

Attention Nooks: Situated Frictions to Foster Intentional Technology Use

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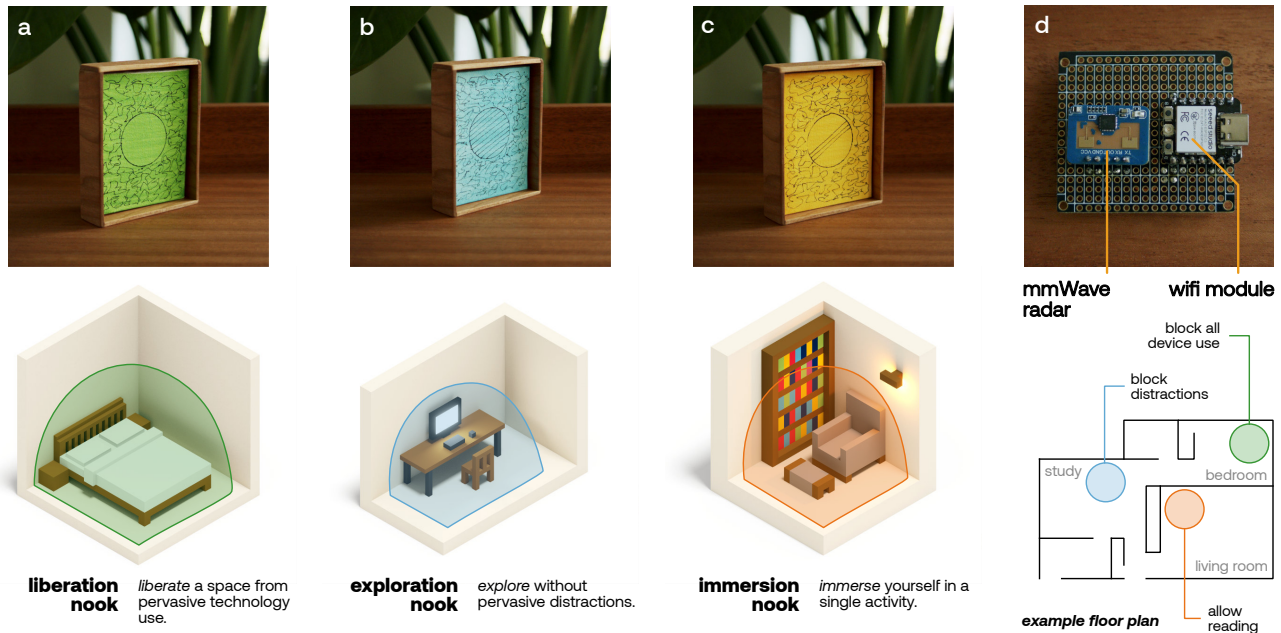


Figure 1: ATTENTION NOOKS; (a) – (c) The three kinds of NOOKS we discovered during our inquiry along with the sensor used to denote a NOOK; (d) *Top*: The components of the sensor; *Bottom*: An example floor plan deploying different NOOKS in the home.

Abstract

As persuasive technologies weave themselves deeper into the fabric of domestic life, the challenge of sustaining digital wellbeing grows increasingly entangled with the spaces and rhythms of everyday living. Conventional Digital Self-Control Tools (DSCTs), while offering momentary reprieve, often falter under sustained use, revealing a gap between device-centric interventions and the situated nature of technology habits. In resistance, we present Attention Nooks: a set of spatial interventions that deploy "situated frictions" within the home. Attention Nooks recast digital wellbeing as a lived negotiation of spatial boundaries in the home. Developed through an autobiographical design process, we surface design events that shaped our making and living with our prototypes. We discuss the teleological nature of interventions, implications for

ubiquitous computing, and the subversion of ethically ambiguous technologies. Our contribution lies in reframing digital wellbeing as a design opportunity that calls for pluralistic situated encounters in the home.

CCS Concepts

• **Human-centered computing** → **Interactive systems and tools**; *Ubiquitous and mobile computing systems and tools*; Mixed / augmented reality; **HCI theory, concepts and models**.

Keywords

digital wellbeing, frictions, wellbeing, indoor localization, mmwave presence detection, situated frictions



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1 Introduction

“The promise of the information age was unparalleled access to every single last bit of human knowledge at every moment, and the reality is a collective civic mental life that permanently teeters on the edge of madness.” - *Chris Hayes, The Siren’s Call*

Pervasive and ubiquitous technology was proposed and accepted as widely beneficial to humankind, promising a future where using technology feels like a “walk in the woods” [103]. When access to information was still mired with scarcity, pushing towards ubiquitous anytime/anywhere access [3] was admirable. We are now witnessing the leaks in this vision as *persuasive* technologies have *pervaded* all possible aspects of personal and social life. The default model of digital capitalism [94], relying on “harvesting human experience” to sell it to the highest bidder [111], is badgering the quality of life across the world [75, 76] and continues to undermine the institutions [102] that we’ve built to support and enhance them. Somewhat ironically, the rise of “social media” and the constant connectivity that they promise has contributed to a growing loneliness epidemic [58, 108], as genuine human connections are often supplanted by virtual interactions. While their utility is unquestionable, we have found that they are markedly inferior even in the worst of times, such as the Covid-19 pandemic [59]. Moreover, the decline of ‘third places’ [21] has left individuals even more isolated, with homes becoming the primary venue for absurd amounts of seemingly endless digital consumption, while capitalist platforms with unchecked monopolistic behavior increasingly encroach our private spaces [14].

In response to this pervasive issue, an ongoing counterculture attempts to prescribe both individual [47, 71] and institutional [18] solutions. However, people are most often asked to rely on self-control to resist the endless onslaught of pervasive technology use. Self-control is not only difficult, it might even be impossible as problematic smartphone use in fact *leads* to self-control deficits [19] and is not a result of them. What’s worse is that individuals tend to blame themselves for their self-control failures [110] rather than externalize blame on the exploitative attention capture mechanisms [66] deployed by the worst offenders of the attention economy. When individuals *do* exercise their agency to try and regain control over their humanity, Digital Self-Control Tools (DSCTs) [87] are often the first attempt at defense, introducing a layer of friction between them and the platforms. While DSCTs can be initially helpful, they suffer from high attrition rates [44] and are probably ineffective in the long term [65]. Finding the right amount of friction [56] to overcome problematic technology use can be challenging as new habits are inevitably formed, circumventing the deployed intervention and rendering it practically ineffective [65].

In our work, we build on empirical positivist interventions [34, 41–43, 52, 57] that support digital wellbeing along with speculative designs that explore alternate encounters between people and digitality in the home [16, 89, 90]. ATTENTION NOOKS aims to provide an empowering tool for home-dwellers to negotiate and reclaim the spaces that have been heavily encroached by pervasive technology use. We investigate how rooting frictions for digital wellbeing in specific ‘situations’ – or spatial zones in the home – can play a role in supporting intentional technology use. Through our design

process, we discovered three distinct nooks with different attentional roles: *Liberation Nook*, *Exploration Nook* & *Immersion Nook*. With our design, we hope to support a transition towards homes where interventions for digital wellbeing are not just rooted in the very devices that initiate, provide and sustain stimulation, but instead, provide a way to “reposition it as something that is lived, situated, and contextual, making designs that are closer to the entangled phenomena of being in the world” [89].

Methodologically, we are committed to Research-through-Design (RtD) [24, 109]. We use a combination of autobiographical design [15, 70] and critical making [84], where the process of creating and interacting with our designs becomes a deeply personal exploration that blends practice with reflection. Drawing inspiration from design practices, theoretical insights from Science and Technology Studies (STS) scholars, philosophers, and critiques by media studies, we document this journey with a focus on the ‘genuine need’ [15, 70] aspect of autobiographical design while maintaining a critical lens on not just pervasive technology, but also our design. While digital wellbeing is often framed as an issue necessitating controlled interventions, we aim to add to the discourse treating digital wellbeing as a dynamic construct [99] and to persuade readers that empowering tools are not just necessary, but are also effective in creating and sustaining a digital wellbeing practice. As Mike Monteiro provokes [67], “*designers ruined the world*” and it is our responsibility to try and fix it. Our hope is that intentional designs that embrace the nuanced reality of co-existing with pervasive technology can better support digital wellbeing. RtD, autobiographical design and critical making help us document and disseminate our making and interactions with ATTENTION NOOKS, and we hope to offer directions that are not merely prescriptive but are sympathetic to the intricate dynamics of modern digital life.

Our contributions include: (1) ATTENTION NOOKS, and the concept of ‘situated frictions’ in the home to support intentional technology use in particular spaces; (2) design events [77] that led to the development of *Liberation Nook*, *Exploration Nook* & *Immersion Nook*, highlighting the intricate dynamics of making and living with ATTENTION NOOKS in a way that accommodates different attentional modes; (3) a deployable instantiation of ATTENTION NOOKS built using open-source platforms and (4) a broad discussion around the complexities of supporting the messiness of developing systems that support digital wellbeing, the socio-politics of the domestication of technology, as well as reflections on living with ATTENTION NOOKS.

2 Background

2.1 The Perils of Pervasive and Persuasive Technology Use

The promise of unlimited information access through smartphones and ubiquitous internet connectivity is unquestionably seductive: knowledge barriers dissolve, creativity flourishes, and new forms of connection emerge, all while contributing to improved economic outcomes [2]. Smartphones, by design, render information placeless, spaceless, and formless [72], enabling access to unimaginable amounts of digital content in a device that can be carried anywhere/anytime. Yet, as with nutrition, access to abundance produces its own pathologies. Starvation and obesity can coexist in

a world capable of producing sufficient food [79] to feed all earth-dwellers. The very mechanisms that make information universally accessible also make compulsive use inevitable. While the Covid-19 pandemic briefly muted conversations about digital wellbeing as connectivity became survival infrastructure, the evidence is now overwhelming and unavoidable: smartphone addiction has risen dramatically across the world [69, 75], with extensive documentation and discourse over the perils of technology overuse [30]. This addiction manifests not as an abstract concern, but in the concrete sites where people live, work, and move through their daily lives.

These sites of addiction span the full geography of daily life. In the workplace, where knowledge work is inseparable from internet use, discussions center on minimizing distractions [8, 61] due to the inherent capitalist benefit of increasing worker productivity and efficiency. On the road, distracted driving poses acute dangers during commutes [107], while smartphone use in public spaces carries documented social and psychological costs [81]. Schools worldwide have responded by instituting restrictions to protect students from device-induced distractions during the school day [6]. Yet with the rapid decline of third places [21], it is in the *home* where these consequences are perhaps most deeply felt. The mere presence of a smartphone diminishes opportunities for social connection [98] and reduces cognitive capacity [101], yet devices routinely occupy dinner tables [13, 35], beds [22, 37], and even bathrooms [74]; information is *truly* placeless [72]. The persistence of such practices is reinforced by design mechanisms explicitly engineered to capture and hold attention [66], systematically eroding user agency [53].

ATTENTION NOOKS seeks to address the consequences of allowing persuasive technology to pervade every aspect of home life by refusing to treat all sites in the home as a canvas for digital consumption. This erosion of agency in the home raises a fundamental question: how does technology come to be accepted and domesticated within domestic spaces in the first place? Understanding the processes by which digital technologies enter, settle, and reshape the home is crucial for imagining alternatives that resist the totalizing pull of persuasive design.

2.2 Domestication of Technology

Any introduction of digital technology into a domestic space invokes the notion of a “smart home,” yet what it means for a home to be “smart” requires careful consideration. Gram-Hanssen et al. [27] condense the idea of a smart home into “a place for *security and control*, for *activity*, for *relationships and continuity*, and for *identity and values*,” a definition that clearly aligns with fundamental human needs. Despite this alignment, adoption of smart home technologies [36, 48] continues to face significant challenges. People approach these technologies with distrust and resistance, while concerns about financial costs, privacy, security, and technology anxiety cast long shadows [48]. The process of domesticating technology into the rhythms of home life proves difficult, sometimes even destructive [48], while the landscape remains fragmented by missing standards, proprietary platforms that lock users into walled gardens, and a dearth of compelling applications beyond simply adding internet connectivity to everyday objects [36, 48]. STS scholarship reveals the home as anything but a passive backdrop where technologies are simply adopted. Rather, it is a contested site

where processes of technological domestication actively unfold [26]. Home devices and platforms do not arrive in the household as “inert tools” but actively reconfigure family dynamics and the rhythms of everyday life in what Goulden et al. characterize as an “act of colonization” [26]. Even within a single site, notions of who installs, maintains, and controls smart technology are heavily gendered and remain patriarchal [86]. When technologies span multiple sites, as Johannessen et al. [39] explore through the concept of “multi-site domestication,” the neat abstractions that might guide design for a single location quickly dissolve [36]. When capitalist platforms are involved, the stakes multiply: embedding technology in domestic settings risks not only capturing user’s attention but also results in “cognitive lock-in,” where platforms cultivate computational dependencies between technology and the individual [31]. In such settings, attention itself becomes a commodity, flowing from one focal object to another as platforms orchestrate its movement [32]. The domestication process thus transforms the home into a site where attention is extracted, dependencies are cultivated, and the rhythms of life are reconfigured to serve platform logics, making the simple act of bringing technology into the home anything but simple.

This transformation exemplifies Borgmann’s device paradigm [5], which cautions that modern technologies often supplant meaningful, skillful, and engaged practices with devices engineered for perpetual ease and instant gratification, thereby diminishing opportunities for significance and engagement. Smartphones and laptops epitomize this paradigm: they serve as ever-present gateways to stimulation, eclipsing dinner conversations, bedtime rituals, and the rhythms of everyday domestic life through seamless access to distraction. In contrast, Bachelard’s *Poetics of Space* [4] frames the home as a constellation of intimate nooks and corners that nurture reflection, imagination, and connection. Massey [64] eloquently observes that “if time is the dimension of change, then space is the dimension of the social,” situating the home as a container for sociality and refuge.

Yet, the contemporary spread of smartphones fragments this architecture of intimacy, reducing the home’s capacity to shelter its inhabitants from external stimulation and commercial pressures. Together, the perspectives of Borgmann, Bachelard, and Massey reveal how devices subtly embed themselves into everyday life, presenting as indispensable infrastructure while gradually eroding the focal points of attention and meaning within domestic rhythms. While early efforts such as Weiser’s Calm Technology [104] and Tolmie’s Unremarkable Computing [97] offer counterpoints, proposing designs that recede into the background or support everyday routines, these approaches tend to default to temporal logics, privileging schedules and device clocks over the nuanced spatialities of the home.

Consequently, in much the same way as the Amazon Dash button [20] exemplifies frictionless consumption, the prevailing trajectory in consumer domestic technology is to facilitate ease and impulsivity, often at the expense of attentional depth and intentional experience. At its root, this trend highlights the pervasive influence of consumer-capitalism in shaping device design, steering it toward maximizing engagement and consumption rather than supporting meaningful domestic life. ATTENTION NOOKS can be read as adversarial design [17], that accounts for the over-bearing

nature of the smartphone and the laptop, while carving out focal zones in the domestic sphere to meaningfully *adjust* consumption.

2.3 Existing Frictions to Support Intentional Use

In order to meaningfully adjust consumption in a way that supports user agency while engaging with technology [56], researchers and industry alike have developed a wide range of Digital Self-Control Tools [87]. Among these, our work aligns most closely with *frictions* or *seams* [9] that restrict access to problematic platforms under certain conditions. *Temporal Frictions* are the most common, allowing users to set time limits or block access during specified hours [11, 33, 34, 40, 43, 49, 91]. While effective in some contexts, they reduce the fluidity of daily life into a calendar, assuming repetitive rhythms and overlooking the variability of weekends, holidays, or social events. *Frequency Frictions*, which cap the number of times a platform can be accessed [45, 82], similarly collapse the multiplicity of experience into a single quantity, still reliant on temporality. *Intent-based Frictions* attempt a more nuanced approach: some use machine learning to automatically predict problematic smartphone usage [92], introduce a delay before launching an app [44], ask users to choose between “explore” and “focus” modes [52], or even deploy Large Language Models to chat with users about their goals [78, 106]. Other inventive designs include hacking touch input to disrupt seamless interaction [51] or printing “receipts” for material reflection [90]. Across these examples, most frictions aim to provoke the question “*why now?*” before engaging with a problematic platform.

Yet, these frictions primarily address the ‘anytime’ dimension of ‘anytime/anywhere’, leaving the ‘anywhere’ part largely unexamined. Scrolling on the commute home at 10 p.m. differs profoundly from scrolling in bed at the same hour. A few interventions acknowledge this, such as location-based restrictions in the classroom to improve the quality of engagement [40] and the growing shift towards disallowing smartphones from schools [6] and live shows [68]. Although spatial interventions remain uncommon, some research has explored leveraging proximity [28] to adapt interfaces based on a user’s physical relationship with devices and others in their environment, considering both attention and spatial context. However, much of the discourse around the ubiquitous computing angle [103] revolves around productivity or privacy which tended to be the matters that needed most attention at the time. For instance, Marquardt et al. while referring to interfaces that are designed to “support users’ attentional capacities”, goes onto talk about a system that “pauses video playback” when the user turns away from it [62]. This highlights the heavily progressional viewpoints of proxemic interactions that did and will exist to *reduce* the friction to consume. Perhaps closest in spirit to our work is Pierce et al.’s design proposal [80] for a wireless “de-router” that proposes a digital Faraday cage blocking wireless signals in an area and the Brick device [1] that locks and unlocks apps using a tangible key.

While proxemic and embodied interactions tend towards effectively supporting but inevitably *holding* the users’ attention when they’re within proximity of the device, ATTENTION NOOKS extend and subvert this trajectory by treating proximity to a *situation* within the home as an important aspect of digital wellbeing. We

establish seamless (in relation to the space) domestic zones such as device-free beds or desks configured for focused work, where access to platforms is selectively restricted. Grounding interventions in these narrow domestic spaces, or *nooks*, can afford a richer, more *situated* reconfiguration of relationships with personal devices. The social dynamics of space add additional frictions to the adoption of such technologies in the home, and while ATTENTION NOOKS fits within the confines of a “smart home,” our work is more spiritually aligned with conceptions of smart homes that treat the “people who imbue their homes with intelligence by continually weaving together things in their physical worlds with their everyday routines and distinct social arrangements” [95]. Instead of treating users as passive entities that “invite” the technology into their homes and accept it as it is, we aim to actively reframe “tinkering” with the smart home by transitioning it from an activity that barely replaces the existing functionality of a light switch, for instance, to an act of practice and craft that aims to support digital wellbeing as a “dynamic construct” [99]. To extend our contribution and support ethical adoption, we rely on open-source, community supported home automation systems and off-the-shelf sensors that prevent vendor lock-in [36].

As we continue to see improved adoption for smart devices in the physical wellbeing space [36], our hope is to encourage home-dwellers to consider digital wellbeing as a need that can be addressed by systems such as ours. Instead of hyper-focusing on the ebb and flow of electrical energy through the home, perhaps we can re-orient this conversation towards considering and conserving the energies of the home-dwellers in ways that protect us from the onslaught of platform capitalism.

3 Methodological Approach

To pursue this inquiry, we draw on Research through Design (RtD) [109], discursive design [96], adversarial design [17], critical making [84], and autobiographical design [70]. Much of HCI’s progressional and empirical subfields treat digital wellbeing as a problem best addressed through controlled interventions that test the efficacy and effectiveness of specific techniques. While valuable, this approach often presumes a stable notion of what it means to be “well.” We instead treat digital wellbeing as a wicked problem [50] that resists closure and evolves alongside the shifting logics of the attention economy. We take inspiration from Oogjes and Wakkary’s notion of design events [77], attending to how moments of breakdown and adaptation generate design knowledge. Given the privacy-invading nature of digital wellbeing systems, the logistical barriers of long-term hardware deployments, and the wickedness of digital wellbeing, autobiographical design and critical making are especially well-suited to this inquiry. It allows for “genuine needs, real systems, fast tinkering, record keeping and long-term usage” [15, 70] along with a critical reflection of the technology’s role in subserving or subverting normative progressional tendencies. Living with the system also allows us to meaningfully engage with the frictions that it produces along with the ethical quandaries [23] that are often sidelined in the pursuit of “significant results”. A further contribution of design research lies in producing boundary objects that embody ideas in ways that are communicable to diverse audiences. Addressing digital wellbeing demands collective action,

reflection, and organizing. By foregrounding experiential accounts of living with ATTENTION NOOKS, we aim to provoke reflection and conversation that may open pathways toward collective action.

Finally, autobiographical design provides a means to “scratch our own itch,” enabling fast tinkering and experimentation with richer, more nuanced designs even when they are not practical in conventional terms. Unlike controlled interventions that often require paring systems down for long-term stability and study robustness, autobiographical design allows for genuine engagement with the complexities of domesticating an intervention. We believe that the methods we used in designing ATTENTION NOOKS are closely aligned with how we envision home-dwellers tinkering with and engaging with situated frictions.

3.1 Author Background and Project Context

The first author (Anup Sathya) is a PhD student at the University of Chicago. Anup has primarily lived in shared accommodations throughout his life. Between 2023 and 2025, he faced significant challenges with a roommate, resulting in most of his non-working hours being spent, confined to his bedroom. In this constrained environment, his laptop became central to nearly all aspects of daily life, serving as a hub for work, entertainment, social interaction, and learning. As an international student navigating a long-distance relationship, Anup grew increasingly dependent on his laptop for communication and shared activities like movie and TV sessions, further dissolving boundaries between the different facets of his life. Although occasional social opportunities outside the home provided some relief, Anup grappled with disrupted sleep and, over time, developed symptoms of depression.

In late 2024, Anup reflected on his early encounters with technology, recalling how, as a child, he would secretly spend hours on the family computer that he was not permitted to use freely. Situated in the corner of the living room, the computer acted as a fixed portal: to access it, Anup had to physically position himself before its screen, consciously entering a threshold between his domestic world and the expansive digital realm beyond. As technology became increasingly pervasive, the freedom to access digital spaces through portable devices also brought unintended consequences: laptop use gradually extended into every facet of daily life. Although problematic smartphone use is widely recognized, Anup’s early understanding of the attention economy and the manipulative design of social media [66] prompted him to delete his accounts and intentionally curtail smartphone capabilities. Consequently, attention concerns shifted primarily to the laptop, making it the central focus of the interventions explored in this work. While the interventions we deployed are centered around the laptop, the underlying experiences are transferable to smartphones using simple tools such as Apple’s Shortcuts SDK as demonstrated by Purohit et al [83]. Moreover, working with the laptop foregrounded the complexities of designing effective frictions on devices where work and leisure are tightly entangled, particularly in academia.

Unlike conventional RtD processes that often begin with ideation, the development of ATTENTION NOOKS demanded a techno-centric approach at the outset. Building an intervention that the author could meaningfully live with required direct experimentation with technical possibilities until a viable prototype emerged. Anup’s

background in Electronics and Computer Science was instrumental at this stage. Once a usable prototype was in place, the focus shifted to designing interventions, engaging in meaning-making, reflecting on the lived experience of ATTENTION NOOKS, and shaping the boundary object. During this period, Anup transitioned to living in a single-occupant apartment, which significantly simplified the technological requirements for implementing ATTENTION NOOKS. In a shared apartment, supporting situated frictions would have necessitated the use of more complex sensors and stricter systems to prevent false positives. These constraints would have made it significantly difficult to move beyond building a basic, usable system and toward sustained tinkering with the frictions themselves, which was the central aim of our design process. As explored further in Section 5.1, Anup invested substantial effort experimenting with Ultra Wide Band (UWB) technology to develop a device-tracking system that could enable ATTENTION NOOKS for multiple inhabitants. However, the move to a single-occupant dwelling allowed for a shift in focus from solving hard technical challenges toward richer exploration of the interactions between frictions and daily routines.

The design events described in this paper span from late 2024 to late 2025, unfolding alongside the evolving rhythms of daily life and habits. Making and living with interventions proved to be an ongoing, non-linear process deeply entangled with patterns of routine and the gradual formation (and reformation) of habits. While intervention efforts necessarily tend toward specific, actionable goals, this teleological impulse often stands in tension with the open-ended, exploratory nature of Research through Design (RtD). We chose to conclude our process when the trajectory of design iterations began to drift away from our central research questions, indicating a natural boundary to this inquiry’s scope.

We also recognize that these experiences and opportunities were shaped by broader social dynamics. In particular, in spite of growing up in the so-called “global south”, Anup’s masculine presentation afforded him early and ongoing access to computers and technology. This privilege is not universally available. The practice of tinkering, and the wider domain of digital housekeeping [86], are deeply conditioned by gendered norms and expectations. Anup makes a consistent effort to maintain awareness of these dynamics by critically engaging with how patriarchal infrastructures and technological visions often suppress more convivial and inclusive alternatives (drawing on Illich’s notion of conviviality [38]). Although critical engagement with gendered technological practices and feminist HCI methods forms a foundational aspect of Anup’s axiology¹, we acknowledge that the explicit articulation of gendered dimensions in this paper was prompted by reviewer feedback. We recognize and regret this initial lack of reflexivity and are committed to more proactively foregrounding these perspectives going forward. We further expand on these considerations in Section 6.5.

3.2 Documenting the Process

Comprehensive documentation and record keeping are foundational to RtD; in autobiographical design, these practices serve a further purpose, prompting reflection and revealing insights that

¹Here, axiology refers to Anup’s morals, values, and ethics as discussed by Shawn Wilson [105]

might otherwise remain unspoken. For Anup, this process involved maintaining weekly reflections that recorded his patterns of laptop use across different spaces in the home. The primary aim was not to establish the efficacy of each intervention, but rather to cultivate a deeper understanding of what it is like to live with such interventions in practice.

The frictions Anup embedded into his laptop use were intentionally flexible, not fixed constraints. There were occasions when he needed to disable or override them to complete urgent work, maintain connections with family abroad, or respond to creative urges. Instead of viewing these interruptions as setbacks, Anup treated them as instructive disruptions. Each override illuminated particular needs, vulnerabilities, or priorities that the design could not fully foresee. These moments highlight meta-frictions that surround the design of frictions themselves. By journaling at these moments, he recorded not just the rationale behind his choices, but also the involved emotional and practical negotiations. These episodes often proved to be the most generative phases of the design process, highlighting how interventions for digital wellbeing are not simply followed or abandoned, but are actively negotiated, adapted, and reimaged over time.

3.3 Ethical Considerations

To examine the lived experience of co-existing with situated frictions, Anup collected private data that shifted in scope over the course of the RtD process. Before implementing the frictions, he mapped laptop usage hotspots in the apartment using a decade counter. Past this stage, he deployed sensors to detect device usage in certain spaces. During sensor calibration, he focused on presence data to tune the sensitivity to avoid false-positives and false-negatives. Once stabilized, data collection returned to usage hotspots in the home, accompanied by reflections on whether specific practices warranted intervention. This adaptability highlights a strength of autobiographical design: the capacity to reshape data collection and reflection in ways that would be ethically and practically difficult in participant-based studies.

Anup's motivations were layered. Personally, he sought healthier digital habits; professionally, he aimed to contribute to speculative visions of technology use with clearer boundaries, while advancing academic and career goals [15]. Autobiographical design blurred distinctions between life and work, a tension he managed with ongoing access to mental healthcare, including weekly therapy sessions where the personal impact of the process could be addressed.

3.4 Analysis

Especially considering the autobiographical nature of our work, we rely on reflexive thematic analysis (RTA) as outlined by Braun and Clarke [7]. RTA emphasizes the researcher's active role in generating, rather than merely uncovering, themes, making it well-suited for an autobiographical design process. The corpus included weekly reflections, override journals, sensor data, usage logs, sketches, photos of spatial configurations, and notes from design explorations. These materials documented not only technical iterations of ATTENTION NOOKS but also the lived negotiations of co-existing with situated frictions.

The analytic process involved reflexive iterative engagement with this corpus, guided by questions such as: How did the situated frictions reshape Anup's relationship to the laptop and his home? What negotiations and tensions arose in daily use? And what forms of boundary-making did these interventions make possible? We began with open coding to surface experiential and technical insights, followed by axial coding to trace connections across them. Importantly, analysis was not a detached procedure but a reflexive practice: Anup's interpretations were inseparable from his positionality as both designer, engineer, and participant. In the sections that follow, we present the different nooks, the design and psychological rationales that informed them, and the insights developed through the lived process of inhabiting and reflecting on ATTENTION NOOKS.

4 Attention Nooks

We define ATTENTION NOOKS as spatial interventions that introduce purposefully situated frictions in domestic spaces that attract passive or compulsive digital consumption. By establishing these hyper-localized frictions, ATTENTION NOOKS support more mindful, intentional negotiation of when and how devices are used within particular nooks and corners of the home. Crucially, ATTENTION NOOKS are not prescriptive solutions but intentionally flexible frameworks meant to be adapted and reconfigured by home-dwellers according to their own evolving needs, routines, and values.

In this section, we present three distinct nooks that organically arose from Anup's lived experience with ATTENTION NOOKS. Each supports a different mode of attention, reflecting how Anup navigated daily life. While the underlying technical approach remains consistent across these examples. Our intention is not to offer an exhaustive taxonomy, but to illustrate how such nooks can emerge in response to individual domestic rhythms. We hope these examples will serve as inspiration or practical starting points for home-dwellers, designers, and researchers exploring more situated and intentional modes of technology use in the home.

4.1 Liberation Nook

The concept of a *Liberation Nook* is envisioned as a sanctuary of freedom, where digital device usage is entirely restricted, fostering an environment of uninterrupted presence and introspection. This nook serves as a personal refuge, enabling the reclamation of mental and emotional presence, free from the disturbances of notifications, algorithmically curated feeds, or the urge to check emails one last time. By establishing a definitive boundary on device usage, the space is "liberated" from the grasp of the attention economy. For example, the bedroom emerges as an optimal candidate for a *Liberation Nook*, as research indicates that sleep quality significantly improves when smartphones are excluded from this space [22, 37]. Additionally, a *Liberation Nook* can be envisioned in communal areas, such as the dining table, a card/board game table or in creative environments, like an art studio, where undistracted presence is paramount. This concept echoes existing anecdotal practices, such as placing all phones in a bowl or securing them in a lock box during dinner.

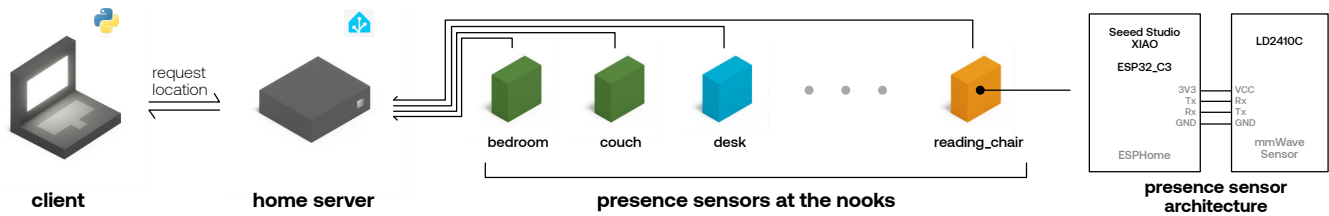


Figure 2: Full flow chart for our instantiation of ATTENTION NOOKS. The client, in this case a MacBook Pro running a Python script as a persistent system service, sends an API request to a home server running Home Assistant. Home Assistant determines presence using the sensors in the home. The presence sensor is built using an ESP32C3 and an LD2410C mmWave radar. Different architectures may be used to detect presence based on the requirements of the home.

4.2 Exploration Nook

The *Exploration Nook* is designed as a zone that supports practices of internal attention [10], where focus depends not on uninterrupted absorption but on the purposeful orchestration of multiple sources, tools, and ideas. Many forms of knowledge work and learning demand this kind of attentional flexibility: toggling between reference materials, drafting text, cross-checking data, or assembling disparate inputs into a coherent whole. Rather than treating such movement as distraction, the *Exploration Nook* acknowledges it as essential to exploratory and generative work.

In this mode, design plays a curatorial role. By restricting access to platforms like Instagram or Reddit, which are optimized for attention capture, it preserves cognitive bandwidth for intentional switching while preventing drift into unrelated or compulsive activity. In Anup’s case, the desk emerged as the prime location for an *Exploration Nook*, serving as a site where disciplined interleaving [25] could occur without the risk of collapse into endless scrolling. Other possible settings include home offices, libraries, or study corners where focus is sustained not through exclusion of all input, but through careful channeling of attentional resources toward a task at hand.

4.3 Immersion Nook

The *Immersion Nook* is designed to sustain practices of external attention [10], where focus is anchored to a stable sensory stream such as text on a page, the sound of an instrument, or the rhythm of a physical task. Unlike blanket blocking, the *Immersion Nook* operates through an allowlist: only the tools essential to the activity are accessible, while all others are restricted. This selective narrowing protects fragile states of uninterrupted absorption often described as vigilance [73] or flow [12] from being broken by irrelevant inputs.

In Anup’s case, the reading nook exemplifies this mode: only the Books app was permitted, while any attempt to stray beyond it resulted in the screen dimming to black, gently nudging attention back to the text. Similarly, at a piano bench, access might be limited to a metronome app, supporting musical practice without intrusion. By foregrounding the activity and filtering out everything else, the *Immersion Nook* creates a cultivated environment where immersion can take hold. This approach resonates with strategies like single-purpose devices (e.g., typewriters or e-readers) that deliberately constrain possibility in order to protect attentional depth.

4.4 How Do They Work?

Shaping the relationship between space and device use can be achieved through multiple technological approaches. High-resolution indoor localization, such as Real-Time Locating Systems (RTLS), can track people or devices within the home, each with unique trade-offs. In our work, the specific localization technology is secondary; our focus is on the lived experience of interacting with the system and how it evolves over time.

Our implementation of ATTENTION NOOKS relies on simple presence detection. We distinguish between two forms of presence: dynamic presence (e.g., bodily movement) and static presence (e.g., prolonged sitting). While dynamic presence can be reliably detected with a standard Passive Infrared (PIR) sensor, problematic device use is more often associated with static presence, such as extended periods of sitting at a desk or on a couch [54]. In our initial explorations, PIR sensors produced a high rate of false negatives when detecting static presence. To address this, we employed millimeter-wave (mmWave) radar sensors capable of detecting micro-movements such as breathing. Although mmWave sensing can enable highly sophisticated activity recognition [93], we use it here solely for static presence detection. While fusing PIR and mmWave can increase accuracy, our tests with an off-the-shelf system that combined both modalities² demonstrated that the marginal accuracy gains did not justify the significantly higher cost, especially in our context.

The presence sensor is connected to *Home Assistant*³ – an open-source home automation platform – via a Seede Studio XIAO ESP32C3⁴ running *ESPHome*⁵. We selected Home Assistant both for its widespread adoption and for its alignment with our values: it does not monetize user data and avoids locking users into proprietary ecosystems.

Home Assistant exposes RESTful API endpoint for sensors that we use to determine presence in a designated Attention Nook. When a device is in use, it issues an API call to Home Assistant, which returns the binary presence values from the sensors deployed across the home. The device behavior is then modified according to the detected zone. For example, in an *Liberation Nook*, the device sends

²Everything Presence One: <https://shop.everythingsmart.io/products/everything-presence-one-kit>

³Home Assistant: <https://www.home-assistant.io/>

⁴Seede Studio XIAO ESP32C3: <https://www.seeedstudio.com/Seede-XIAO-ESP32C3-p-5431.html>

⁵ESPHome: <https://esphome.io/>

a GET request to confirm presence; if the response indicates that the user is indeed in that zone, the system sets the screen brightness to zero, effectively blocking use. Importantly, this friction can always be overridden by the user simply walking out of the zone.

On the macOS side, we implemented a lightweight Python script running as a persistent system service. This script handled all frictions by parsing API responses and triggering corresponding interventions. Brightness control was achieved through simulated keypresses that dimmed the display, while website blocking was enacted by dynamically editing the system's hosts file. This software-side implementation allowed for fast tinkering and adaptation of frictions.

A detailed system architecture is provided in Figure 2.

5 Making and Living with Attention Nooks

In this section we discuss four design events that encapsulate the complexities of designing, making and living with situated frictions. While there are thousands of minor decisions involved in making a new piece of technology, here, we foreground the influential decisions that shaped our encounters with the multiplicity of living with such technology as well as shaped the nature of the device itself. Our intention here is not to provide justification for the design, but to provide a rich description of critical tensions in a way that highlights the nuances of our realized speculation and hopefully provide a jumping off point for researchers who wish to explore situated frictions. These events allow us to absorb the “ongoing-ness and dynamic nature” [77] of autobiographical design.

5.1 Presence over Localization: Fighting Technosolutionism

Detecting an inhabitant's location in the home while they engage with a device inherently necessitates data collection that could potentially compromise their privacy. From the outset, our design goal was to utilize “privacy-preserving” technologies, steering clear of invasive methods like computer vision that gather excessive data. This required an initial phase of techno-centric exploration to understand how localization technologies could influence the experience of making and living with ATTENTION NOOKS.

We began our investigation with Ultra-wideband (UWB) technology, which enables precise localization and tracking through low-power radio signals. By measuring the time of flight and angle of arrival from an anchor to a UWB tag, we could determine the device's location without collecting more data than necessary, thereby preserving privacy. Although we developed a promising Proof-of-Concept using off-the-shelf UWB development kits, UWB remains a niche technology, primarily found in high-end smartphones. We encountered challenges early on. Anup needed an external module for his older Android smartphone to enable UWB functionality. Moreover, Anup's self-described “luddite” tendencies led him to implement various measures to reduce smartphone use, resulting in his laptop becoming the primary device for digital engagement.

This disconnect became apparent as Anup struggled to adapt his device usage to fit the UWB localization system, a process that diverted from the autobiographical design principles aimed at addressing the “genuine need” of the user. Instead, he found himself trapped in a technosolutionist mindset, focused on persuading

researchers that UWB represented the ‘optimal’ solution for our problem. He wrote:

“Considering that newer iPhones have UWB, I think it's okay to assume that all phones in the future will have some sort of UWB. [...] Maybe I can also try BLE and get the RSSI to gauge how far the device is from the beacon? This way the system will also work with older phones without needing the extra tag.”

While such systems thinking might be advantageous in a technosolutionist framework, it highlighted the pitfalls of approaching complex wellbeing-oriented research questions with a mindset geared towards validation rather than genuine understanding of lived experiences. The reality of utilizing UWB resulted in unnecessary complications that hindered the deployment of ATTENTION NOOKS in the home, leading Anup to consider limiting his exploration to a single nook. If this choice had been made, it would have severely restricted the ontological inquiry we intended to conduct. This necessitated significant personal reflection to pivot away from the technosolutionist framing towards a system that Anup could realistically live with. Ultimately, he transitioned to using “less novel” presence sensors (Figure 3) for the Nooks, allowing for quicker deployment in his apartment. Although this shift meant that this specific instantiation of ATTENTION NOOKS could only be effectively used in single-occupancy homes without pets, this technical limitation is irrelevant to our inquiry which revolves around meaningfully engaging with the rich complexities of living with ATTENTION NOOKS.

The challenges with UWB illustrates a broader risk in intervention design. Because interventions are often framed around achieving a specific goal such as reducing device use, it is easy to mistake the success of the system for the fulfillment of the underlying need. Anup's initial focus on optimizing UWB exemplifies this: the system could have functioned technically, but doing so would not have meaningfully supported his lived experience or the nuanced goal of fostering intentional engagement with space and technology.

5.2 Liberation is Impermanent: Fighting Re-habitation

A central challenge in digital wellbeing design is re-habitation: over time, users adapt to interventions, diminishing their effectiveness. Prior work has shown that light-touch frictions (e.g., a reminder notification to limit Instagram use) are easy to dismiss, while heavy-handed approaches (e.g., outright blocking an app) often drive users to uninstall the intervention when they need legitimate access. Lyngs et al. describe this design dilemma as finding the “Goldilocks level of support” [55]. Yet this “right” level of friction is not only user-dependent but also highly contextual, varying with goals, environments, and mental states.

Anup's own use patterns illustrate these tensions. For example, he blocked Reddit on his browser from 7-11am to protect deep work time. On some mornings, this intervention aligned with his intentions, allowing him to redirect attention back to work. On others, when he was mentally fatigued, the block felt untenable, leading him to delete the intervention entirely or circumvent it by installing a different browser. While often framed as self-control



Figure 3: Early explorations of ATTENTION NOOKS. Left: An early concept sketch exploring spiritual zones for wellbeing. Middle: Early techno-centric exploration using off-the-shelf sensors like the Everything Presence One connected to Home Assistant. Right: The sensor that we deployed for the various nooks in the home using an ESP32C3 running ESPHome and an LD2410C mmWave sensor.

failure, such attrition is a common reality of digital wellbeing interventions [65]. Our intention with ATTENTION NOOKS was to design frictions that could be bypassed not by disabling the intervention, but by physically leaving the space. This allowed interventions to serve a dual purpose: preventing overuse while preserving a cognitive-spatial link between certain spaces and protected, non-digital practices [46].

The first deployment was in Anup’s living room (Figure 4), where the couch had become a hotspot for prolonged, regret-filled laptop use. By dimming his laptop screen to black when in the nook, the living room was effectively transformed into a laptop-free zone. His intention was to redirect attention toward hobbies such as crafting and playing piano, turning the living room back into a space of “living” rather than scrolling. Although effective at first, Anup soon found himself retreating to the bedroom to continue laptop use:

“Ugh, this is really annoying. For the last two days, I’ve come back from work and I’ve gone straight to the bedroom and spent pretty much the rest of the day either watching random shit on YouTube or something I can’t even remember on Reddit. Why is this so hard, I thought I already built a habit of leaving my laptop out of the room. Maybe my willpower sucks. I think if I just use my laptop only at my desk, I can avoid a lot of this.”

This prompted Anup to install a second *Liberation Nook* in the bedroom, which again, proved effective for a time. However, problematic usage soon migrated to his desk. This was more complicated: unlike the couch or the bed, the desk was not a site of passive consumption but one of productive engagement. For Anup, “productive” engagement encompassed any meaningful or intentional practice such as reading newsletters through RSS feeds⁶ or exploring hobbies rather than being confined to work in the capitalist sense [29]. Blocking all device use at the desk was therefore impractical, as the desk also supported valuable explorations.

This led to the design of *Exploration Nook*, a blocklist-based intervention that restricted access to distracting platforms while

preserving intentional use. For Anup, this meant blocking YouTube and Reddit at the desk, while still allowing access in the kitchen, where YouTube tutorials supported cooking. Around this time, he also adopted Kagi⁷, a subscription-based search engine with LLM summaries, which enabled him to extract relevant information from Reddit or YouTube threads without engaging with the attention capture mechanisms of the platforms directly.

Through these iterations, ATTENTION NOOKS evolved from blunt spatial exclusions into more nuanced, context-aware frictions. Anup’s lived experience foregrounded the difficulty of calibrating frictions, as habits continuously adapted to new constraints. Each re-habitation not only revealed the limitations of interventions, but also surfaced insights into how boundaries with technology might be reimaged through the interplay of space.

5.3 Attention is Relative: Fighting the Multiplicity of Platforms

For a while, *Exploration Nook* at the desk worked quite well in spite of regular tweaks to the blocklist such as adding news sites and other attention sinks. Anup began to feel that he was developing healthier boundaries around technology use, and his home life was relatively stress-free on this front:

“I’m feeling quite good actually. I haven’t felt like I’ve used my laptop too much in the last couple of weeks at home and I’ve made way more time for other stuff. I can’t tell if this is just my mental health being generally better or if the nooks are actually working.”

Amidst this optimism, Anup took up woodworking as a hobby. His practice emphasized traditional hand tools, and while YouTube might have been the obvious resource, he gravitated toward old instructional books he found as PDFs. These proved more thorough and engaging, yet reading them at the desk introduced a new problem. Each time he encountered an unfamiliar concept, his instinct for deep research pulled him into other rabbit holes. The result

⁶Really Simple Syndication (RSS) specification: <https://www.rssboard.org/rss-specification>

⁷Kagi Search Engine: <https://kagi.com/>



Figure 4: The first deployment of a nook was on Anup’s living room couch. After banishing his laptop and phone from the bedroom, Anup recognized that the couch was a regular hotspot for prolonged problematic device usage.

was a sense of breadth without closure. He started many books but rarely finished them:

“I feel like I’ve read 5 books now to the exact same point of ‘knowledge’ and I keep reading the same information over and over again. When there’s endless information available about a certain thing, how can you know if you have enough information already? What if there’s something else that I’m missing?”

This tension highlighted how different activities demand different attentional modes. Reading benefits from uninterrupted immersion: simply sitting down with a book and continuing until one is done. Piano practice works the same way. Improvement comes from sustained playing rather than from diversions. The challenge of distracting platforms, beyond their impact on attention spans [60], is that they erode this ability to “stay on task.”

This realization shaped the design of *Immersion Nook*. Unlike blanket blocking, *Immersion Nook* functions through an allowlist, granting access only to designated apps or platforms while restricting everything else. In Anup’s case, this meant creating a reading nook where only the Books app was permitted. The system enforced this by dimming the screen to black whenever he strayed outside the allowlist, introducing friction that nudged him back toward reading. In this way, *Immersion Nook* helped sustain uninterrupted engagement, much like the earlier nooks, but tuned specifically for activities that demand immersion rather than exploration. While *Immersion Nook* might sound similar to *Exploration Nook*, in that it selectively allows certain kinds of activities, there remains an important distinction which is not only functional but also experiential. The *Immersion Nook* sets the conditions for absorption, where the design goal is to protect a fragile state of uninterrupted immersion. Cognitive psychologists describe this as vigilance or sustained attention [73]. It is also often referred to as “flow” in

creative practice [12]. In terms of attentional theory, this mode primarily recruits *external attention* [10], directing focus towards a stable sensory stream such as the printed page of a book or the sound of an instrument. An arm chair configured for reading exemplifies this orientation where the individual remains tightly coupled to what is directly in front of them.

By contrast, *Exploration Nook* acknowledges that many forms of work and learning require intentional movement across materials, sources, or tools. Rather than foregrounding external input, this mode depends more on *internal attention* [10]. Here, the role of design is not to eliminate switching but to channel it, supporting what can be observed as purposeful interleaving in knowledge work [25]. Academic writing, for instance, might be facilitated by easy toggling among digital libraries, reference managers, and a writing software while screening out unrelated platforms. Exploration, then, is less about shielding attention from distraction and more about scaffolding the inner work of assembling, comparing, and combining without allowing attention capture mechanisms to intrude. Designing with both modes in mind allows us to imagine environments not simply as “distraction-free”, but as tuned differently to the external absorption or internal orchestration that particular practices demand.

5.4 Signifying Spaces: Fighting Utilitarian Blurring

Spaces in the home signify their own utility. The presence of a stove marks a room for cooking, regardless of whether it is explicitly called a kitchen. Likewise, a chair surrounded by books carries the implicit meaning of a reading nook. As Bachelard reminds us in *The Poetics of Space* [4], objects and their arrangements imbue spaces with symbolic resonance, shaping not only how we act but also how we imagine ourselves within them. In this sense, spatial



Figure 5: Signifying ATTENTION NOOKS. (a) *Liberation* is represented through a clean island in a sea of noise, or through an explicit marker designating a phone-free zone. (b) *Exploration* is represented through dense but orderly lines within an island in a sea of noise, or through a marker indicating that Reddit is blocked. (c) *Immersion* is represented through a few focused lines within an island of noise, or through a marker showing that reading is permitted. (d) *Top*: a speculative extension of these signifiers to cultural contexts that incorporate spiritual practices of mindfulness. *Bottom*: exploded view of the signifiers we fabricated, showing the electronics, the canvas and the frame. The mmWave sensor can “see” through thin material.

meaning emerges not only from architectural form but from the everyday artifacts that anchor intention.

Situated frictions, as described in this work, allow us to demarcate zones for technology use, but these demarcations are often invisible. Nothing in the physical environment communicates their presence apart from a non-descript sensor. Anup began by exploring how to attach recognizable meaning to such spaces (Figure 5), turning first to the objects of childhood memory. The idea of using spiritual artifacts such as a Laughing Buddha figurine in a living room, offered a model of how small symbolic objects can charge a space with intention:

“When I was growing up, there was a small Laughing Buddha statue in the Living Room. I don’t know how this statue became pervasive in India, but somehow this was everywhere. I asked my mum what this statue meant and she said that it brings luck to the home. This is a weirdly powerful idea. I don’t know how I feel about using spirituality to signify a nook, but I think some people will resonate with this. Maybe some form of spirituality is what we need to get away from our phones anyway.”

Yet, while evocative, the explicitly spiritual framing risked being too culturally and religiously specific to serve as an inclusive

boundary object. What was needed instead was a more secular form of signification. This led to an exploration of signs, drawing on Pierce’s proposals for design through symbolic marking [80]. Just as a no smoking sign immediately marks a space as off-limits to cigarettes, a simple visual symbol can signify a zone of technological intention. Through such signs (Figure 5), ATTENTION NOOKS are made legible. They become boundary objects that not only remind Anup of their commitments but also communicate to others in the household, and the community, transforming the abstract idea of attentional modes into visible, re-imaginable features of domestic space.

6 Discussion

6.1 Digital Wellbeing: Practice, not prescription

Digital wellbeing is often framed as a problem with a technical solution: an app, a timer, or a blocking intervention promises to “fix” overuse. Anup also saw ATTENTION NOOKS in a similar light. Yet his exploration illustrates that wellbeing is not a static goal or a one-size-fits-all prescription. Rather, it is a practice, embedded in the rhythms of everyday life, shaped by context, habit, and individual intention. Treating wellbeing as a prescription risks overemphasizing compliance and outcomes, privileging metrics over lived

experience. This framing can obscure the subtleties of digital life: a technically successful intervention may not meaningfully support sustained attention, reflection, or intentional engagement. By contrast, a practice-oriented approach recognizes that digital wellbeing unfolds through iterative engagement with both technology and environment. It is relational: the user negotiates their habits, the affordances of devices, and the spatial and social contexts of use. Interventions such as ATTENTION NOOKS do not impose fixed behaviors but scaffold ongoing reflection and adaptation, supporting the messy, situated work of cultivating attention and focus. Framing digital wellbeing as a practice emphasizes the experiential, rather than the prescriptive. It highlights that meaningful change is neither immediate nor uniform: it emerges from sustained engagement, reflection, and tuning of both systems and behaviors over time. In doing so, it challenges the dominant discourse in HCI that seeks controlled interventions, demonstrating that wellbeing is less about compliance and more about living thoughtfully with technology.

In spite of the long process of designing, making, and living with ATTENTION NOOKS and deploying multiple nooks in his apartment (Figure 6), Anup still suffers from problematic device use in the home. He reflected on a new habit:

“I didn’t think it would happen but it did. I’m regularly using my phone in the toilet. I don’t know how this habit developed but I opened the BBC news site once and now it’s become a habit. I’ve also started intermittently checking other news sites at the desk. I can’t really tell if this is a compulsion or if I’m running away from something.”

Much like a diet, maintaining digital wellbeing is a practice. Making room for designs that support the practice can perhaps provide users with the agency to override persuasive platforms while also preventing users from feeling bad about their self-control failures. Normative messaging around interventions usually use goal-oriented provocative language that center the intervention as a way to unlock productivity, and ultimately, humanity. While this may provoke users to reflect on their usage, ignoring the consistent practice required to maintain digital wellbeing and providing a “pill” can lead to further self-blame.

6.2 Situated Frictions: Ontology or Teleology?

Digital wellbeing is a pressing societal concern that resists straightforward solutions. Attempts to “solve” such issues inevitably adopt a teleological stance seeking a definitive end state. Yet, wicked problems are characterized precisely by the absence of clear, exhaustive solutions [85]. While the techniques that optimize for attention and engagement have proliferated thanks to HCI’s empirical and progress-driven approaches, digital wellbeing increasingly lies within the realm of social policy, which demands different sensibilities [50]. Our own efforts reflect this tension: the desire to “prove” the value of situated frictions must contend with, and ultimately acknowledge, the deeply entangled realities of living with persuasive technologies. By employing an autobiographical design approach, we aim to foreground the richness and plurality of these everyday experiences rather than reduce them to singular outcomes.

We argue that meaningfully addressing digital wellbeing demands a more nuanced ontology, both in how we research the issue and how we design interventions. Traditional progressional teleology in HCI often privileges strong, universal claims about an intervention’s benefits, in service of clear policy guidance or generalized solutions. However, such claims inevitably simplify and flatten the rich, diverse realities of living with technology at home.

The frictions introduced in our nooks are intentionally modest and familiar; their effectiveness lies not in novelty, but in their adaptability to individual contexts and preferences. What constitutes a meaningful friction is inherently subjective: while a weekly screen time report on an app⁸ may prompt reflection for some, others might find more value in a tangible, material-focused summary like a printed receipt [90].

Designing for diversity and plurality rather than prescribing a “silver bullet” enables digital wellbeing to be treated as an ongoing, situated practice. By embracing this multiplicity, we move beyond reductive solutions and acknowledge the lived, evolving work required to foster intentional and healthy technology use.

6.3 Implications for Ubiquitous Computing

In Mark Weiser’s seminal vision for Ubiquitous Computing [103], he envisioned a future where technology is seamlessly integrated into everyday life, transitioning fluidly between the center and periphery of our attention. However, the current landscape of modern technology, dominated by the attention economy, dictates that platforms strive to capture and hold the center of our attention to maximize advertising efficacy. To some, it may appear that Weiser’s vision has been realized through the pervasive presence of smartphones and other smart devices, but we believe that the authentic integration of computing — one that unobtrusively supports daily life — is *held back* by the persuasive design of smartphones and contemporary platforms that thrive on exploiting human attention.

From a domestic ecology standpoint, the attention economy has ‘flattened’ the distinctive poetics of various spaces. Areas such as the bedroom, living room, study, and bathroom are each designed to foster and support specific activities. Integrating ‘convivial tools’ [38] into these environments necessitates context awareness, which is a challenge when every space is indiscriminately subjected to problematic smartphone use. For technology to truly be ‘invisible’ and seamlessly integrated, it must resonate with the unique poetics of each space, rather than being uniformly applied across all environments. ATTENTION NOOKS proposes a way to seek middle ground. While the ubiquity of smartphones offers certain advantages, selectively disabling these devices in restorative environments, can redirect our cultural focus towards what Illich describes as ‘Tools for Conviviality’ [38].

6.4 Indoor Localization: Subversion or Subservience?

A central conflict in much digital wellbeing discourse stems from the necessity of understanding the context of usage to deploy effective frictions. However, this understanding often necessitates further data collection, resulting in mechanisms that closely resemble those employed by persuasive designs. For instance, researchers

⁸iOS Screen Time: <https://support.apple.com/en-us/108806>

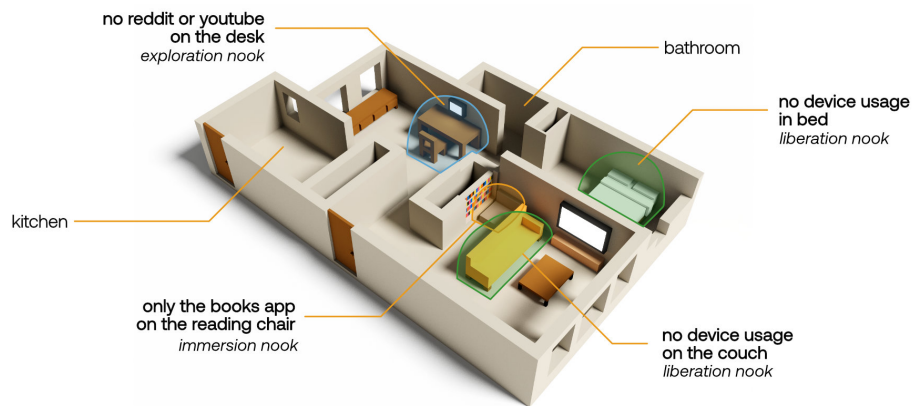


Figure 6: Anup’s apartment with all the nooks that were setup. Extraneous details in the apartment have been excluded.

have utilized machine learning to automatically predict when smartphone use may become “problematic,” relying on comprehensive data collection pipelines [92]. While the intended outcomes differ, the underlying tools and methodologies remain strikingly similar.

This situation raises critical questions about ATTENTION NOOKS. Specifically, is indoor localization an invasion of privacy? As Paul Virilio notes, “when you invent the ship, you also invent the shipwreck” [100]. Regardless of whether a design aimed at supporting digital wellbeing incorporates indoor localization, such technologies are continually developed and implemented without user consent. Notably, WiFi Sensing, which enables indoor localization through WiFi, was introduced in the IEEE 802.11bf standard [88] in 2023 and subsequently implemented in Comcast routers⁹ without any fanfare. In fact, WiFi motion sensing is a feature that can already be used by Comcast users who have the latest routers. Designers face a pivotal choice: either leverage such technologies to reinforce normative capitalist practices, or repurpose them to support autonomy and critical engagement. ATTENTION NOOKS explicitly pursues the latter, aiming to subvert conventional paradigms of surveillance and control while supporting situated digital wellbeing.

It is essential to emphasize that any intervention altering device usage based on indoor location must operate with informed user consent. Even well-intentioned systems risk harm if implemented authoritatively, potentially undermining wellbeing rather than promoting it. Digital wellbeing interventions must, therefore, foreground agency, transparency, and ethical stewardship in both design and deployment.

6.5 Multi-dweller Households: On the Inherent Sociality of Space

Our initial exploration in a single-person household provided a focused context in which issues of sensor precision, false positives, and frustration with system reliability were minimized. However, extending situated digital wellbeing interventions to households with multiple dwellers raises a host of new challenges, requiring deeper intentionality in both design and deployment.

In shared domestic environments, the application of spatial frictions may be most feasible in semi-private zones of the home, where individual preferences and boundaries can more easily be respected. The inherent “crudeness” of presence sensors, whether viewed as a limitation or embraced as a design feature, has different implications in a multi-dweller context; ambiguity may sometimes serve as a protective layer, preserving the privacy and agency of all residents. As more sophisticated sensing technologies inevitably become part of the home, the ethical stakes only increase, especially around processual ethics [23] and the gendered dynamics of domestic technology.

Care must be taken to ensure that digital wellbeing infrastructures do not become gatekept or unilaterally imposed by any one individual, reinforcing existing power structures [63, 64]. Instead, these systems should be designed so that any resident or community member can participate in setup, maintenance, and ongoing tinkering. Agency should be distributed, not centralized or withheld. A care-based framing offers a promising alternative: much as one senses care when a parent prepares the home environment, be it by setting up a humidifier or programming a welcoming light [27], digital interventions can be imbued with intentional care rather than enforcement. Especially in an era where screen time is a growing concern, shifting from an authoritarian “bestowal” of friction toward collaborative, caring practice can foster trust and mutual respect within the household. Further, the analogy of the sysadmin can be illuminating. Effective technological infrastructure is often invisible, only surfacing when it fails. Designing for “graceful breakdowns” where dwellers understand and can respond to system changes becomes essential for resilience and adaptation. Ultimately, systems that invite tinkering by all household members transform digital wellbeing from a fixed solution to an emergent, craft-based practice.

These considerations naturally open further questions: how might digital wellbeing become a community of practice, akin to the quantified self movement or local crafting circles? Can we cultivate shared engagement and learning around digital wellbeing, without pathologizing it as a personal failing requiring correction?

⁹WiFi Motion by Xfinity: <https://www.xfinity.com/support/articles/wifi-motion>

7 Conclusion

In this paper, we presented ATTENTION NOOKS: a framework of situated frictions that enables home-dwellers to renegotiate their relationships with pervasive technology use, with a particular focus on digital wellbeing in domestic spaces. Rather than offering a prescriptive solution, ATTENTION NOOKS invites home-dwellers to creatively configure specific zones—or nooks—in their homes to cultivate mindful, intentional, and situated modes of technology use.

Grounded in a Research-through-Design (RtD) methodology combining autobiographical design and critical making, our exploration foregrounds the lived realities, values, and ongoing tinkering that shape how digital wellbeing is enacted within the everyday messiness of the home. We contribute to broader conversations in HCI and digital wellbeing by reframing the “smart home” as a site of negotiation, practice, and craft where agency is exercised by reimagining relationships to it through localized, adaptable interventions.

We hope our work inspires others to treat digital wellbeing not as a matter of isolated self-control requiring pathological intervention, but as a dynamic, situated practice shaped by the material, spatial, and social arrangements of domestic life. By supporting the creation and adaptation of ATTENTION NOOKS, we seek to empower people to reclaim spaces for creativity, focus, rest, and genuine connection, pushing back against the seamless spread of the attention economy and restoring moments of agency in the places we call home.

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