# “Tuning in and listening to the current”: Understanding Remote Ritual Practice in Sufi Communities

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## ABSTRACT

Design research and HCI increasingly explore techno-spirituality. We investigated Sufi practices of group zikr, a ritual practice of remembrance of God. We focus on zikr groups that offer online or hybrid participation. We conducted a qualitative study using interviews with practitioners and collaborative autoethnography as researchers/practitioners. Our findings surface themes of (i) shared spiritual energy, (ii) sensory experiences' role in spiritual energy, (iii) impact of technological mediation on sensory and spiritual experiences, and the (iv) importance of community. Our discussion contributes design considerations for techno-spirituality around (1) attunement, (2) practical audiovisual suggestions, and (3) ‘sensational forms’. Overall, we offer detailed experiential accounts of entanglements of sensory perception, spirituality, and attunement, and present generative design reflections suggesting avenues of further design research in supporting religious, faith-based, and/or spiritual practices in HCI.

## CCS CONCEPTS

• **Human-centered computing → Empirical studies in collaborative and social computing**.

## KEYWORDS

Religion, faith, spirituality, computer-mediated communication, human-computer interaction, technological mediation, Sufism, Islam

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## 1 INTRODUCTION

HCI and design research increasingly explore faith, religion, and spirituality (FRS) alongside technology, investigating and designing for techno-spiritual interactions as a meaningful part of many people's everyday lives [54]. When COVID-19 forced many social gatherings online, including spiritual rituals, this underscored computing's role in shaping spiritual experiences. Recent work has investigated experiences of Christian online workshop services [70] and how a Buddhist community shifted online during the pandemic [22], showing how experiences of online participation differed significantly from in-person. With HCI's interest in diversifying the contexts and cultures included in research, this suggests a need to continue investigating diverse religious practitioners' use of and experiences with technology.

We investigated Sufi spiritual practices of group *zikr*, a ritual practice of remembrance of God, done online, through individual interviews and collaborative autoethnography. Our research questions are: *What is the experience of practitioners doing zikr online? How does technology mediate that experience? What are opportunities for HCI design for such communities?* To understand experiences of remote participation in zikr, we also compared to experiences of in-person participation. We interviewed participants and used autoethnographic methods to reflect on our own experiences as Sufi practitioners doing zikr online and in-person. Our findings detail how (i) participants described experiencing a sense of shared spiritual energy during zikr, (ii) sensory experiences play an important role in this spiritual energy, (iii) technology mediates sensory and spiritual experiences online, and (iv) community is an important part of both online and in-person participation.

Our discussion contributes design considerations for techno-spirituality: (1) supporting participants' attunement or cultivation of attention as part of the practice of zikr, (2) practical audiovisual suggestions for supporting online zikr experience, and (3) ‘sensational forms’ as a lens, drawn from anthropology of religion [46], that could be a useful bridge for analyzing and designing for meaningful spiritual experiences through HCI and design research. Overall, we offer detailed experiential accounts of entanglements of sensory perception, spirituality, and attunement, and present generative design reflections suggesting avenues of further design research exploring these intersections. Through this, we respond to calls to help HCI grow beyond its dominant secularized and implicitly Christian frame [34, 49], to respectfully recognize and support diverse religious, faith-related, and spiritual practices.

## 2 BACKGROUND AND RELATED WORK

### 2.1 What is zikr in Sufi Islam?

Sufism is a part of Islamic tradition, in the West often described as "mysticism", "esoterism", "asceticism," and other terms. Chittick, a prolific Islamic scholar specializing in Sufism, argues that any attempt to define Sufism is fraught, because of terminology and translation challenges [21]. The meaning of the word Sufi itself has

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been contested over centuries and used in a variety of ways both by proponents and opponents of Sufism. While Sunni, Shia and other Muslims can identify as Sufi, Sufism can also be marginalized within mainstream Islam.

Sufism can be understood as an expression of authentic religious experience [32]. While describing the richness of Sufi traditions is beyond the scope of this paper, we offer a short description of what such authentic religious experience means and how it differs from other aspects of Islam. According to Prophetic tradition of Muhammad (peace be upon him) as well as the Quran, the religion of Islam can be understood to have three basic dimensions: submission (*islam*), faith (*iman*), and doing the beautiful (*ihsan*) [21]. The first two categories encompass legal and doctrinal matters such as voicing testimony of faith, fasting, rules of prayer, etc. This is the speciality of jurists and theologians. The third category, "doing the beautiful", is more difficult to define and is ordinarily not addressed by either jurists or theologians. Sufis focus on this category [21]. As such, Sufism can be understood as "the theory and practice of holistic, experiential knowing of Divine Truth" [5].

Sufi communities usually organize as a group around a teacher. A leader of a Sufi order is called a *pir*, who continues the lineage of the teachings of his/her *tariqa* (school/order). Knowledge is passed down from teacher to student over generations. Some members are formally initiated into the order and take on the responsibility of continuing the lineage and eventually become a *pir*. Over many centuries of passing along Sufi practices and adapting them to the needs of their communities, there have been many different lineages and a great variety of Sufi practices, some continuing to this day.

One of the most important of Sufi practices is *zikr* (ذِكْر, also transliterated "dhikr"), which means "remembrance." Remembrance of God is commanded by the Quran and, according to tradition, the Prophet Muhammad (pbuh) taught different techniques and practices of remembrance, which have been passed down through generations. Later Sufi teachers and schools added to and modified these practices, resulting in diverse zikr practices internationally. The central element of zikr is to recite the Shahada (the foundational testimony of faith), and the Divine names and qualities of God (Allah). Depending on the tradition of a particular *tariqa*, this may include a variety of embodied practices, such as melodic chanting, bodily movement, and/or quiet contemplation.

The Sufi groups we studied practice zikr through chanting and rhythmic recitation while sitting in a group circle, without musical accompaniment, typically as a recurring meeting conducted both remotely and in person. The ultimate goal of practicing of zikr is to connect the human experience to the divine and, eventually, "the 'union' (sic) with God, or the full realization of human perfection..." [21].

Islamic studies scholar Rozehnal describes, "Sufism is best understood as a path to experiential knowledge (*ma'rifa*)... Sufis strive for a direct, intimate, unmediated, and transformative encounter with God" [57, p. 39]. Zikr is one such bodily ritual practice, which we focused on in this study. When zikr practices shifted from in-person to online during the pandemic, and then post-pandemic transitioned to hybrid with in-person and remote participants, we sought to investigate how these forms of technological mediation shape Sufi spiritual experiences [68].

## 2.2 Faith, religion, and spirituality (FRS) in HCI

Recent work in HCI has opened the way to greater diversity, and we wish to highlight these efforts. Naqshbandi et al. call for "making space for faith, religion, and spirituality"because "it is an area warranting further exploration into the richness of ancient wisdom and traditions that resonate with many people in different ways and can offer potential opportunities for rich and meaningful experiences within HCI and design" (p. 63) [49]. As Hammer's paper "Envisioning Jewish HCI" highlights, "The invisible norms of Christian culture - which includes religious, secular, and atheist Christianity - are hard for those raised within that culture to see. This paper asks what it might look like to design human-computer interactions from outside Christian hegemony" (p. 1) [34].

Our paper builds on recent work diversifying HCI. While research in HCI tends to be predominantly secularized, there are calls to pay closer attention to technology's role in FRS [23, 34, 48, 49]. Designs driven by secular values of modernity can reduce religious visibility, sensitivity and performativity in various socio-economic contexts [47]. Researchers study how interactive technologies are used by religious and spiritual communities and how they give rise to a variety of techno-spiritual practices [8], underscored by recent workshops at DIS [45] and CHI [54].

While it can be difficult to clearly define the concepts of faith, religion, and spirituality, Buie et al. proposed some operating definitions. Spirituality can be described as "a person's relationship with the sacred or transcendent, with their ultimate values, with what purpose and meaning that relationship enables them to create in their life; the search for the sacred or transcendent." Religion can be described as "beliefs and practices that support a person's relation- ship with the sacred, whether practised alone or with others" [17, p.7]. The Oxford English Dictionary defines 'faith' as "to give credence to, believe in, trust" [26]. These definitions are useful, yet we recognize the complexity of these concepts that can vary significantly across religions, cultures, and individuals.

Past work explored how existing interactive systems have been re-appropriated for spiritual uses, such online streaming for worship [70] and funeral [67] services, or home automation for Sabbath practices [72]. Our work joins this growing space by investigating the use of computing technology in the Sufi spiritual ritual zikr.

During COVID-19, many religious gatherings shifted online. For example, Claisse and Durrant detail how online communication allowed a Buddhist community to continue practicing their faith during COVID-19 [22]. Richards et al. studied how older adults engaged in social gatherings such as Bible study online [53]. Wolf et al. explored novel technology-mediated worship practices [71]. Caidi et al.'s research on Muslim's experience of Ramadan during COVID-19 showed how technology appropriation and non-use can shed light on meaning-making practices and rituals in religious communities [19]. Researchers also explore how techno-spiritual practices can influence politics and power dynamics in communities. For example, Rifat et al.'s ethnographic research on digital sermons in Bangladesh showed how digital distribution of religious content can create new knowledge infrastructures and counter-publics [55]. Drawing on this work, we investigate how some Sufi zikr gatherings moved online during the pandemic.

Designers work to support religious practices with tangible designs. At TEI, Markum et al. mapped a design space for religious and spiritual tangible interactive artifacts, and examined how tangible artifacts are enrolled in "mediating the sacred" [44]; our paper similarly studies technological mediation of spiritual experience during remote participation.

As examples of tangible FRS artifacts, Gaver et al. designed the prayer companion for the religious practices of a group of cloistered nuns [31]. Uriu, Odom, et al.'s SenseCenser supports memorial rituals in Japan [65]. Uriu and Okude's ThanatoFenestra supports Japanese traditional Buddhist ritual prayer for deceased ancestors [66]. Mah et al. designed a public installation inspired by elements of Tibetan Buddhist ritual interaction to help cultivate compassion [43].

Prior work also offers approaches, concepts, theories, or case studies. Tasa and Yurtsever offer a Sufism-inspired approach to embodied design, highlighting how Sufism uses embodied rituals to help let go of the ego, and calling for greater recognition of the entanglement of embodiment and spirituality [63]. Halperin and Rosner draw from Jewish Kabbalah to propose soulful speculation as an approach for imagining systems and experiences combining technology, the immaterial, and miracles [33]. Akama et al. proposed designing for mindfulness by drawing from Zen Buddhism [6]. Wyche et al. designed a mobile application to help practitioners of Islam experience calls to prayer [73]. Wolf et al. proposed the Blessing Companion and an approach to designing for uncontrollability [69]. Chen et al. used cultural probes to inspire speculative designs combining Taiwanese folk religion and domestic IoT [20]. Byrne et al. take a playful approach to 'spooky' aspects of technology to offer 'otherworldly' considerations as a resource for design [18]. Buie et al. used imaginary abstracts to explore transcendent user experiences [12, 16].

We highlight this growing work diversifying HCI. This research helps expand HCI's growing interest in FRS, which helps diversify the field beyond its predominantly secularized [49], implicitly Christian [34] frames. Our findings focus on examining existing practices and detailing participants' experiences, while our discussion teases out suggestions for design.

Alongside growing interest in FRS in HCI, Islamic studies has seen a recent turn towards objects and materiality in Islamic studies. Growing work focuses on objects, expanding the field of Islamic material culture from traditional, remarkable arts/crafts to unremarkable, everyday objects. Bigelow, building on Ahmed, argues, "the somatic and object-oriented aspects of the culture of Islamic things are as significant in understanding the formation of Islam as the doctrines, texts, and ethics" [5, 9]. Thus, objects in techno-spiritual practice, including networked and computational objects, should be examined as they shape experiential and other kinds of knowledge in FRS.

Beyond Islamic studies, cultural anthropologist Meyer uses the term *sensational forms* to describe religious practices, calling attention to sensory, emotional, and material aspects of religious practices and experiences [46]. In our work, we also attend to sensory, emotional, and material aspects of people's experiences joining zikr remotely. We return to *sensational forms* as a lens in the discussion.

# 3 METHOD: COMBINING INTERVIEWS & DUOETHNOGRAPHY

Our method combines interviews and duoethnography, a form of autoethnography. This builds on the example set by Claisse and Durant, whose study on Buddhist remote ritual practice combined interview and autoethnographic methods [22]. They demonstrate how first-person methods in conjunction with interviews can be useful for articulating nuances of FRS practice for non-practitioners.

## 3.1 Interviews

For the interviews, we recruited interviewees from our own Sufi group in the US and used snowball sampling to reach other Sufi groups in North America, specifically those who practice zikr remotely. We obtained IRB approval from our institution and permission from Sufi group leaders to share recruitment information. Sensitive to intersecting issues of Islamophobia and other axes of marginalization described by our participants, as well as specific instances of harassment or fears of harassment described by participants, we are intentionally vague on reporting specific locations or numbers of groups we engaged, as well as participant demographics, to reduce the potential for targeted harassment.

We conducted semi-structured interviews with individual participants asking about their experiences with zikr: how and why they began joining, what it means to them socially and spiritually, and about the in-the-moment phenomenological and embodied experience of doing zikr. To prompt them to elaborate on their experience of doing zikr, one approach we used during interviews was asking participants to compare in-person versus remote participation in terms of bodily actions, location, activities, sights, and sounds. We also asked about what device configuration they used when joining zikr remotely. All interviewees had done zikr online as a remote participant; all but one had also done zikr in person. We interviewed nine participants on Zoom for about an hour (about 60-75 minutes) each and transcribed the audio. We stopped recruiting new interviewees a few participants after we felt we had reached 'saturation', when each new interviewee presented similar themes. So, from these participants, we have interview transcripts as the data to analyze. Note, we did not conduct an ethnography with or of these participants, nor do we have any ethnographic observational data about these participants' broader lives or activities.

## 3.2 Duoethnography

As authors we also engaged in first-person reflections through duoethnography. Duoethnography is distinct from ethnography, and has been gaining traction in HCI in recent years with the rise of first-person methods in HCI. Duoethnography is a form of collaborative autoethnography in which researcher-participants reflect on their experiences in dialogue, juxtaposing multiple voices [59, 61]. Duoethnography supports a reflexive approach that positions researchers' lived experiences as a way of knowing. Duoethnography refers to a pair of researcher-participants, trioethnography refers to a group of three, and collaborative autoethnography refers to an unspecified number of researcher-participants. Duoethnography has been used to reflect on personal, individual experiences while considering broader systemic issues; e.g., investigations related to sexual orientation [60], intersectional feminism [36], and critical

race theory [37]. Duoethnography has been taken up in HCI, with papers at CSCW using duoethnography to study experiences of self-tracking [29], in Howell's work at TOCHI studying failures in design research [35], at CHI investigating redlining and sustainability [10], at CHI for exploring home IoT [25, 38], at CHI for analyzing discomfort at public cultural heritage sites [7], and at DIS for investigating the role of voice interface Alexa in a queer breakup [39].

For the duoethnographic component of our project, we described our own experiences with zikr to each other and juxtaposed our experiences, in four sessions, each about an hour long. We transcribed recordings. We also took individual autoethnographic reflective notes describing our own experiences with in-person and remote participation, as well as particular technology configurations used. This produced about 2600 words total over about ten months. Transcriptions and notes became part of the data for analysis.

For transcriptions of all interviews, duoethnographic dialogues, and reflective notes, we used open qualitative coding. We draw from Braun and Clarke's reflexive thematic analysis, which treats researcher subjectivity as a resource for the nuanced and situated meaning-making that comprises rich qualitative analysis [14, 15]. At the same time, we draw from duoethnography's call to highlight polyvocality and different perspectives [59, 61]. We began by familiarizing ourselves with the data through rereading transcripts and notes. In the first round of coding, we identified about 630 excerpts referring to about 260 first-round codes detailing highly specific aspects of their choice of technology, as well as quoting words they used to describe their embodied and spiritual experience. We then clustered them into approximately 100 second-round codes. We conducted multiple thematic analysis meetings, in which we discussed codes and reviewed example excerpts to ensure inter-coder agreement. This led to generating initial themes from the second-round codes, and gathering the data relevant to each initial theme. We further developed and refined the themes to ensure they were well supported by the data. Although the second-round codes could likely be further clustered and condensed, we found that we had surfaced enough themes, grounded in the data, to move forward with presenting a subset of selected themes in the findings. Future work could continue analyzing the data to surface additional themes, but for this paper we focused on themes related to technological mediation of spiritual experience.

### 3.3 Researcher positionality

Given the situated and culturally sensitive nature of our work, it is important to reflect on our positionality. Sandjar is a cis-gendered, able-bodied, heterosexual, Asian man. He grew up in a post-Soviet Uzbekistan, a predominantly Muslim society with mostly secular law and political system. Although his immediate family was not strictly observant Muslims, he was exposed to various strands of Islam from an early age, and learned many of the basics of practicing Islam, including learning Quranic verses, prayers, and various rituals as part of everyday life and culture of Uzbekistan. He came to study and then practice Sufism as an adult, many years after immigrating to the U.S. Sandjar began joining the Sufi group during the COVID-19 pandemic both as a continuation of his personal education and as a way to cope with the stress of the global pandemic. He does not know Arabic.[1]

Noura's family is Muslim, Christian, and Jewish. She is a cis- gender white woman, able-bodied, heterosexual, with the privilege of coming from a family in which doing a PhD is not uncommon. As a child, Noura was raised by Muslim and Christian parents in the US Deep South. Her family was mostly secular, unobservant, and tolerant of religious diversity, but the surrounding society was mostly evangelical Christian—Islamophobia and Christian hegemony were painful parts of growing up. She now identifies as Muslim, with a complex and imperfect relationship with Islam. Sandjar and Noura were research collaborators prior to this project. Sandjar proposed this research idea to Noura and invited her to join a Sufi group he attended. Noura's membership in the group has evolved from one of 'visiting researcher-participant' to doing zikr for its own sake. Noura does not know Arabic, only speaking a few common Arabic phrases with family.

## 4 SETTING: ACTIVITIES OF ZIKR IN THE GROUPS WE ENGAGED

To contextualize the findings, we 'set the scene' of how zikr is typically practiced in the groups we engaged. This is based on our duoethnographic reflections. This helps understand participants' self-reports on their experiences in the Findings (Sec. 5) by providing the context of what they and others are actually doing. Furthermore, understanding the specific activities helps articulate the challenges of shifting to remote or hybrid formats. The descriptions of activities here are a synthesis of our field notes, participants' accounts, and our own experiences as researcher-participants doing zikr with multiple groups in-person and online. We emphasize that ways of doing zikr can vary greatly. We aim to describe the activities and setting explored in this project, which should not be interpreted as representative of zikr in general.

In the Sufi groups we engaged, doing zikr consists of sitting in a circle chanting repeated phrases in Arabic or Persian, without musical accompaniment. The phrases are often the names of Allah (e.g., بسم الله الرحمن الرحيم / "Bismillahir rohmani rohim" / "In the name of God, the Most Merciful, the Most Compassionate"), prayers, or religious songs. The 'script' is often but not always the same for each zikr session held by a particular group, and each group has a different 'script'. One person, usually a Sufi teacher (Pir), leads the chanting. The Pir sets the pace and rhythm, and decides when to finish repeating one phrase and move on to the next phrase. When moving on to the next phrase, it is first said by the Pir solo, and then the rest of the group joins in. There can be an overall structure where some points are slower or faster, or the pitch might be higher or lower. For example, in one group, the phrase لَا إِلَٰهَ إِلَّا ٱللَّهُ / "La ilaha illa Allah" / "There is no deity but God" is repeated with accelerating tempo and ascending pitch, leading to rapid repetitions of إِلَّا ٱللَّه / "Illa Allah" / "Only God". This

[1]The Arabic language plays a special role in Islam. The Quran is said to be revealed in Arabic and has been transmitted primarily in Arabic, both as an oral and written tradition. Most rituals and prayers in Islam are conducted in Arabic even when the participant does not know the language.

phrase is part of the Shahada (الشَّهَادَةُ) , the foundational testimony of belief for all Muslims. Overall, zikr consists of repeating words and phrases that are in a sense very basic, familiar, or obvious in Islam, but also foundational, essential, and important—befitting zikr's literal translation as "remembrance" (of God).

Not all zikr participants in the groups we engaged spoke Arabic. Some groups offered text material of interlinear translations, line-by-line showing the text in Arabic, the pronunciation in English characters, and the translated meaning in English. The pronunciation helps participants say the chants, while they can refer to the meaning in translation. After the 'script', there could be additional prayers spoken by the Pir, followed by an open time in which other participants can add their own prayers aloud or silently in the language of their choice. These could be quoting specific prayers from religious sources, or spontaneous specific prayers relevant to the individual's or community's circumstances.

*In-person zikr.* The location could be the Pir's house or an event space. People typically sit cross legged on the floor, optionally on cushions. People can also sit on chairs or sofas, depending on individual needs or the arrangement of the space. Afterward, there might be tea or coffee and a small sweet food treat (usually dates), as people chit chat for a while before leaving. Text material might be available as paper printouts.

*Online zikr.* When the pandemic started, some zikr groups transitioned online. For online zikr when all participants are in separate locations, a typical setup would be that everyone is muted except for the Pir, to avoid audio feedback and delays. The Pir initiates the chants, and participants follow along. So, everyone hears only the Pir's voice and their voice, not the voices of the whole group. Another option, with the same mute/unmute configuration, is that the Pir plays a recording, and everyone chants along with it. Pirs and participants have different preferences and make different decisions about whether to keep their cameras on or off, which we describe further in the Findings (Sec. 5). Text material might be shown via video call shared screen for participants to follow along. To free up the Pir to focus on leading the zikr, they might designate another more familiar participant, who already has access to a digital copy of the text material handy, to share the text on the screen and progress through text in sync with the progress of the zikr.

*Hybrid zikr.* At the present time, as many gatherings have returned to in-person, some zikr groups continue to offer zikr in a hybrid format. Some attendees come in person, and others join remotely. A laptop with camera and microphone enabled shares the in-person zikr activities in a Zoom call. Remote participants can join the Zoom call, stay muted, and choose whether to have their camera on or off. Depending on the group, there might be social moments before and/or after zikr when remote participants unmute their microphones and greet each other.

# 5 FINDINGS

Having detailed the activities comprising zikr (Sec. 4), we recount how participants describe the experience of doing these activities of zikr as feeling shared spiritual energy (Sec. 5.1), considered essential to zikr. Then, we analyze the important role of the sensory (hearing, seeing, etc.) in supporting the feeling of shared spiritual energy (Sec. 5.2). This leads to unpacking how remote participation in online or hybrid formats changes the sensory aspects and thus changes the spiritual experience (Sec. 5.3). Finally, we discuss how remote Zikr practice shapes the participant's sense of community and enriches how they experience intentionality. (Sec. 5.4).

## 5.1 Shared spiritual energy

Almost all participants (P1, P2, P3, P4, P5, P7, P8, P9, and authors) talked about a sense of shared spiritual energy during zikr. They used words such as "energy," "vibration," or "resonance," when describing the experience of zikr. For example, P1 said:,

> *"Sometimes the experience I have during zikr, I feel something in my, like a vibratory experience in my body. ... Being able to have that resonance with folks.. being able to hear one another's voices next to one another..." —P1.*

Here, the participant describes the sound of one another's voices as contributing to the energetic resonance or vibratory experience. P4 described:

> *"Getting really deep into the meditation. ... **feel the energy** of other people, and to have the reaction in your body from getting the energy from other people, like a sharing of energy thing." —P4*

In other words, P4 describes feeling the energy of other people as a shared energetic experience. P7 described:

> *"Sometimes I do feel that there's a sort of collective, **a more vibrant, collective energy** ... It truly is an ineffable thing... you're just in that moment, at the time, doing what you're doing with other people and being with the divine." —P4*

This participant points out the ineffability of this sense of collective energy. Another participant described the experience of doing zikr as follows:

> *"It's almost like **this energy that just kind of radiates among all of the people** ... it's just the energy of being able to come together and all work together ... when I'm part of that, the chanting and everything, ... It's almost like you're a satellite dish. I'm an engineer, so this is where my brain goes, but I almost feel like.. you're gathered around the satellite dish, and then you're **beaming up to connect to the energy** that everybody is concentrating on. And for me personally, the concept of God is more like the concept of a higher power. So, being able to have concentrated time where you actually intentionally connect with that... Sometimes it's hard for me to remember to do stuff, and so it's like an intentional time to remember to connect, and then also to be able to leverage other people who are trying to do the same thing with you." —P3*

P3 describes the collective experience of zikr as radiating energy and beaming or directing this energy to connect to the concept of a higher power, using the analogy of a satellite dish. The activities of zikr (Sec. 4), mostly sitting and chanting repeated phrases (for which P3 mentioned often chanting 'silently' or 'internally'), are described as meaning so much more.

P8, a Sufi teacher (Pir), described how the shared spiritual energy helps support the purpose of zikr, using an analogy of a mirror:

> *"The whole point of zikr is to* ***get over yourself, right, to leave your selfish concerns*** *and your egoistic thoughts behind, at least for a little while, and put your focus and your energy and your thoughts on something else. And that something else is like.. when you look at something in a mirror. If you can't look at something directly, you can look at something in the mirror, right? And when you're doing that, you're both seeing the object that you can't look at directly, and you're seeing the mirror. Right? So it's like that with zikr. You are focusing on God, and you're using the names of God, and you're reciting the names of God. In that sense your focus is on God. But you can't focus on God directly, fully, all the time. And so you have a dual focus. And the dual focus is on the people around you. They're like the mirror. God is like the image that you're trying to to see. But to do that you have to be directing your energy in the right way toward the mirror. And so* ***the people that are with you in a circle of zikr, their breath, their presence, the energy and devotion*** *they bring to it, acts like a mirror for you, if it goes well. And in combining your voice with their voice, your intention and energy, with their intention and energy, it* ***really helps you to just put yourself aside for a while.*** *... So that's what zikr is about. That's what the inner purpose of it is." —P8*

Above, P8 describes how the group collectively combining and directing their 'voice', 'breath', 'presence', 'energy', 'intention', and 'devotion' toward a shared focus on God. Speaking as a Sufi teacher here, P8 is not explaining their personal individual experience of doing zikr, but rather explaining, *"the whole point of zikr"* and what should happen *"if it [zikr] goes well"*. Treating this Sufi teacher not only as one participant, but also as an expert in this way of doing zikr, and combining this with the experiences described by many other participants, it seems this sense of shared spiritual energy is a very important part of zikr. It is the kind of experiential knowledge that Sufi practice seeks to foster. Overall, the experience of zikr involved a sense of collective, shared spiritual energy for many participants, which is considered a very important part of the practice. As design researchers aim to engage more diverse and varied human experiences, from ineffable aesthetic experiences [13] to tangible religious artifacts [44], the shared spiritual energy of spiritual practices such as zikr merits further investigation.

## 5.2 Sensory experiences' role in spiritual experience

In this section, we analyze how sensory modalities were entangled with the feeling of shared spiritual energy. When describing feeling shared spiritual energy, participants typically referred to hearing, seeing, or other sensory modalities as part of that feeling.

For example, when describing feeling shared spiritual energy, P1 describes:

> *"that resonance with folks.. being able to* ***hear one another's voices*** *next to one another ... When we're sitting together in a circle, you can feel each other in a deeper way, and you can be more connected with the ebb and flow of this, and attuning to one another's voices..." —P1*

P1 describes hearing others' voices together, and attuning to that, as part of the experience of shared resonance or shared spiritual energy.

Overall, participants' account of their sensory experiences are so entangled with the feeling of shared spiritual energy, that in analyzing and writing we often must return to the same moments in interviews, the same quotes describing shared spiritual energy—pointing to the importance of sensory experiences in fostering spiritual experiences.

Another participant, P5, also pointed to the importance of the auditory in fostering the shared energy. P5 is a student of P8 and has been initiated as a teacher in this group. P5 usually attends the zikr held by P8, but sometimes leads this zikr group if P8 is unavailable. P5 said,

> *"Even when I shut my eyes, it's just the energy. I don't know, it's just.. a feeling.* ***The voice, we're all kind of saying the same thing in unison. The hearing,*** *being together." —P5*

P5 noted that seeing also matters for them, but that even when they shut their eyes, hearing the collective chanting in unison is part of that 'energy', that 'feeling'—a feeling of spiritual energy.

P5 described how the shared auditory and energetic experience became intertwined:

> *"When everyone's sort of in sync, you know, because you have the, usually it's [the teacher] who is leading the zikr, and he is sort of..* ***the cadence, and the volume, like all of that stuff, is influenced by the energy in the room****, and he's sort of reading everyone's energy, and that determines the rhythm, the volume, and all that stuff. And so everyone is doing that, even though he's leading it, he's also using other people's input to guide the zikr, and we're all reacting to each other's energy." —P5*

Here, P5 highlights the sonic temporal rhythm and auditory volume as part of being "in sync" and shared spiritual energy. In other words, the energy is not experienced as an abstract concept, it is rooted in how the sound is created and perceived by the participants.

P2 describes, *"I'm really attuned to the* ***music****."* When asked to describe the experience of listening during zikr, she continued:

> *"I think [the teacher]'s* ***voice*** *has improved over the 13 years as he has deepened. And I find that both comforting and a great joy that his spiritual practice is purifying his essence, and nowhere more is that seen than in* ***the human voice, both spoken and in singing****. He really has the voice of a master, not in the sense that maybe he's the best singer in the world. It doesn't really have anything to do with performance. It has to do with the depth of his prayer, and his sincerity comes through everything he does. So then it's a great pleasure in a deep sense of the word, spiritual pleasure." —P2*

P2 finds great joy in the musical aspects of zikr, especially in the teacher's voice, which she describes as conveying his deep spirituality—again linking the sonic with the spiritual.

For Noura, the experience of in-person zikr bears similarities to her experiences of shared music-making. During zikr, she listens closely to how her voice sounds in relation to the group's and especially the Pir's in terms of pitch, rhythm, and volume. She adjusts her own voice to achieve a desirable blend. While many sections do not require a specific pitch, people's voices fall into different pitch ranges and create a blend beyond tonal harmony. The pacing of the repeated phrases, and the volume, can vary according to the group and the leadership of the Pir, creating and responding to different energies and intensities.

While P2 emphasized the sound of the human voice, P3 recalled a special moment of more-than-human sound:

> *"I mean for me the sound is something that is so important for zikr, because for me it's not just the sound of the humans, but it also ends up connecting to things outside of us... One time we were doing doing zikr and we had a storm outside, and* ***the sound of our voices****, it became hard to distinguish... We were doing one of the sections of the zikr, and it sounded almost like, the softer part* ***sounded like the rain****, and the more, you know, brusque part* ***sounded like the thunder*** *outside, and it was just really cool. I'd never had an experience like that before, and so that's to me where sound is important. And then for me personally, I'm a musician, and so sounds to me becomes like almost like music that's in my head, and so that helps me like, you know, process and and connect to you know what's going on. So sound is very important to me." —P2*

P3 recalls how their voices blended in with the natural phenomena outside, and how this was part of feeling connected beyond themselves. In describing their feeling of shared spiritual energy with the satellite dish analogy (Sec. 5.1), P3 had said, *"the concept of God is more like the concept of a higher power,"* so feeling connected beyond themselves seems related to feeling connected to their concept of God, as part of the shared spiritual experience.

Visual stimuli also played a role. When asked if they kept their eyes open or closed during zikr, participants typically answered that they did some of both. Participants would often keep their eyes closed for more inner focus. If they had sections of the zikr memorized, they could close their eyes and recite from memory; for parts not memorized; they could open their eyes to refer to the text material. For example, as P2 explained:

> *"The rest of the time I prefer to close my eyes... it's less distracting... you sort of enter your own, my own space." —P2*

Participants also mentioned opening their eyes to sync with the group:

> *"I open my eyes just to sort of, if I want to get a cue of whether we're coming to the end or something like that. But most of the time I just go internally." —P2*

Similarly, P7 described, *"Sometimes when I'm you know,* ***I'm just in the moment, I'll close my eyes,****"* yet at other times they found a benefit in opening their eyes:

> *"If I open my eyes, and I see [the teacher] and friends, and their bodies are moving with with zikr, that often is a reminder for me to sort of get in touch with, what is my, how is my body responding to that?" —P7*

Both P2 and P7 elaborate how closing their eyes could be part of feeling 'in the moment' while opening their eyes enabled them see others' bodies moving and could prompt them to get in touch with their own embodied experience. This is a point P8 made about zikr requiring "dual focus."

Overall, auditory, visual, and other sensory experiences play an important role in participants' experience of zikr, entangled with their sense of shared spiritual energy as an important part of zikr. By honing in on the sensory experiences and their role in supporting spiritual experiences, we can identify possibilities for visual, sonic, and tangible design researchers to respectfully and carefully engage the sensitive realm of spiritual experience.

### 5.3 Impact of remote participation on sensory and spiritual experience

Here we examine how remote participation differs from in-person participation. We attend to auditory and visual differences and how these relate to the spiritual experience of zikr. We do this because auditory and visual senses were frequently mentioned by participants (Sec. 5.2) as important for the shared spiritual experience of zikr (Sec. 5.1). P4 described the transition her group made going online at the start of the pandemic:

> *"We had to learn by experience. Okay, everyone has to put themselves on mute. Because if everyone's talking, if everyone's audio is going at the same time, there's gonna be all sorts of issues with feedback and delays and whatever. So we found out very quickly that* ***we had to put everyone on mute****. And so basically, that left the option of only having one person do zikr. And then that just was weird. So for that one person, I think, because they they'd be doing zikr, but then they wouldn't be hearing everybody else doing it..." —P4*

The shared experience of hearing everyone chanting together—which so many participants referred to when describing the shared spiritual energy of zikr (Sec. 5.1)—is greatly altered by muting all participants. Most but not all participants expressed a preference for in person zikr. For example, P5 said:

> *"****I prefer in person... the energy****, the community, the people, the community, the energy people give off. And we can harmonize. We can sing together, chant, recite when you're in person. When you're on Zoom you, we can't all be in sync. We have to be on mute. I need the energy of other people. And then I like singing in person. That experience we miss out on." —P5*

P5 expressed needing the energy of other people, which she prefers in person. She explained how on Zoom, sonic elements of chanting, harmonizing, and being in sync are not possible because of the requirement to mute.

Similarly, P1 expressed:

> *"I think there is definitely a difference. I started out attending virtually, and **so the first time I came in person was different in a really good way**, being able to have that resonance with folks, being able to hear one another's voices next to one another. When we're on Zoom, we're all on mute and have just one mic on." —P1*

P1 described how coming in person was *'different in a really good way"* because they could have the 'resonances' of 'voices next to one another'. The audio muting on Zoom significantly detracts from that experience.

P8, a Sufi teacher, said:

> *"**Doing the zikr online really is not the same in terms of the vibrational energy of it**, the acoustic togetherness of it. I don't know how to describe it, but having your own individual voice melt or meld into a fusion with other voices, and the sense that everyone is breathing in the same rhythm as well as saying the same thing, is a really powerful thing, and it doesn't really come across in the same visceral embodied way when it's mediated online." —P8*

P8 points to the importance of the 'acoustic' or sound 'togetherness' of voices blending together as being important for the 'visceral embodied' quality or 'vibrational energy' of zikr, and how this gets lost online.

On the other hand, some participants expressed some advantages to online zikr. P9, another Sufi teacher, described:

> *"One of the pluses about being on Zoom is that, because I'm by myself, I don't have to be worried about someone looking at me, ... I feel less worried about, is my scarf falling off?, those kind of things. ... So **I sometimes feel like I can be inward in a different way**... on the Zoom, I can keep my eyes closed a lot more, but I will still open my eyes to check on the Zoom. ... This is a little bit more freedom when I don't have to worry about if anyone else is looking at me or not." —P9*

P9 typically keeps her camera off when leading zikr, and appreciated not having to worry about whether her scarf (hijab) was staying in proper position while leading zikr. She said that feeling less worried about this helped her "feel like I can be inward in a different way." For P9, camera off could sometimes help enhance the spiritual experience of zikr. Noura also sometimes felt less self conscious in online participation, when she could turn the camera off to blow her nose when she had a cold, or use the camera angle and lighting to obscure her face if moved to tears by zikr.

Yet, P2 preferred to keep her camera on, saying:

> *"Most of the time, let's say 95% of the time I keep [my camera] on. I think it's a presence. It means I'm showing up. I'm showing up, and I'm manifesting myself, and you can look. You can see me, and I'm not goofing off, I'm not doing 25 things at once. I'm doing this, and I think that makes a statement, even if it's a subtle one." —P2*

P2 expressed how keeping her camera on showed her presence and dedicated attention, which she felt was important for zikr. P2 noted a positive aspect with online zikr,

> *"Sometimes being remote, at the end, allows me to **be with the feelings for longer**, because I don't have to dissolve it to be sociable. So occasionally it's turned out that I would have a preference for being online." —P2*

After attending zikr in person, when the zikr is finished, everyone chats for a while before dispersing—the community aspect was also highly valued by many participants including P2—and yet, P2 sometimes appreciated being able to stay alone to hold on to the feeling of zikr. Sandjar also recalled struggling with the transition from zikr to socializing after one particularly intense session that left him needing more time to recenter and refocus.

P7 also mentioned the personal experience of remote participation in zikr. He said:

> *"When I go to zikr, I want to spend quality time with the divine, and, being present in the room with other people, would that be nice? Yes, but I feel **the most important thing is this sort of personal experience with the divine. I can do that at home via Zoom.** It's not quite the same. Again, there are pros and cons of it." —P7*

P7 expresses that the spiritual experience of zikr is still possible with remote participation. P7 also described how remote participation avoids a long and stressful drive. He noted that he felt welcomed but a little socially shy at the in-person gathering.

For P7, while acknowledging that *"it's not quite the same,"* these benefits of remote participation supported him in focusing on zikr.

Overall, while online zikr offered some additional ability to turn inward and hold onto the feeling after zikr, the collective embodied and sensory experiences of zikr are greatly diminished. Instead of voices melding together, only the teacher's microphone is unmuted. Instead of seeing each other in person, people can choose to turn their camera on or off. Instead of sitting together, breathing together, etc., there are only auditory and visual cues online.

As P2 summarized,

> *"There's more juice when you're in person, right? ...it's like being grateful for what we had, and being grateful that **we have something rather than nothing**. Without this technology we would have all just been separated." —P2*

## 5.4 Community, intention, and practice

Consistent with the other studies in HCI and FRS, we find that participating in zikr remotely has experiential disadvantages. However, Sufi gatherings and practice are also an important form of community for participants. Therefore, classifying one mode of participation as more authentic or better, overlooks the fact that each can foster unique ways of being authentic. First, online zikr makes the community accessible for people who could not have participated otherwise. One participant (P6), a mother from Asia who cared for her kids while her partner was on a long trip abroad at the time of this study, joined zikr practice consistently even though it interfered with her childcare obligations.

*"It's early in the morning... My son is sleeping at the early part of [the online gathering]. I don't have to worry about my children a lot... But during the day, they start getting up. So I need to turn my screen off.* ***I need to watch my children while my ears are for focus on.*** *But, I almost always need to do like two things at once." —P6*

For this participant, being part of the community and being the sole caretaker of two children, are not in opposition. Rather, they are part of the participant's everyday, authentic reality. While this may be a unique example of a participant who can't join in-person and has never been in the same space with them, it's not unusual. Local members of the community also foster different relationships, both in person and when they participate remotely.

One participant (P2) has been meeting with her group for over ten years and described the community being like family.

*"It's like being able to bringing the people you love inside of you inside of me. And so because every one of them, of the main core people, I've had profound experiences,* ***I don't see any separation between being in person and being online.*** *These are the people that, we prayed together for so long and with such sincerity, and we all know each other..." —P2*

This indicates that P2 still felt a deep sense of connection with others during remote participation, based on their long term, meaningful shared experiences. And while P2 may be practicing zikr remotely, the meaningfulness of the practice is enriched by the lasting relationships she has built with individual community members over time.

P1 described how remote zikr creates different types of closeness:

*"I feel like. Maybe there's* ***three different degrees of closeness*** *I would feel. And so kind of the furthest one would be the recording. And then,* ***tuning in and listening to the current****, live, one is in between. And then actually being there and participating vocally and listening with my ears to people near me would be the closest." —P1*

For this participant, remote participation opens a range of "closeness" that goes beyond binary judgements about authentic and inauthentic. There were also participants for whom online zikr was just as meaningful and deep as being in person and for whom remote participation offered advantages.

*"It's all about my own personal experience and how deep I wanna go. You know, sometimes, when I do zikr* ***at home, I can really focus****, really well, and sometimes I have other distractions, you know. Sometimes my mind will wander off, and I'll think, what am I gonna have for dinner. And so I find that I can better steer my own personal experience when I'm doing it alone." —P7*

For this participant, the ability to "steer" the experience mattered most, but the participant was also a very experienced Sufi, who has participated in many types of zikr for many years. Therefore what makes the experience authentic is the practitioner's intentionality.

*"And you know there are other people online, and there are people in the room in the [Anonymized's] living room that there is a* ***collective sense of intentionality*** *that we're all present together, whether it be virtually or in reality, and that we are intending to do this thing together, and there is a sense of community, of doing this together." —P7*

Intentionality was one of the recurring themes among other participants and seemed to be a constituent part of community, with each member, finding their own way to cultivate intention individually and collectively.

*"... eventually I got to the point where I would actually feel like it was coming in like the the spirit of the group, and the* ***spirit of the the intention of the worship*** *was actually coming inside of me and calming, and you know, having the the desired effects that you want when you're trying to commune with something higher than yourself." —P3*

Here too, P3 alludes to the fact that intentionality is fostered as part of a group practice and is then transmitted to or reflected on the individual.

This is something we also discussed in our duoethnography sessions:

*"... I think it can help to have a great experienced leader, good audio, co-presence, great technology, etc. but I don't think it's really necessary... I don't think I had a profound experience because of or in spite of the quirks or novelty or particularities of this zikr session. I think it's just like more due to* ***the importance of zikr overall, when done with sincerity of intention****." —Sandjar*

A more poignant example of intentionality and community can be found in the way remote zikr practice became part of Sandjar's personal commitment. Specifically, Sandjar happens travel on long road trips on weekends at the time of zikr gatherings. In these instances, to avoid missing Zikr practice he parks the car at the nearest convenient and safe spot and joins the practice remotely. And while practicing zikr at a noisy gas station with a bad signal may be weaker in terms of sensory experience, it is the intention of continuing the practice that heightens his sense of commitment and intentionality.

It is not surprising that intentionality was meaningful to participants. There is a rich Quranic and prophetic tradition placing emphasis on the intention of actions [50]. Our observations suggest that the techno-spiritual practice of remote zikr broadens modes of participation which in turn enriches the range of intentionalities that individuals can cultivate.

Finally, participants described finding community and acceptance in their Sufi groups. For some participants, this sense of acceptance was highlighted in contrast to experiences of marginalization in other communities, due to varying societal biases against, among others, divorced women, queer people, women and/or queer Islamic teachers, or converts to Islam. One participant described how a different queer Islamic meetup faced online harassment and had to implement stronger cybersecurity protections. Noura also reflected on growing up with Islamophobia in Western society, which again underscores the need for supporting Islamic community.

Contrasting these experiences of fear and exclusion, participants described finding community, even love and acceptance in their Sufi

groups. A single mother appreciated that she could bring her young son to in-person zikr, and her son was welcomed even as a toddler who was sometimes noisy. A mother raising three children while her husband was abroad tuned in online despite the inconvenient time zone, listening in while getting her kids ready for school. A person who identified as both Buddhist and Sufi, never having converted to Islam, also appreciated feeling welcomed in her Sufi group.

# 6 DISCUSSION

Here we unpack how our findings offer insights for design research, both specifically for online zikr practices and more broadly for techno-spirituality.

*Underscoring insights in related work on techno-spirituality.* First, we situate the insights from our study in conversation with related work on techno-spirituality. Claisse and Durrant's study of a Buddhist community's shift to online rituals during the pandemic offers an interesting point of comparison [22]. Both their work and ours use a combination of autoethnography and interviews to investigate community spiritual practices of chanting. We echo their design considerations on the potential of tangible interfaces to support spiritual experiences and remote participation, sense of belonging both within a community of people and as connection with something greater, and the importance of synchronized collective participation (rhythmic chanting) [22]. Our work surfaced similar findings of how these collective spiritual practices can foster positive self-development, supportive community, and the embodied 'vibratory' 'energy' of chanting [22]. We found similar challenges of muting when chanting online, leading to a diminished sensory and spiritual experience for many [22]. Alongside these overlaps, it is important respectfully acknowledge that Buddhism (as in [22]) and Sufism are decidedly distinct traditions, and avoid seeking 'generalizable' recommendations. We also highlight some distinct 'silver linings' of remote participation, surfaced in our study, that can be worth designing for, and elaborate on these in the rest of the discussion.

## 6.1 Tuning attention intentionally: challenges and opportunities for online spiritual rituals

Zikr means "remembrance" (of Allah) and calls on practitioners to direct their attention towards this remembrance. In the groups we engaged, zikr consists of meditative chanting. While prior work on a Buddhist community's shift to online rituals found that "Chanting online with others just does not work" [22, Sec. 4.3.1], a difference in our findings is that some participants expressed benefits of remote participation regarding their spiritual experience. We use these glimmers of beneficial aspects of existing remote participation experiences to suggest design considerations for remote participation in online spiritual rituals. Thus, our discussion reflects on how technology can help not only overcome challenges of remote ritual participation, but may also offer richer or alternative experiences. At the same time, we respect the wisdom of Pirs who emphasized the importance of gathering in-person for zikr (e.g., P8 in Sec. 5.3), and do not claim that remote participation could or should replace that. Here, we elaborate on how our findings surface the importance of shared intention, focus, and attention in zikr.

*Distractions: the opportunity of overcoming the challenge of distraction.* While getting distracted during online participation in spiritual rituals was a challenge for many, the effort and intention of paying attention could also be a meaningful form of personal growth. Many participants found it challenging to pay attention in remote participation, describing juggling care-giving responsibilities e.g., example from findings of P6 in Sec 5.4), getting distracted researching Islamic topics online (P4), or just generally getting distracted (P3). For some, the flexibility of remote participation was important in enabling them to balance their life commitments and continue to participate, even if this meant multitasking with camera off. Yet in another sense, the challenge of overcoming distractions, the disciplined practice of learning to cultivate attention online despite distractions, could also be a meaningful practice of personal growth. Thus, for some participants, the distraction of remote participation served as a productive tension spurring greater efforts to pay attention, which could be beneficial.

Designing tangible devices for religious and spiritual purposes avoids the distractions of being on the computers that do not place people in front of their computer screen, echoing calls in prior work [22, 33] on the potential of further tangible and embodied interaction design in this area. Our study further suggests the need for designing to help people focus during spiritual rituals. Yet, it also shows how, if design were to make it 'too easy' to focus, the experience could also detract from part of the meaning of some spiritual practices, where cultivating a disciplined practice of focus is part of the point. Focusing despite distractions is not a 'problem' to 'solve' through design. Rather, we suggest possibilities for interaction design to engage the challenge of distraction, and the practice of cultivating focus, both inward and outward, as an important experience to design for, with, and through.

*Tuning intention and experience online.* Based on possibilities surfaced in our findings, we suggest ways that designs for online participation in spiritual rituals could support people in shaping their experience and intention individually. Some participants appreciated greater control in shaping their own spiritual experience when joining remotely. For example, P2 described sometimes enjoying how she could "be with the feelings" for longer post-zikr when participating remotely, rather than the in-person experience of post-zikr socializing (Sec. 5.3). P7 expressed, "the most important thing is this sort of personal experience with the divine. I can do that at home via Zoom" (Sec. 5.3). P7 also mentioned how going to his local zikr group in person entailed a long stressful drive each way, and how he felt welcomed but still a relative newcomer in this group, since he had moved to a different region leaving behind his prior zikr group of many years. P2 and P7 both had many years' experience doing zikr, which may have supported their finding ways to beneficially shape their online participation. Yet, this also points to design opportunities for remote participation in zikr.

We suggest that designs for remote participation in collective, synchronous rituals could explore offering a post-event 'mode' of interaction. This could support individuals lingering with the feeling until they are ready to move on. It could support a more gradual transition back into everyday life, perhaps a more gradual process of disconnection. Instead of the sudden or perhaps harsh ending of

a Zoom call, it could entail slowly 'fading out', 'dimming', or otherwise reducing the synchronicity and immersive qualities of the ritual's sensory transmissions, gradually yielding to the sensory stimuli of the remote participant's mundane physical surroundings. Furthermore, different slow and gradual experiences could be intentionally selected by the participants on their journey of self-improvement, rather than passively receiving it as an outcome of a system.

*Looking, listening, noticing: multisensory attunements.* Reflecting on our findings, we tease out opportunities for design to explore supporting participants in attuning to different sensory aspects of spiritual rituals. During the in-person collective chanting of zikr, we found that participants sometimes focus inward on themselves, sometimes outward on the group as a whole, and sometimes outward selectively on a particular aspect. This selective outward attention could entail, as examples, looking at the teacher around points of transition (e.g., P2), listening to one or another person's voice more than others' voices at certain points (e.g., Noura, Sandjar), noticing moments of synchronicity between the group's chanting and the natural environment (P3), or parts of some zikr rituals involving call and response. This looking, listening, and noticing comprise ways of intentionally directing attention, as part of how the sensory experiences of zikr support the spiritual experience of zikr.

We suggest that designing for collective, networked spiritual rituals can explore ways of supporting tuning attention intentionally. How might designs support participants in attending more or less to different aspects of the experience at different moments? This could be intentional based on participants' conscious decision, or perhaps serendipitous aligning with related work in techno-spiritual interaction design that suggests designing for uncontrollability [69]. At least for the contexts we studied, we suggest that this shifting of attention needs to happen subtly and unobtrusively, to avoid interfering with the overall experience and goal of directing attention in zikr. As an example, participant A gazing at the visual representation of participant B for three or more seconds could gradually, subtly increase the volume of participant B's chanting in the audio mix presented to participant A. Additionally, participant B could receive audio or visual feedback indicating that participant A is paying attention to her, reinforcing the sense of reciprocity. Other possibilities could include subtle variations in the way sensory information is transmitted and displayed, such as making some participants' visual representation brighter or dimmer, larger or smaller, or some participants' audio louder or softer. Expanding on multisensory possibilities mentioned by Halperin and Rosner [33], designs could also explore introducing additional sensory modalities to convey, which participants could selectively attune to, e.g., the physical warmth of sitting together and chanting and breathing, the physical swaying movement or other gestures of participants, or the taste of sweets shared after zikr in some groups.

*Multisensory possibilities.* Our findings underscore the importance of sensory experience for spiritual experience both online and in-person (Sec. 5.2). We echo Halperin and Rosner's suggestion to attend to "scents, light, sounds, temperatures, and tastes that orient users inward with immersive aesthetic joy" [33, Sec. 5.2.3]. Although our participants primarily described auditory and visual experiences of chanting together, they sometimes mentioned the literal, physical warmth of sitting together and chanting, and many in-person gatherings end with sharing sweets and a warm beverage; the sweets are uncovered at a certain point during zikr as part of the ritual. This points to design opportunities to explore multisensory religious experiences, by both paying close attention to the role of sensory experience in existing religious practices, and by reimagining sensory possibilities through design.

*Supporting 'freer' or more 'formal' participation online.* Participants' descriptions of online participation as in some ways 'freer' point to opportunities for design. P9 mentioned how, when leading zikr online with her camera off, she felt "a little bit more freedom" because she wasn't worried about anyone looking at her and noticing, for instance, that her hijab might not be staying on perfectly. She described how this helped her "feel like I can be inward in a different way" (Sec. 5.3). Reflecting on her own experiences, Noura felt more comfortable freely emoting when participating remotely, because she could turn her camera on or off, or use the camera angle and lighting, to control degrees of visual privacy (Sec. 5.3). This points to design opportunities for online spiritual practices to support 'freer' or less self-conscious forms of participation.

We suggest that designs for remote participation in religious gatherings could explore supporting participants in 'freer', 'inward' experiences. For example, designs could offer individualized reflective prompts tying the more general religious themes to an individual's specific circumstances. An ongoing personal diary or other means of directing or expressing inward attention and experiences could accompany an individual's view of the online religious gathering. In addition, multisensory experiences discussed in the previous sub-section, could open alternative opportunities for self-presentation. Of course, these additional features would need to be carefully designed to suit the specific aims of a religious gathering, and not detract from attention to the shared event—perhaps appearing in periphery of visual focus, or being presented before or after the main event.

On the other hand, some participants' recountings of online participation as more 'formal' can also inspire future design explorations. This perceived formality required them, for example, to think more about what they wanted to say before un-muting to say it, and overall, have a more fixed structure of activities compared to in-person zikr. This suggests design opportunities for supporting more fluid, less formal ways of interacting during remote participation in spiritual rituals.

*Online rituals continue for "leaving no one behind".* Similar to Claisse and Durrant, we found that online participation was important for "leaving no one behind" [22, Sec. 4.4.2]. Even P8, a Sufi teacher who emphasized that he believed that doing zikr online could not be as effective as in-person, explained that he continued offering hybrid zikr post-pandemic because he wanted to continue to include geographically distant participants. In contrast to prior work [22] and P8's expressed concerns about community engagement being reduced online, Noura recalls moments when participants really opened up online. During chit chat on Zoom before or after zikr, online participants sometimes talked in detail about their current life challenges, receiving supportive listening and advice from others. Other fields of HCI investigate the richness of online communities

(e.g., [51]). As shown in our study, the persistence of remote and hybrid participation calls for further work at the intersection of online communities and techno-spirituality.

## 6.2 Practical technical and design opportunities for a smoother ritual experience

Our findings detail entanglements of sensory, social, and spiritual experiences in zikr. Building on and going beyond prior work that also surfaces sensory, social, and spiritual experiences (e.g., [22, 33]), we outline specific, practical technical and design opportunities for remote technological mediations of spiritual chanting.

Our findings revealed the importance of audio synchronization. Similarly, work in virtual choirs and networked music show the importance and difficulty of synchronizing audio across multiple remote participants. With typical video call setups, signal latency prevents audio synchronization and is a serious disruption for real-time collaborative sound [4, 28, 62]. Similar to adaptations made for online zikr, choirs have found ways to accommodate remote participation by requiring remote singers to mute themselves on a video call, so singers only hear themselves and the conductor [28, 62]. While hybrid or remote participation is similarly valued as a way to sustain community and inclusion despite circumstances, the drawbacks are widely recognized. Some software innovations such as JackTrip - WebRTC have tackled this problem and significantly reduced audio latency [2, 58]. Yet, there is still more work to be done to make these technologies more widely approachable for practitioners whose main focus is on leading or participating in zikr.

Our discussion highlights audio considerations that emerged as significant for the experience of remote zikr. We do not claim that these are novel audio issues—to the contrary, our insights are infomed by prior work in virtual choirs and networked music on similar issues. Rather, as designers we highlight these audio issues as important considerations *for this context.* Through this, we point to design opportunities leveraging existing web audio techniques to support experiences of remote zikr and potentially other forms of remote chanting ritual practices.

*Rethinking background noise.* We found that, based on our own duoethnographic experiences, the sound of many people chanting was often filtered out as 'background noise' by Zoom. Enabling Zoom's audio settings for 'musicians' and turning off background noise removal helped some zikr groups improve the audio experience. Yet, Zoom is not designed for this use case. In one example, it took one group a few months to figure out how to navigate Zoom's audio settings and make the appropriate adjustments, partly due to lack of familiarity with Zoom's settings and partly because, when leading or participating in zikr, digging into audio settings can be distracting and time-consuming. This suggests design opportunities to offer more appropriate default settings for collective chanting, perhaps teleconferencing software specific for collective chanting, or a more intuitive way of choosing the right audio settings for one's intended purpose.

*Mixing pre-recorded audio with live voice.* For a remote zikr, drawing from one example from our duoethnographic experiences, one Sufi teacher played a recording of a group zikr on a different device, allowing the sound to come out of that device's speakers and into his laptop's microphone. As he simultaneously chanted into the laptop's microphone, which was connected to the Zoom call, his voice blended with the recording of the group chanting for remote participants. Of course, this multi-device setup is really a physical way of achieving audio mixing, which unfortunately also hurts the sound quality. Software already exists to support this kind of audio mixing, which would enable better sound quality of the recording and adjusting its level in comparison to the leader's voice, but these systems can be too complicated for participants whose main focus is on leading and participating in zikr. Another opportunity could be providing access to the single audio recording to all participants and designing ways for that recording to synchronize with the sound being broadcast via Zoom. Again, this suggests design opportunities for more approachable, or more specifically tailored software and interactions.

*Audio latency reduction.* To avoid feedback and delays, all zikr participants on Zoom are muted except for the leader, based on many examples from our data and summarized in Setting (Sec. 4). This removes the auditory experience of shared chanting, significantly detracting from the experience of shared spiritual energy (Sec. 5.1, 5.3). Past work on remote real time music collaboration tools such as Audiomovers [1], JackTrip [2, 58], and Jamulus [3] reduce audio latency in real time collaboration for playing music, but again these systems may be too complex for this context. If chanting's temporal demands are slightly less precise than that of music-making, this points to opportunities for bringing back the collective auditory experience of chanting online.

*Further auditory possibilities.* We suggest further opportunities for existing audio technologies to support a better experience of collective chanting remotely. While these audio techniques already exist, what we offer here are ways that existing audio techniques could be leveraged for this particular design context. For example, binaural sound and mixing could simulate how in-person zikr participants sit in a circle. Taking an impulse response recording in the room where the gathering usually happens could then be used for convolution reverb to make people's voices sound like they are in the space. These design ideas respond to, for example, P1 describing the importance of being able to hear one another's voices while sitting in a circle next to one another (Sec. 5.2). Additional cues of the live, embodied, real-time presence of others could be conveyed by unobtrusively miking and subtly mixing in other sounds such as breathing or the rustling of movements as people might sway back and forth during zikr. As a more technically complex idea, since many zikr groups follow the same set of chants every time, there could be further possibilities in using speech recognition trained on a group's specific chants to adaptively adjust the timings of audio segments from recordings, leader, and participants. Though many possibilities exist, we emphasize that all this must be done with great care, respect, subtlety, and restraint, to preserve the important qualities of liveness, collective intentionality, shared spiritual energy as well as the traditions of a particular community.

*Conveying visual presence.* Reflecting on how visual presence was important for some participants, we suggest possibilities for design. Some participants described referring to the camera views of the

leader and other participants as visual markers of presence and cues for transitions during zikr, while other participants preferred keeping camera off to focus on the auditory chanting. Further research could design for additional ways of conveying visual markers of presence and liveness, such as, visualization of sounds, movement, breath and other elements of subjective experience of each participant.

*A polite way to flag technical difficulties.* Sometimes the technology did not work as intended, but each remote participant wondered if it was only on their end, and was hesitant to interrupt the teacher leading the ritual. This could allow a technical issue to persist, such as the teacher accidentally being on mute, ruining the experience for everyone. Of course this issue can happen in other online meetings, but participants may be especially hesitant to speak up due to the particular spiritual importance of the ritual. We suggest that designing a customary way for an individual user to flag that they have noticed technical difficulties, and having a summary view of how many users have flagged technical difficulties, could provide an unobtrusive way to notice and address technical issues that could be affecting everyone, or offer back-channel assistance to particular participants.

### 6.3 Designing for 'sensational forms' and diverse ways of noticing, feeling, and knowing

While the previous subsection detailed specific 'implications for design', we take up Dourish's call for qualitative research in HCI to go beyond this limiting frame [27]. With this purpose, our final discussion subsection unpacks deeper ethical, embodied, and experiential reflections.

Cultural anthropologist Meyer uses the term *sensational forms* to describe religious practices, to help call attention to sensory and emotional ('sensational') as well as material ('form') aspects of religious practices and individual subjective experiences of these practices [46]. Meyer explains, "Sensational forms, in my understanding, are relatively fixed, authorized modes of invoking, and organizing access to the transcendental, thereby creating and sustaining links between religious practitioners in the context of particular religious organizations. Sensational forms are transmitted and shared, they involve religious practitioners in particular practices of worship and play a central role in forming religious subjects. Collective rituals are prime examples of sensational forms, in that they address and involve participants in a specific manner and induce particular feelings. But the notion of 'sensational form' can also be applied to the ways in which material religious objects—such as images, books, or buildings—address and involve beholders. Thus, reciting a holy book as the Quran, praying in front of an icon, or dancing around the manifestation of a spirit are also sensational forms through which religious practitioners are made to experience the presence and power of the transcendental" [46]. Meyer draws from her own anthropological research on sensational performances in Christian televangelism, but uses the lens of "sensational form" to attend to subjective experiences in terms of sensory and emotional feelings [46]. Approaching religious experience as always already mediated by technologies of various kinds, Meyer calls for further research on subjective perceived sensory experiences of religious technological mediations [46].

Our work offers one case study of engaging Meyer's call through design research: Our findings detailed sensory experiences of practitioners doing zikr, how these sensory experiences played an important role in the feeling of shared spiritual energy of zikr, and how remote and hybrid participation reshaped these experiences through technological mediation. As designers continue to investigate FRS in HCI, we suggest that the anthropological lens of 'sensational forms' can help attend to participants' sensory, emotional, and spiritual experiences, to help reimagine possibilities for technological mediation of religious experience.

Thinking through 'sensational forms' helps acknowledge the importance of sensory perceptions to spiritual or religious practices, and—taking this one step further to consider the longer-term aims of spiritual or religious practices—to cultivating personal moral or ethical sensibilities. This helps open avenues for researchers to continue exploring sensory, embodied experiences for techno-spirituality, through intersections with other approaches in design research. For example, design research could explore intersections of sensory techno-spirituality with *felt ethics* [30], attending to how somatic embodied experiences help cultivate and co-constitute ethical, moral sensibilities. Furthermore, reflecting on how zikr's aims of setting aside one's own ego, we suggest potential for designs exploring meditation alongside Biggs et al.'s work on abjection and "decentering the human" in ecological, posthuman design [11]; different traditions of thought could offer different framings and approaches to how one's sense of self/other/environment divisions could be blurred, merged, or temporarily lost. Drawing on *arts of noticing* [64], recent design and HCI research explores cultivating ethical sensibilities in more-than-human relations [41, 42, 56] and resisting inequalities of capitalist technological innovation through 'noticing differently' [40]. We suggest opportunities to explore the intersection of *arts of noticing*, attunement, and cultivating felt sensibilities, with the kinds of attunement and noticing practices that can occur during spiritual rituals and between them. More broadly, we echo Naqshbandi, Mah, and Ahmadpour [49] and [47] in calling for greater recognition of participants' FRS-related experiences, in ways that support diversity, intersectionality, and design justice [24].

## 7 LIMITATIONS AND FUTURE WORK

We conducted recruitment and interviews in English, which is limiting especially considering Sufism's roots in Arabic, Persian, and other languages. We conducted all the interviews on Zoom, asking participants to remember their experiences participating in zikr. Future work could employ methods such as micro-phenomenological interviewing techniques (e.g., as already taken up in interaction design for musical expression [52]) to help articulate participants' experiences in more detail. We were able to interview participants in multiple Sufi groups to investigate a range of practices and experiences. Yet, the reach of this study is limited, and our findings should not be taken as in any way 'representative' of Sufism more broadly. Future work could explore how HCI can support many varied spiritual practices of different Sufi lineages, and is likely to surface many different possibilities.

We also sometimes put our discussion in close conversation and comparison with prior work (especially Claisse and Durrant [22]) because similarities in method and setting help clarify and situate the insights from our study. Yet, it is important to avoid over-generalizing across decidedly distinct traditions engaged in prior work, such as Buddhism [22], Judaism [33], or even the various traditions within Islam. In engaging diverse contexts, design research should approach each setting with respectful sensitivity to participants. In diversifying HCI beyond both its secularized and implicitly Christian paradigms [34, 54], many case studies of distinct spiritual practices are needed.

Future work could also explore design opportunities drawing from HCI's past work supporting focus, attention, and web audio multi-user synchronization.

# 8 CONCLUSION

In this paper, we conducted a qualitative study of Sufi communities and their use of remote participation in ritual practice. In our findings, we articulated how remote participation impacts, but not necessarily diminishes, the practitioners' experience of "spiritual energy" as well as the role of sensory experience in this techno-spiritual practice. Furthermore, we showed that remote participation can enhance and enrich the sense of community by fostering a range of intentionalities among practitioners. Finally, we contributed practical design considerations and explored possible design directions. Our work contributes to the growing HCI scholarship in FRS by honing in on a particular set of techno-spiritual practices from an Islamic Sufi perspective.

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