agreed to it, while the workshop format leaves little room for negotiating the exercise in advance. Another example is when pre-larp workshops involve sharing personal stories related to the larp setting. Some players have reported problems with this coupling between the larp setting and characters - that is fictional - and their personal selves.

Playing on Intimacy

All social play requires collaboration. There needs to be an underlying trust in the collaboration, of playing together by shared rules. However, certain kinds of intense, close relationships that may require physical proximity require much more than just a collaborative basis. There are at least four kinds of intimate relationships, which sometimes merge and interact, that can create problems with trust.

Anchor relations

The most basic intimate relationship is that players need other players to be at the same time their friends, and form an in-game community. 'Anchor relations' and 'core groups' are designed to fulfill this purpose. These are characters which whom your character shares some level of mutual understanding; it can for example be a sibling, a close friend, an in-game spouse, or a family. Players will confide in their anchor relation or core group, share experiences, and gossip. The trust required to play this type of relation is typically established through quite shallow means: the fact that you are placed in the same group and is given some time to talk before the larp is often enough.

Romantic Relationships

It is not uncommon for role-players to engage in fictive romantic relationships. In the context of computer games, Waern [20] on romantic engagement in single-player games and Pace et al [10] discusses intimate relationships in online role-play. Waern [20] argues that one of the main drivers for romantic engagement in digital role-playing is the illusion of safety and fictionality; the romance is 'not for real'.

In comparison, larp could be considered both less safe and fictional than the romantic engagement in on-line multiplayer games, as live role-play is physically enacted and thus romance will require a certain level of physical intimacy. In larp, the role-play agreement functions to install an alternative alibi for romantic interactions. The alibi is strong enough to make romantic play fairly common in larp, facilitating what Poremba calls *brink play* [13]; one reason why people want to play romantic relationships in larps is that they do feel real, while everyone pretends they are not.

Indeed, the strategies that players develop for romantic play indicate that the player-character separation only presents an illusion of safety. Few players are prepared to play romantic story-arcs with just any other player, both for reasons of trust and attraction. Many players report on strategies to deal with lingering emotions post-game, as well as difficulties with negotiating the type of relationship the players would have after the larp. While the concept of bleed [9] covers several types of emotional interaction between the players' emotions and those expressed by the character, it is by far most common to talk about romantic bleed.

Sweet Nemesis
Relationships need not be of positive affect to be intimate. In larps, which draw from the more general dramatic traditions, the relationship between a hero and a villain, or of mischievous or bitter rivals can be quite intimate, sometimes as intoxicating as a romantic relationship. Playing such a relationship requires trust that the other participant respects ones boundaries – especially as such rivalries are usually carried out in public, whereas romantic entanglements are more prone to be conducted in the safety of relative privacy.

Antagonistic relationships are even heavier when there is a power imbalance in place. Playing a slave and a master, a prisoner and a jailor, a detainee and an interrogator, victim and rapist, requires relinquishing power in a very concrete way. Many players report difficulties in particular with playing the character with *more* power in such relations; and this has lead to an increased use of metacommunication that both players are comfortable with the current play, such as the word 'green' that can be uttered as a question (are you OK with this scene)?

Physical intimacy
Playing on physical intimacy and sex is less common, both in the sense that fewer larps include any way to represent physical intimacy and that in most that do, players still tend not to play extensively on sex.

In recent online discussions, it has become blatantly clear that the trust required to separate the character's actions from those of the player is not always in place when it comes to intimate scenes. Many players - especially young women - have difficulties trusting that a scene is initiated to create play or drama; the distrust also lingers after the game. Interestingly enough it does not seem to be the most sexually explicit larps that have the largest problems, but rather casual larp.

The design of how intimate play is represented in larp seems to be an even more important factor than trust between players. Stenros [16] catalogues a range of approaches for representing sex in larp, ranging from verbal communication to various expressive and symbolic simulation methods. The chosen methods reflect the kind of play that is encouraged, ranging from seeing it as a plot-enabling device to encouraging deeper relationship play.

Conclusions
Larping, and especially larping intimacy, requires trust. The foundation of that trust rest on the flimsy basis of the role-play agreement. Trust needs to be built amongst the players before play commences, and is constructed from pre-game communication, workshopping activities, and shared rules. The mutual doing-together of larp, the inter-immersion, ensures that it is more embarrassing to not play than to play while the larp is ongoing.

However, players do not always trust in this agreement. Furthermore, while the role-play agreement sometimes is sufficient in-game, trust issues may still emerge both before and after the actual play event. This is particularly obvious when the played relationships go beyond anchor relations. Romantic, sexual, and antagonistic relationships are intimate and possibly more embarrassing, and require a higher level of trust. While these kinds of relationships are habitually played in Nordic larp, there is no uniform pattern of negotiation or workshop tool box and players have their own informal methods of navigating for example potentially problematic players. As an art form, Nordic larp aspires to navigate a minefield but it does not manage to avoid all the mines.

References

[1] Apter M. J. *The Dangerous Edge: The Psychology of Excitement*. New York: Free Press, 1992.

[2] Bach G. R. "The marathon group: intensive practice of intimate interaction." *Psychological Reports* 18.3 (1966): 995-1002.

[3] Bindrim P. ”A report on a nude Marathon: The effect of physical nudity upon the practice of interaction in the marathon group.” (1968) *Psychotherapy: Theory, Research & Practice*, Vol 5(3), 180-188.

[4] Biren A. N. ”Breaking barriers, crossing borders, building bridges: Communication processes in intergroup dialogues.” *Journal of Social Issues*, 62,3 (2006) 553-576

[5] Deutsch M. "Trust and Suspicion." *Journal of conflict resolution* (1958): 265-279.

[6] Grace L. ”Big Huggin‘: Affection gaming for alternative play.” Exhibit, FDG 2014.

[7] Marková I. & Gillespie A. (eds) *Trust and distrust: Sociocultural perspectives*. IAP, 2008.

[8] Messick D. & Kramer R. ”Trust as a form of shallow morality.” In Cook (ed) *Trust in Society*. New York: Russell Sage Foundation, 2001. 89-117.

[9] Montola M. The painful art of extreme role-playing. *Journal of Gaming and Virtual Worlds*, 3(3), 2011.

[10] Pace T. Bardzell S. & Bardzell J. "The rogue in the lovely black dress: intimacy in world of warcraft." *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, 2010.

[11] Pearce W. B. ”Trust in interpersonal communication.” *Speech Monographs*, 41(3), 1974.

[12] Pohjola M. ”Autonomous Identities.” In Montola M. & Stenros J. (eds.) *Beyond Role and Play*. Helsinki: Ropecon, 2004.

[13] Poremba C. ”Critical potential on the brink of the magic circle.” *Proceedings of DiGRA 2007*.

[14] Sihvonen T. ”Pieni johdatus live-roolipelaamisen psykologiaan.” *Larppaajan käsikirja*. Tampere: SuoLi ry, 1997.

[15] Stenros, J. ”Amorous Bodies in Play.” In Grenzfurthner, J., Friesinger, G. & Fabry, D. (eds.) *Screw the System*. San Francisco: Re/Search.

[16] Stenros, J. *Playfulness, Play, and Games: A Constructionist Ludology Approach*. Doctoral Dissertation, University of Tampere. Forthcoming.

[17] Stenros, J. & Montola, M. *Nordic larp*. Stockolm: Fëa Livia. 2010

[18] Tanis M. & Postmes T. (2005). "A social identity approach to trust: Interpersonal perception, group membership and trusting behaviour". *European Journal of Social Psychology* 35: 413–424.

[19] Timmerman G. M. ”A concept analysis of intimacy.” *Issues in Mental Health Nursing* 12(1), 1991.

[20] Waern, A. "‘I’m in love with someone that doesn’t exist!: Bleed in the context of a computer game." *Journal of Gaming & Virtual Worlds* 3(3), 2011.

Submission for the Embarrassing Interactions Workshop: Playing with Embarrassment

Gavin Wood
Culture Lab,
School of Computing Science,
Newcastle University, UK
g.wood2@newcastle.ac.uk

Madeline Balaam
Culture Lab,
School of Computing Science,
Newcastle University, UK
madeline.balaam@newcastle.ac.uk

Abstract
We are interested in embarrassing interactions as part of wider research that explores digital games in our public spaces through a lens of play. Embarrassing interactions are an important feature of play and an inevitable facet of pervasive games. In this abstract we discuss several inspirational designs where a wide range of play includes opportunity to explore, manage and leverage embarrassment. We describe our method for creating more "playful" games and discuss the type of interactions we expect to experience and capture. We then describe how these interactions are embodied in our design exemplar i-dentity and introduce our latest work and our early results.

Author Keywords
play,playful design,game design,ludic enagagement

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

Introduction
Embarrassing interactions can be an enjoyable and humorous consequence of playing co-located games with other people, for example, in our game intangle

Figure 1. i-dentity: a digital game based upon childhood play.

(with Exertion Labs [5]) players follow suggestive computer-generated vocal instructions. These instructions ask players to touch one another's controllers while weaving their bodies together in awkward entanglements. However, embarrassing interactions remain relatively under-explored in the HCI community and in game studies.

Benford [1] is one author that has touched upon embarrassing interactions while exploring pervasive games in real world spaces. Benford suggests that social embarrassment should be managed as part of mitigating the risks in pervasive games in the real world. The PLEX framework [8], was created to help interaction designers understand how playfulness could help create designs that promote meaningful and memorable experiences for users. It expands a previous framework of pleasurable experience by considering characteristics of play from video games. The PLEX framework was designed around positive experiences of play. However, its few negative characteristics such as subversion, suffering and cruelty leave space for embarrassment. Lucero [8] reveals how they considered other categories - even suggesting shame as an additional resource for design.

Games have often regarded embarrassing interactions something that is to be avoided [7]. However, where games have explored embarrassment (such as in Music Embrace [12]) we find compelling play. In the body space games defined by Segura [10] embarrassment is encountered as a result of play that involves the users' body movements. Players enjoying Segura's BodyBug have found that playing with this device can be an excuse to perform embarrassing movements, allowing children to dance badly and explore new movements that they might otherwise have avoided [10].

The authors of these games share a common goal by aiming to allow "flexible and adaptable rules" [11]. This goal can also be described as striving to create technologically supported games [9] – where our games need not have a complete game engine, rather the game engine is completed with the rules brought by the player. We believe that it is this flexibility and its associated ambiguity that gives the players opportunity to be self-expressive, imaginative and free-moving, providing the potential for embarrassment.

Methodology

As part of wider design led research into digital games in our public spaces we are using a lens of play [15] to develop new theories and find insights. This lens of play is helping unpick games by looking at the characteristics of play (such as those described [13]) and by considering the difference between gamefulness and playfulness. This distinction was first introduced by Caillois who placed play on a continuum between ludus and paidia [2]. Ludus (or gamefulness) consists of formal play which is bounded by rules and has defined winners and losers. In contrast, Paidia (or playfulness) and our focus for design, is typified by activities that involve improvisation, expressiveness, spontaneity, and uncontrolled fantasy (described [8]). Using this lens we are buildings new games for our public spaces that help connect the physical world with the digital world. As such, we are interested in embarrassing interactions since we should 1) manage there occurrence to mitigate risks, 2) use them as a design resource to inspire novel interactions.

Figure 2. intangle: A game about taking liberties.

Figure 3. The Wild Man game with an artist's impression of one digital experience.

i-dentity – a platform for exploring body space play

The body space game i-dentity (see Figure 1) [6] was created in the Games Jam at CHI 2013 in collaboration with Exertion Labs. The authors of i-dentity were inspired to merge digital and traditional play by the new games movement [3] and Head Up Games [11].To play i-dentity you have to spot the odd-one-out based on watching the real world movement of several players. These players are acting together and copying the movement of a secretly nominated player amongst themselves who is attempting to hide by moving with the group. The player observing the game (the interrogator) can only find the odd-one-out by asking the players to attempt actions as a group, for example, they might ask the group to "hop on one leg". Every time the hidden play moves, all the group's controllers light up based on that movement, thus helping to conceal the hidden player's identity. Embarrassment is an interesting aspect of the game's gameplay. However, in keeping with the flexible nature of supported technology games, the interrogator can tailor the amount of potential embarrassment they place on the recipients by either calling out outlandish suggestions, or alternatively by keeping the actions tame. Similarly, the players are able to bend rules; we have seen players refusing to act out sillier suggestions.

The core software behind i-dentity has also been used for a further game intangle [5] (see Figure 2). intangle was designed to explore agency in computer games - we suggested that designers can facilitate varying levels of body contact through the design of shared controller interactions to introduce new types of gameplay. In contrast to i-dentity, intangle causes embarrassment from the outset as players are instructed to perform tasks such as "reaching under each other's legs", and "linking pinkies". We hypothesized during its creation that players would choose to exercise their agency, while conversely taking the agency away from other players. Similarly, the amount of embarrassment encountered by players could be unevenly spread.

As in Segura's body space games we find that embarrassing interactions are an embodied consequence of the play in both of these games. We hypothesize that this platform can identify the causes, conditions, processes and forms of embarrassment in our games, and how embarrassment impedes adoption of and engagement with interactive systems. This platform is highly suitable because we designed around the Sony PS3 Move Controllers and PS Move API (thp.io) source code. The controllers were created to be playful, aesthetic and tangible, as illustrated in the game J.S. Joust by Wilson [14].

Work in progress

A deeper understanding of embarrassing interactions is particularly important for games that are played in our public spaces since they are not only experienced between players, but also by spectators. In our current work we place particular emphasis on play that challenges our expectation of what behaviour is appropriate in our public spaces. In our Wild Man Game we have developed a mobile phone experience (pictured Figure 3) that lets visitors experience a heritage site from the perspective of a "wild man". The

The Wild Man game asks players to involve themselves in wild and sometimes embarrassing play, for example,

creeping around, dancing expressively or even mimicking the call of wild animals. In our early results, we find that our game provides an interesting hook to the site and a convenient alibi for behavior that challenges the social norms of these spaces.

Acknowledgements

This submission was funded by the AHRC Creative Exchange Knowledge Exchange Hub.

We would also like to thank Jayden Garner and colleagues at Exertion Games Lab, RMIT, for inviting us to collaborate on both i-dentity and intangle.

Bio

After completing an undergraduate degree in Software Development, Gavin worked in the games industry for 12 years as a designer and lead programmer. Gavin now publishes to the indie label BaaWolf. Gavin is undertaking his PhD final year researching how playful pervasive games can change our relationship with public spaces.

References

[1] Benford, S., Greenhalgh, C., Giannachi, G., Walker, B., Marshall, J., & Rodden, T. (2012). Uncomfortable interactions. Proc. *CHI'12*, 2005.

[2] Caillois, R., Man, Play and Games. University of Illinois Press, Urbana, Aug. 2001.

[3] Fluegelman, A., and Tembeck, S. The New Games Book. Play Hard, Play Fair, Nobody Hurt. A Headlands Press Book, Dolphin/Doubleday, 1976.

[4] Goddard, W., Byrne, R., and Mueller, F.F. Playful Game Jams : Guidelines for Designed Outcomes. (2014).

[5] Garner, J., Wood, G., Danilovic, S., Hammer, J., and Mueller, F.F. intangle : Exploring Interpersonal Bodily Interactions through Sharing Controllers. 413–414, *CHI PLAY EA '14.*

[6] Garner, J., Wood, G., Pijnappel, S., Murer, M., and Mueller, F.F. i - dentity : Innominate Movement Representation as Engaging Game Element. (2014), 2181–2190.

[7] Huggard, A., Mel, A. De, Garner, J., Toprak, C.C., Chatham, A., and Mueller, F.F. Musical Embrace : Exploring Social Awkwardness in Digital Games. (2013), 725–728.

[8] Lucero, S., Karapanos, E., Arrasvuori, J., Korhonen. , H., Playful or Gameful? Creating delightful user experiences. *Interactions*, ACM (2014), 34-39.

[9] Montola, M., Stenros, J. and Waern, A. 2009, *Pervasive Games: Theory and Design*. Morgan Kaufmann Publishers Inc. Elsevier.

[10] Segura, E.M., Waern, A., Moen, J., and Johansson, C. The Design Space of Body Games : Technological , Physical , and Social Design. (2013), 3365–3374.

[11] Soute, I., Markopoulos, P., and Magielse, R. Head Up Games: combining the best of both worlds by merging traditional and digital play. *Personal and Ubiquitous Computing 14*, 5 (2009), 435–444.

[12] Mueller, F., Stellmach, S., Greenberg, S., et al. Proxemics Play: Understanding Proxemics for Designing Digital Play Experiences. Proc. DIS '14, ACM (2014), 533–542.

[13] Verenikina, I. and Harris, P. Child' s Play : Computer Games , Theories of Play and Children ' s Development. (2003), 99–106.

[14] Wilson, D. (2012). Designing for the Pleasures of Disputation -or- How to make friends by trying to kick them! PhD Dissertation, IT University of Copenhagen.

[15] Wood, G. Using play as a lens to bridge the physical with the digital. *CHI PLAY EA '14*, ACM(2014).