

# Designing Human-God Interfaces

Fabian Hemmert  
hemmert@uni-wuppertal.de  
University of Wuppertal

Andreas Bell  
bell@bildungswerk-bonn.de  
Katholisches Bildungswerk Bonn

Miriam Glöß  
1612072@uni-wuppertal.de  
University of Wuppertal

Maximilian Klaiß  
1623568@uni-wuppertal.de  
University of Wuppertal

Katharina Kurm  
1623450@uni-wuppertal.de  
University of Wuppertal

Ina van der Linde  
1647111@uni-wuppertal.de  
University of Wuppertal

Kathrin Neumann  
1631274@uni-wuppertal.de  
University of Wuppertal

Gürkan Orak  
1636360@uni-wuppertal.de  
University of Wuppertal

Katlin Sommer  
1639432@uni-wuppertal.de  
University of Wuppertal

Thanh Ta Dui  
1630179@uni-wuppertal.de  
University of Wuppertal

Paulina Wagner  
1646731@uni-wuppertal.de  
University of Wuppertal

Becky Weier  
1623100@uni-wuppertal.de  
University of Wuppertal

Michael Zalesak  
1666378@uni-wuppertal.de  
University of Wuppertal

## ABSTRACT

In this paper, we report the results from the ‘Human-God Interfaces’ project, which aimed to redesign traditional Catholic rituals, based on the principles of Tangible Interaction. Seven prototypes are presented. We discuss our learnings from the design process, highlighting how all prototypes follow the same recipe of incorporating a Catholic belief into a well-known everyday object and adding an ‘unknowable’ element.

## CCS CONCEPTS

• **Human-centered computing** → **Interaction design**.

## KEYWORDS

religion; catholic god; tangible interaction; rituals; design

## ACM Reference Format:

Fabian Hemmert, Andreas Bell, Miriam Glöß, Maximilian Klaiß, Katharina Kurm, Ina van der Linde, Kathrin Neumann, Gürkan Orak, Katlin Sommer, Thanh Ta Dui, Paulina Wagner, Becky Weier, and Michael Zalesak. 2020. Designing Human-God Interfaces. In *Mensch und Computer 2020 (MuC’20)*, September 6–9, 2020, Magdeburg, Germany. ACM, New York, NY, USA, 5 pages. <https://doi.org/10.1145/3404983.3409997>

Permission to make digital or hard copies of all or part 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 components of this work owned by others than the author(s) must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from [permissions@acm.org](mailto:permissions@acm.org).

*MuC’20*, September 6–9, 2020, Magdeburg, Germany

© 2020 Copyright held by the owner/author(s). Publication rights licensed to ACM.

ACM ISBN 978-1-4503-7540-5/20/09...\$15.00

<https://doi.org/10.1145/3404983.3409997>

## 1 INTRODUCTION

Religions can be seen as ways of interpreting the world. The associated religious rituals are, then, ways of turning these interpretations into objects and actions. Thus, religious rituals could be seen as seeking ways of making intangible beliefs about the world (e.g. ‘sharing is good’) tangible: as objects and experiences (e.g. breaking the bread at supper). This is an interesting parallel to the design of Tangible User Interfaces (TUIs), which often also seek to transform intangible, digital information into physical experiences. This parallel motivated us to investigate possible implications of one for the other: could we apply the principles of designing TUIs to the design of religious rituals? Both areas might benefit from such an effort. Religious rituals could inspire the design of contemplative and spirituality-related TUIs, while TUI design might provide fresh ideas for religious rituals. Intrigued by the potential of this mutual inspiration and guided by the ongoing feedback of a theologian in our team, we engaged in the ‘Human-God Interfaces’ project.

## 2 BACKGROUND

Various HCI research projects, with increasing scrutiny [5, 6], investigate how digitally connected technologies and religion can learn from each other. Some of these endeavors involve the organizational use of digitally connected technologies in religious institutions [16, 38], others investigate quasi-religious practices in engineering and design communities [1]. Most work in this field is, however, concerned with two topics: *supporting religion through HCI* and *HCI learning from religion*.

### 2.1 Supporting Religion through HCI

New ways of religious interactions are being researched by the HCI community [2]. Fagerjord, for example, proposes a system to augment churches with location-aware sound apps [14]. Eikelboom et al. investigate how online and offline prayers differ in



**Figure 1:** a) *The Balance of Equality*: a weight-shifting seesaw that counterbalances people’s weight. b) *The Flame of Prayers*: a color-changing flame that serves as a feedback mechanism for prayers. c) *The Light of Connectedness*: a remotely lid light that gives people a sense for others thinking of them.

content [13]. Wyche et al. discuss a system for Muslim prayer support [35, 36], Gaver et al. propose a similar system for cloistered Catholic nuns [15]. In a design fiction project, Blythe and Buie also present chatbots for spiritual advice [3]. Petrelli and Light investigate how family rituals can be augmented by technology [29], Odom et al. investigate the topic of bereavement [27], as well as Massimi et al. [24], Moncur and Kirk [26] and Brubaker and Vertesi [4]. Woodruff et al. present interesting findings on the cross-effects of sabbath day and home automation [34]. Interestingly, the field of TUIs has found only sparse application to traditional religious rituals – most of the aforementioned projects are screen-based.

## 2.2 HCI Learning from Religion

Other research activities explore how HCI can learn from religion. Sas et al., for example, investigate how users can be supported in letting go of digital objects [31]. Other projects investigate the facilitation of remembrance [32] and how large displays are used in megachurches [39]. While mutual inspirations of Catholic religion and HCI are often highlighted as reciprocally beneficial [37], more research has been argued to be necessary [7]. This appears to be a worthwhile undertaking, as it may help to create user experiences that ‘facilitate feelings of awe, wonder, transcendence and mindfulness’ [8]. All of these projects show how the potential of thoughtfulness, self-reflection and belief for HCI. Interestingly, HCI research projects investigating the overlaps of TUI design and Catholic rituals appear to be sparse. In the ‘Human-God Interfaces’ project, we investigated this topic further.

## 3 PROTOTYPES

In a 13-week design project, we designed seven objects. Each explores a different aspect of Catholic religious practices, beliefs and rituals. Our project was structured into a research phase, a concept phase, a design phase, and a documentation phase.

### 3.1 The Balance of Equality

*The Balance of Equality* is a seesaw that balances out the weight of the people sitting on it (Fig. 1a). Its design is based on the concept of all people being equal. It was inspired by HCI research investigating weight shift in actuated furniture [17]. Technically, it consists of a seesaw mechanism with an integrated, movable weight. This weight

is conceptualized to be motorized, counter-balancing weight differences of two people sitting on it. Our prototype is non-functional. In Catholic theology, the value of a person is not determined by physical or social parameters. According to GEN 1, 26f., every human being possesses an absolute, God-given dignity: people are not considered to be identical, but equally valuable. According to Catholic theology, faith is about accepting the boundless, unconditional love of God. In this regard, children are often considered to be more faithful than adults, who may believe that love and attention cannot be taken for granted and thus must be earned. These considerations inspired the objects’ design, allowing children to be on ‘eye level’ with adults when sitting on it.

### 3.2 The Flame of Prayers

*The Flame of Prayers* is a fireplace for praying which changes the color of its flame (Fig. 1b). It is inspired by HCI research that investigates subjectivity-embracing styles of feedback [10], as well as color-changing flames as an output medium [25]. It is based on the idea of giving a feedback to praying people, yet leaving its interpretation open. It encases an ethanol torch underneath a movable sieve for burning chemicals. When burned, the chemicals change the flame’s color to red (strontium), blue/green (copper sulfate), and purple (lithium) tones. No explanations for possible meanings of the colors are provided to the praying people, their interpretations are purely subjective. Our prototype is semi-functional: it can change its flame’s color as described above, but it needs to be operated manually. In Catholic theology, praying traditionally means addressing God with petitions. Today, prayer is often rather understood as self-reflection, which may, for example, also result in gratitude. The prototype’s design was chosen for its collaborative qualities: as the flame’s colour does not provide a clear feedback to a prayer, it can foster discussion among praying people.

### 3.3 The Light of Connectedness

*The Light of Connectedness* is a pair of wirelessly connected oil lamps (Fig. 1c). Their design is based on the idea of lighting a candle for another person. It is also inspired by HCI research investigating telepresence by ambient, physical means [28]. Technically, one lamp contains an electric lighter which is wirelessly triggered by a light sensor in the other lamp. Lighting one lamp will remotely light also the other. The prototype is fully functional. Catholic theology has a



**Figure 2:** a) *The Chests of Mindfulness*: fasting as a community-driven, ‘internet of things’-enabled activity. b) *The Box of Wishes*: a distribution system for wishes among praying people. c) *The Candle of Sins*: the community’s sins, melted together into an Easter candle. d) *The Wall of Confessions*: a place for semi-public confessing.

long history of intercessory prayer, with which one turns to God for the benefit of others. Traditionally, these prayers are accompanied with the lighting of a candle. Originally, this ritual had a sacrificial character. Today, this ritual is often performed to create a feeling of a spiritual closeness. The *Light of Connectedness* allows users to perform this action over a distance, physically lighting a candle in an absent person’s home or on their grave. It thereby seeks to enable people to create spiritual closeness with a physical proxy.

### 3.4 The Chests of Mindfulness

The *Chests of Mindfulness* are connected, motorized boxes which encourage collective fasting (Fig. 2a): after placing an object that one wishes to fast into one’s chest, its lid will close. At this point, a signal is sent to another random chest, located in someone else’s home, which will then open its lid. Thus, being able to end one’s fasting depends on others to begin theirs. It is inspired by HCI research investigating how to foster reflection [11, 20] through physical restriction and increased effort [18]. Our prototype is fully functional, consisting of three chests which are connected through wires. In Catholic theology, fasting is based on several motives. Historically, the great feasts – Christmas and Easter – were prepared with fasting periods of several weeks. Today, fasting often has a more experimentation-related purpose: in response to current lifestyles of overabundance, voluntary renunciation should lead to greater freedom from harmful consumption. The *Chests of Mindfulness*’ design was chosen for its tangibility (e.g. ‘locking in’ the objects to be fasted) and its collaborativeness (e.g. depending on others to end one’s fasting).

### 3.5 The Box of Wishes

The *Box of Wishes* is a system that distributes wishes among praying people (Fig. 2b). It is inspired by HCI research investigating systems that encourage altruism [22, 23]. To use the *Box of Wishes*, users note a wish on a sheet of paper, alongside their phone number, and insert the sheet into the box’s upper slot. In exchange, they receive another person’s wish from its bottom slot. This person is notified via text message that their wish is now in human hands. The part containing the phone number is cut off the sheet before dispensing the wish. Our prototype is non-functional.

Today, prayer is often misconceptualized as a request for things one cannot accomplish oneself. However, according to Catholic theology, the biblical passage ‘Ask, and it shall be given you’ (LUKE 11:9) does not mean the simple fulfillment of a wish. It is followed by

a statement that the praying person will receive the ‘Holy Spirit’: they should see the situation in the light of faith, be comforted and find the necessary strength to handle the situation themselves. This can also include getting help from other people, even if this is difficult. The *Box of Wishes*’ design depends on collaborativeness: wishes are not ‘sent to God’, but to other people, who may then take responsibility for it.

### 3.6 The Candle of Sins

The *Candle of Sins* is a collective, physical effort of reflecting on sins (Fig. 2c). Inspired by HCI research investigating token-based thoughtful and reflective interaction [9, 12, 19], its design is based on the idea of collecting sins in the form of small wax pieces in a vase at home. Before Easter, all community members bring their vases to church. All wax pieces are then melted into an Easter candle. The mold is functional. Several candles were created with it. In Catholic theology, forgiveness of sins is a central concept. Confessing one’s sins is not considered to effect the (unconditional) love of God. However, it transforms the forgiveness of sins into an individual celebration. Liturgically, this motif also appears in the Easter Vigil, where the blessed Easter candle is lit. The light of the candle, with which the worshipers light their own candles, is to illustrate how God’s forgiving love propagates in the congregation. The *Candle of Sins* is another interpretation of this ritual. Dropping pieces of wax into a vase to reflect one’s deeds may also provide the tangible experience of being freed from them. The community-based collection of wax and the burning of the candle underlines the societal aspects of reflecting one’s deeds.

### 3.7 The Wall of Confessions

The *Wall of Confessions* is a semi-public place for confessing one’s sins (Fig. 2d). It is inspired by HCI research on outdoor interactions with community content [21, 33]. Its design is based on the idea of sins being washed away by the rain: a person wishing to confess writes their sins on one of the wall’s plates. After some time, the wall – which is placed outdoors – will be washed clean by the rain. In Catholic theology, although the forgiveness of sins is celebrated individually, confession also has a social dimension. Through confession, sins are not undone. They are only reflected upon. The confessor thus remains in an ambiguous state: their deeds are not destroyed, but justified before God. The *Wall of Confessions*’ design turns this concept into an experience: the sins, being washed away by the rain, symbolize the slow decay of a bad deed’s consequences.

<i>Prototype</i>	<i>Everyday object</i>	<i>Belief</i>	<i>Unknowable element</i>
<i>Balance of Equality</i>	seesaw	'All humans are equal.'	What determines the balancing?
<i>Chests of Mindfulness</i>	box	'Fasting is a social activity.'	Who ends 'my' fasting, and when?
<i>Flame of Prayers</i>	fireplace	'Prayers are not answered in clarity.'	What does which color mean?
<i>Light of Connectedness</i>	lamp	'God's love manifests in people.'	Will the light that I light up be seen?
<i>Box of Wishes</i>	letterbox	'Wishes can only be fulfilled through inspired people.'	What will the receiver of my wish do about it?
<i>Candle of Sins</i>	candle	'Collaboratively reflecting upon our sins can lessen their impact.'	Which sins did other people reflect upon by putting in their wax pellets?
<i>Wall of Confessions</i>	wall	'Sins also should be forgiven by the community.'	Who will read my confession before it gets washed away?

**Table 1: All prototypes were designed following the same 'recipe': a well-known everyday object that incorporates a Catholic belief and includes at least one 'unknowable' element.**

## 4 DISCUSSION

The 'Human-God Interfaces' project was a tightrope walk: neither did we aim to revolutionize the Catholic church, nor did we merely aim to renovate it on the surface. Rather, we aimed for redesigning its rituals while maintaining the underlying beliefs. All of the presented objects follow the same 'recipe': an *everyday object* that embodies a *belief* and includes at least one *unknowable* element. The latter appeared to be important for enabling the 'human-God' experience: it could be random, it could be determinism, but it also could be God. Being unable to know may open a space for believing. This recipe was also inspired by Rose's concept of 'enchanted objects': well-known everyday objects with new functionalities [30]. Furthermore, all presented designs aim for the goals of providing *tangibility* and encouraging *collaborativeness*. It appeared to us as important to create 'physicalizations' of abstract beliefs, in order to augment the ritual experiences with a palpable, bodily component. Collaborativeness was considered to be an important design goal as well, as most of the rituals were either traditionally community-based, or could be enriched through other people's involvement (e.g. discussing the meaning of the flame's colours in the *Flame of Prayers*, or the ending of the fasting when using the *Chests of Mindfulness*). These principles could also be inspiring for designing more thoughtful styles of human-computer interaction.

## 5 USER REACTIONS

In a first exhibition in Wuppertal, Germany, the objects were presented to the public. During the opening night of the exhibition, ca. 200 visitors were shown the objects in guided tours, each tour lasting about 30 minutes. Each object was shown and explained to the visitors. After the tour, they were asked for their opinion and

concerns about the envisioned rituals. Visitors embraced the idea of redesigning Catholic rituals from a 'modern' point of view and especially enjoyed the chosen approach of 'tangibility'. The objects fostered discussions about which parts of Catholicism could (and should) be redesigned, and which should not. While some visitors also expressed concerns about redesigning such heavily traditional rituals, the majority of the feedback was constructive.

## 6 CONCLUSION AND OUTLOOK

We presented seven experimental objects that take on different Catholic rituals from a 'tangibility' oriented design perspective. Each object is concerned with a different aspect of the Catholic religion and proposes a new, physical way of religious practice. It appeared to be of utmost importance to handle the underlying beliefs and values with care while making a proposal for how to modernize the ritual.

We also presented the 'recipe' that emerged during our design process: taking a familiar everyday object, embedding a traditional Catholic belief and including an unknowable element in the interaction. This recipe might be helpful for future research: such future research might, for example, investigate how this 'recipe' might be applied in the design of objects for modernized forms of rituals from other religions (e.g. Judaism, Islam or Hinduism).

During the next year, the objects will be presented in different exhibitions, which will likely spark further discussions. We hope that the presented designs serve as an inspiration for designing rituals of thoughtfulness and reflection. At the same time, we believe that these designs can also serve as an inspiration for future Human-Computer Interactions. Making these more thoughtful and reflective may be a worthwhile undertaking.

## REFERENCES

- [1] Morgan G. Ames, Daniela K. Rosner, and Ingrid Erickson. 2015. Worship, Faith, and Evangelism: Religion As an Ideological Lens for Engineering Worlds. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing (CSCW '15)*. ACM, New York, NY, USA, 69–81. <https://doi.org/10.1145/2675133.2675282>
- [2] Genevieve Bell. 2006. No More SMS from Jesus: Ubicomp, Religion and Techno-Spiritual Practices. In *UbiComp 2006: Ubiquitous Computing (Lecture Notes in Computer Science)*, Paul Dourish and Adrian Friday (Eds.). Springer Berlin Heidelberg, 141–158.
- [3] Mark Blythe and Elizabeth Buie. 2014. Chatbots of the Gods: Imaginary Abstracts for Techno-Spirituality Research. In *Proceedings of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational (NordiCHI '14)*. ACM, New York, NY, USA, 227–236. <https://doi.org/10.1145/2639189.2641212>
- [4] Jed Brubaker and Janet Vertesi. 2010. Death and the Social Network. (July 2010).
- [5] Elizabeth Buie. 2018. *Exploring Techno-Spirituality: Design Strategies for Transcendent User Experiences*. Doctoral. Northumbria University.
- [6] Elizabeth Buie. 2019. Let Us Say What We Mean: Towards Operational Definitions for Techno-Spirituality Research. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems (CHI EA '19)*. Association for Computing Machinery, Glasgow, Scotland UK, 1–10. <https://doi.org/10.1145/3290607.3310426>
- [7] Elizabeth Buie and Mark Blythe. 2013. Spirituality: There's an App for That! (But Not a Lot of Research). In *CHI '13 Extended Abstracts on Human Factors in Computing Systems (CHI EA '13)*. ACM, New York, NY, USA, 2315–2324. <https://doi.org/10.1145/2468356.2468754>
- [8] Elizabeth A. Buie. 2014. User Experience and the Human Spirit. In *CHI '14 Extended Abstracts on Human Factors in Computing Systems (CHI EA '14)*. ACM, New York, NY, USA, 335–338. <https://doi.org/10.1145/2559206.2559962>
- [9] Karen Anne Cochrane. 2019. Reconnecting the Body and the Mind: Technology to Support Mindfulness for Stress. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems (CHI EA '19)*. ACM, New York, NY, USA, DC05:1–DC05:6. <https://doi.org/10.1145/3290607.3299083>
- [10] Jill Coffin. 2008. Robotany and Lichtung: A Contribution to Phenomenological Dialogue. In *TEI '08: Proceedings of the 2nd International Conference on Tangible and Embedded Interaction*. ACM, Bonn, Germany, 217–220. <https://doi.org/10.1145/1347390.1347439>
- [11] Katie Derthick. 2014. Understanding Meditation and Technology Use. In *CHI '14 Extended Abstracts on Human Factors in Computing Systems (CHI EA '14)*. ACM, New York, NY, USA, 2275–2280. <https://doi.org/10.1145/2559206.2581368>
- [12] Audrey Drolet, Thomas Lemonde-Marzell, Pablo Matos Da Silva, Kim Lamontagne, and Marjorie Bédard. 2019. SENTIÖ: Reconnect with Yourself to Better Connect with Others. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems (CHI EA '19)*. ACM, New York, NY, USA, SDC07:1–SDC07:6. <https://doi.org/10.1145/3290607.3309689>
- [13] Fabian Eikelboom, Paul Groth, Victor de Boer, and Laura Hollink. 2013. A Comparison Between Online and Offline Prayer. In *Proceedings of the 5th Annual ACM Web Science Conference (WebSci '13)*. ACM, New York, NY, USA, 61–64. <https://doi.org/10.1145/2464464.2464505>
- [14] Anders Fagerjord. 2011. Much: Presenting Roman Church Music in Hand-Held, Locative Hyper-Audio. In *Proceedings of the 13th International Conference on Human Computer Interaction with Mobile Devices and Services (MobileHCI '11)*. ACM, New York, NY, USA, 617–622. <https://doi.org/10.1145/2037373.2037470>
- [15] William Gaver, Mark Blythe, Andy Boucher, Nadine Jarvis, John Bowers, and Peter Wright. 2010. The Prayer Companion: Openness and Specificity, Materiality and Spirituality. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '10)*. ACM, New York, NY, USA, 2055–2064. <https://doi.org/10.1145/1753326.1753640>
- [16] Rebecca E. Grinter, Susan P. Wyche, Gillian R. Hayes, and Lonnie D. Harvel. 2011. Technology in Protestant Ministry. *Comput. Supported Coop. Work* 20, 6 (Dec 2011), 449–472. <https://doi.org/10.1007/s10606-011-9136-0>
- [17] Erik Grönvall, Sofie Kinch, Marianne Graves Petersen, Majken K. Rasmussen, Erik Grönvall, Sofie Kinch, Marianne Graves Petersen, and Majken K. Rasmussen. 2014. Causing Commotion with a Shape-Changing Bench: Experiencing Shape-Changing Interfaces in Use. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, 2559–2568. <https://doi.org/10.1145/2556288.2557360>
- [18] Marc Hassenzahl and Matthias Laschke. 2015. Pleasurable Troublemakers. In *Steffen Walz and Sebastian Deterding*. 167–196.
- [19] Courtney Hutton and Shalini Saravanan. 2019. ReMiND: Improving Emotional Awareness for Persons in Recovery. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems (CHI EA '19)*. ACM, New York, NY, USA, LBW0183:1–LBW0183:6. <https://doi.org/10.1145/3290607.3312997>
- [20] Tom Jenkins. 2013. Devotional Gardening Tools. In *CHI '13 Extended Abstracts on Human Factors in Computing Systems (CHI EA '13)*. ACM, New York, NY, USA, 2219–2226. <https://doi.org/10.1145/2468356.2468743>
- [21] Michael D. Jones, Zann Anderson, Jonna Häkkinä, Keith Cheverst, and Florian Daiber. 2018. HCI Outdoors: Understanding Human-Computer Interaction in Outdoor Recreation. In *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems (CHI EA '18)*. ACM, New York, NY, USA, W12:1–W12:8. <https://doi.org/10.1145/3170427.3170624>
- [22] Yeoreum Lee, Youn-kyung Lim, and Hyeon-Jeong Suk. 2011. Altruistic Interaction Design: A New Interaction Design Approach for Making People Care More About Others. In *Proceedings of the 2011 Conference on Designing Pleasurable Products and Interfaces (DPPI '11)*. ACM, New York, NY, USA, 9:1–9:4. <https://doi.org/10.1145/2347504.2347514>
- [23] Kristina Mah and Luke Hespanhol. 2017. Embodying Altruism in Interaction Design: Towards Moralising HCI. In *Proceedings of the 29th Australian Conference on Computer-Human Interaction (OZCHI '17)*. ACM, New York, NY, USA, 592–596. <https://doi.org/10.1145/3152771.3156177>
- [24] Michael Massimi, Wendy Moncur, William Odom, Richard Banks, and David Kirk. 2012. Memento Mori: Technology Design for the End of Life. In *CHI EA '12: CHI '12 Extended Abstracts on Human Factors in Computing Systems*. Association for Computing Machinery, 2759–2762. <https://doi.org/10.1145/2212776.2212714>
- [25] Mónica Mendes, Pedro Ângelo, Valentina Nisi, and Nuno Correia. 2012. Digital Art, HCI and Environmental Awareness Evaluating Play with Fire. In *Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design (NordiCHI '12)*. ACM, New York, NY, USA, 408–417. <https://doi.org/10.1145/2399016.2399079>
- [26] Wendy Moncur and David Kirk. 2014. An Emergent Framework for Digital Memorials. In *Proceedings of the 2014 Conference on Designing Interactive Systems (DIS '14)*. Association for Computing Machinery, Vancouver, BC, Canada, 965–974. <https://doi.org/10.1145/2598510.2598516>
- [27] William Odom, Richard Harper, Abigail Sellen, David Kirk, and Richard Banks. 2010. Passing on & Putting to Rest: Understanding Bereavement in the Context of Interactive Technologies. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '10)*. ACM, New York, NY, USA, 1831–1840. <https://doi.org/10.1145/1753326.1753601>
- [28] Eric Paulos. 2003. Connexus: A Communal Interface. In *Proceedings of the 2003 Conference on Designing for User Experiences (DUX '03)*. ACM, New York, NY, USA, 1–4. <https://doi.org/10.1145/997078.997082>
- [29] Daniela Petrelli and Ann Light. 2014. Family Rituals and the Potential for Interaction Design: A Study of Christmas. *ACM Trans. Comput.-Hum. Interact.* 21, 3 (June 2014), 16:1–16:29. <https://doi.org/10.1145/2617571>
- [30] David Rose. 2014. *Enchanted Objects: Design, Human Desire, and the Internet of Things*. Scribner, New York, NY.
- [31] Corina Sas, Steve Whittaker, and John Zimmerman. 2016. Design for Rituals of Letting Go: An Embodiment Perspective on Disposal Practices Informed by Grief Therapy. *ACM Trans. Comput.-Hum. Interact.* 23, 4 (Aug. 2016), 21:1–21:37. <https://doi.org/10.1145/2926714>
- [32] Daisuke Uriu and William Odom. 2016. Designing for Domestic Memorialization and Remembrance: A Field Study of Fenestra in Japan. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*. ACM, New York, NY, USA, 5945–5957. <https://doi.org/10.1145/2858036.2858069>
- [33] Gavin Wood, Jon Back, Jaz Hee-jeong Choi, Thomas Dylan, and Marti Louw. 2019. Designing for Outdoor Play. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems (CHI EA '19)*. ACM, New York, NY, USA, W18:1–W18:8. <https://doi.org/10.1145/3290607.3299026>
- [34] Allison Woodruff, Sally Augustin, and Brooke Foucault. 2007. Sabbath Day Home Automation: "It's Like Mixing Technology and Religion". In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '07)*. ACM, New York, NY, USA, 527–536. <https://doi.org/10.1145/1240624.1240710>
- [35] Susan P. Wyche, Kelly E. Caine, Benjamin Davison, Micheal Arteaga, and Rebecca E. Grinter. 2008. Sun Dial: Exploring Techno-Spiritual Design Through a Mobile Islamic Call to Prayer Application. In *CHI '08 Extended Abstracts on Human Factors in Computing Systems (CHI EA '08)*. ACM, New York, NY, USA, 3411–3416. <https://doi.org/10.1145/1358628.1358866>
- [36] Susan P. Wyche, Kelly E. Caine, Benjamin K. Davison, Shwetak N. Patel, Michael Arteaga, and Rebecca E. Grinter. 2009. Sacred Imagery in Techno-Spiritual Design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '09)*. ACM, New York, NY, USA, 55–58. <https://doi.org/10.1145/1518701.1518710>
- [37] Susan P. Wyche and Rebecca E. Grinter. 2009. Extraordinary Computing: Religion As a Lens for Reconsidering the Home. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '09)*. ACM, New York, NY, USA, 749–758. <https://doi.org/10.1145/1518701.1518817>
- [38] Susan P. Wyche, Gillian R. Hayes, Lonnie D. Harvel, and Rebecca E. Grinter. 2006. Technology in Spiritual Formation: An Exploratory Study of Computer Mediated Religious Communications. In *Proceedings of the 2006 20th Anniversary Conference on Computer Supported Cooperative Work (CSCW '06)*. ACM, New York, NY, USA, 199–208. <https://doi.org/10.1145/1180875.1180908>
- [39] Susan P. Wyche, Yevgeniy Medynskiy, and Rebecca E. Grinter. 2007. Exploring the Use of Large Displays in American Megachurches. In *CHI '07 Extended Abstracts on Human Factors in Computing Systems (CHI EA '07)*. ACM, New York, NY, USA, 2771–2776. <https://doi.org/10.1145/1240866.1241077>