Becoming Watchful on the Trail and at Home: Understanding Experiential Outcomes of Capra in Long-Term Use

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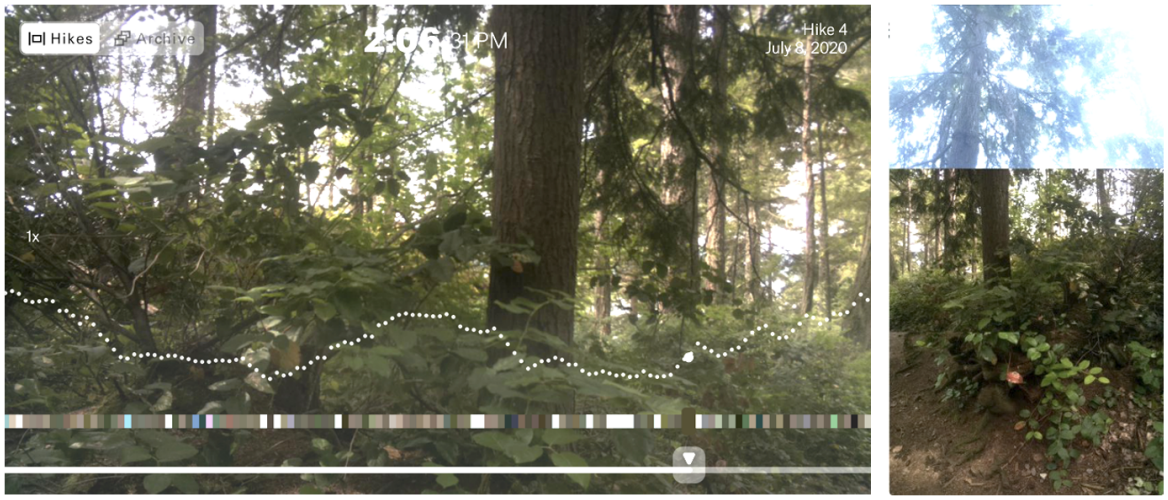

Figure 1: Revisiting a hike through the Capra Explorer. Left: Center point-of-view with metadata overlay illustrating time, color, and altitude in the timelapse series. Right: The same 'step' in this hike as on the left, except the Explorer has been rotated vertically to reveal the multi-point-of-view timelapse shown simultaneously, originally captured by three cameras on the Capra Collector.

Abstract

How might alternative encounters with personal hiking data support practices of noticing nature as well as changes in one's self over time? To investigate this question, we conducted a multi-year first person study with Capra—a system that combines the collection and exploration of hiking experiences in nature with an emphasis on longer-term, occasional yet indefinite use. Over several years, three researchers that represented different hiking frequencies, paces, locations, and life stages concurrently and independently hiked, used, and lived with Capra. Findings revealed unique individual and collective changes in attitude among the team, from an initial interest in intentionally capturing specific natural phenomena towards a shift in attentiveness when re-exploring hikes as well as when hiking outdoors. It is these insights that emerged through our long-term experiences with Capra that we present and reflect on in this paper.

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CCS Concepts

• **Human-centered computing**; • **Interaction design; Interaction design theory, concepts and paradigms.**;

Keywords

Personal Data, Hiking, Outdoor Technologies, Slow Technology

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1 Introduction

Hiking can support self-discovery and connection to the natural environment [23]. As a practice, hiking offers ongoing opportunities to creatively explore and deepen one's relation to natural ecologies [4], to pause and reflect on one's place in the world [129], and to cultivate social bonds with trail companions—whether human [69] or non-human [48]. Since the advent of photographic technology in the 1800s, capturing visual records of outdoor experiences has been a common desire for people (e.g., [47, 65]). Revisiting such records can nurture human-nature relations by promoting newfound ecological awareness [80, 111], and can also support self-growth through the recollection of past experiences outdoors [130]. Taken together, these works underscore hiking as a fundamentally entangled practice in which individual self development, social relations, evolving nature-connections, and technological mediation mutually shape one another.

Against the backdrop of this entanglement, the growing presence of mobile and wearable technologies in everyday life has made hiking experiences increasingly recorded, quantified, and aggregated. Commercial devices like Insta360 and GoPro cameras emphasize rapid capture, editing, and sharing of outdoor experiences on social media. Data-tracking platforms such as FastestKnownTime [147], Strava [148], AllTrails [149], or Komoot [150] provide real-time features to optimize hiking routes (e.g., 'wrong-turn alerts') and promote socially driven quantified comparisons of performance. While these technologies offer clear benefits, it remains unclear what roles technology could or should play in shaping outdoor experience. Researchers have raised concerns about the consequences of digital technological mediation of human-nature relations (e.g., [5, 22, 91, 112]), while also identifying opportunities to design meaningful interactions with data during or after time spent in nature (e.g., [14, 78, 89, 105]). More broadly, as people amass vast archives of digital records documenting everyday life, there is a growing need to design technologies that offer alternative representations of personal data—moving beyond "*an exclusive interest in performance, efficiency, and rational* [self] *analysis*" [34:48] and toward repositioning data "*as something that is lived, situated, and contextual, making designs that are clear to the entangled phenomena of being*

Figure 2: The Capra Collector sliding into the Capra Explorer. This action triggers data transfer of recently collected hikes on the Collector into the archive of all hikes stored and viewed on the Explorer.

in the world" [121:13]. These concerns are reflected in calls within the HCI community to design interactions with personal data that better support contemplation, interpretation, and slowness. (e.g., [26, 75, 121, 137]). Yet examples that demonstrate such engagements through the study of new design artifacts remain relatively sparse, particularly in the context of hiking and dwelling in nature.

How might alternative encounters with personal hiking data participate in reshaping one's sense of self as a hiker, a body, and a person in relation to the natural world? In what ways could human-nature relations shift as digital records of hiking slowly accumulate and are revisited over time? And, considering hiking as a lifelong, reflective, and social practice, how might perceptions of hiking data transform as a person, their archive, and their recollections of past lived experiences age together?

To explore these questions, we conducted a multi-year first-person study of three authors (Will, Sam, Jordan) individually using *Capra*—a system that combines the collection and exploration of hiking data with an emphasis on longer-term, occasional yet indefinite use. The Capra system consists of two artifacts: the Collector and the Explorer. The Collector is a wearable camera device that captures timelapse digital photos from three different angles during hiking sessions, embedding each image with time, altitude, and color metadata. After being worn on a hike (or hikes), the Collector transfers hiking data into the Explorer (**see** 2). The Explorer enables a person to navigate and revisit different timelapses of their hikes through three filters: time, altitude, and color (**see** 1). These different data-enabled perspectives can be applied when revisiting *a single hike*—offering different durational ways to attend to moments in a hike—or *across all hikes*—enabling explorations of various interconnections across a long-term personal hiking archive.

Our long-term, first-person investigation with Capra examines how personal hiking data, encountered through this slow, documentary archive, can support ongoing, open-ended experiences—such as watching, revisiting, contemplating, and exploring—and how these experiences participate in reorganizing one's evolving sense of self and relations to hiking in nature over time. We also treat lifelong hiking history as a temporal dimension aligned with *slow technology* [52, 95], considering how this framing might offer a productive lens for supporting personal encounters with hiking data that unfold and transform over time.

Over the course of several years, three authors with varying hiking patterns—differing in frequency, pace, location, and life stage—used Capra. We adopted a longitudinal first person approach [42, 85], each living and hiking with our own Capra system, engaging with it to different extents while collectively reflecting on how our personal hiking data archives and self-understandings evolved. Our findings reveal shifts in attitude and in how we position ourselves as hikers in relation to particular trails and environments: initial interests in capturing specific natural phenomena gradually evolved into more complex and often ambivalent forms of attentiveness, both when hiking outdoors and when revisiting recorded hikes. Over time, Capra supported self-determined ways of becoming more watchful of nature and of oneself, and enabled the accumulation of personal life histories that could be meaningful, emotionally confronting, and occasionally disorienting.

This paper presents and reflects on the insights that emerged from our long-term engagements with Capra. Our work offers two contributions. First, it provides insights into how a slow design artifact can support becoming more watchful—both of nature and of oneself—by validating an interaction model that emphasizes occasional yet ongoing use, and by showing how long-term encounters with personal hiking data can participate in reorganizing one's evolving sense of self. Second, it presents a rare, long-term design research case that deepens understanding of how slow technologies can be integrated into people's lives and evolve alongside changing bodies, relationships, and places over time.

Figure 3: Left: The Capra Collector, mounted with standard GoPro hardware, is worn on a backpack strap. Here, the backpack rests on the ground at home after a hike with the Collector and bear spray still affixed. Right: The Collector can be easily removed from the backpack to capture vistas beyond the hiker's immediate perspective. Here, it is placed on a rock and pointed toward a waterfall while recording.

2 Background and Related Work

2.1 Hiking in Nature

Hiking is a cyclical practice that invites people to return to nature throughout their lives. While there is little contention over what hiking is, the term *nature* is subject to various interpretations. A widely held contemporary definition describes nature as the physical world and the non-human entities—like fungi, plants, trees, animals—that inhabit it, all of which are essential for human survival (e.g., [29, 151]). This view casts nature as the natural environment surrounding humans and positions it as both a resource and space for human flourishing. However, this view has been critiqued for artificially separating humans from nature, reinforcing a hierarchical binary that privileges human exceptionalism. In contrast, other perspectives challenge this separation by framing nature as relational and continuously negotiated, where humans are fundamentally entangled within the broader ecological systems of non-human actors and environmental processes (e.g., [4, 23, 53]). Thus, adopting the practice of hiking in nature is also to enter into a multiplicity of motivations and meanings, shaped by how one understands their place in the world and their ecological identity.

Hiking can offer opportunities to recharge [130], socially engage [57] or disengage [54, 105], raise awareness of environmental issues [10], and to form new relationships with nature [135]. In HCI, hiking has been studied as a means for facilitating social interaction [71], building online communities of practice [57, 72, 120], improving terrain maps [30], mitigating conflicts with wildlife [15], and enhancing local landscape knowledge [64, 73]. Commercial hiking applications, like AllTrails, have been critiqued in HCI for an underlying focus on fitness and a lack of body inclusivity [124]. Novel hiking technologies have also emerged, such as HOBBIT, a mobile app designed to help people avoid other hikers on the trail and preserve solitude [105]. In parallel, researchers have begun exploring environmental sensing systems that prompt in-situ reflection on human-nature connectedness in the wild (e.g., [1, 2, 21, 46, 141]). This growing body of work calls for further research into the interrelations among human and non-human assemblages, especially through alternative, interpretive forms of data captured in nature.

The works reviewed here share a common perspective: that time spent in nature is beneficial for people. However, the role that technology should—or should not—play in shaping outdoor experiences remains unclear. Research on the cognitive costs of distracted hiking has shown that smartphones on the trail can diminish one's capacity for memory-making, wayfinding, and curious exploration [3, 90]. Coyne critiques mobile devices for creating barriers between people and the outdoors, while also recognizing their potential to uncover "*aspects of our experience of the natural world*" [22:30]. Anderson and Jones call for a re-thinking of mobile computing where "*human-nature interaction holds priority over human-computer interaction*" [5:293]. Similarly, Häkkilä et al. argue that *unobtrusiveness* must be the primary concern when designing new technologies that mediate experiences in nature [49]. They emphasize that future HCI research must respect "*the maintenance of natural experiences as a respite from technology* ...[through] *exploring the balance between supporting (or mandating) non-use of technology with the potential benefits of technology use*" [49:7]. Collectively, this research points to growing concerns over the potential negative effects of technology mediating human-nature experiences, while offering concepts, such as *unobtrusiveness*, to better guide future design initiatives.

Our work contributes to this body of research by offering a long-term case of first-hand experiences with Capra—a device designed to support unobtrusiveness in the wild while enabling reflection through hiking data at home. We examine how Capra's multiple visual and data-enabled perspectives opened up alternative ways of relating to nature, raising new possibilities for how technology might support nature awareness and ecological self-understanding. At the same time, we attend to frictions that challenge the extent to which any technology can be 'unobtrusive' on the trail, prompting critical reflection on the boundaries, limitations, and unintended consequences of technologically mediated human-nature relations.

2.2 Becoming Watchful & Cultivating Ecological Sensibilities

Since Anna Atkins' early use of cyanotypes in the mid-1800s to create visual records of algae, technology—particularly photography—has played a key role in helping people document, explore, and better understand elements of the natural world [40]. Contemporary works have continued this tradition, highlighting how photography supports reflective experiences of noticing and foster human-nature relations (e.g., [39, 65, 80, 111]). Many of these works draw on Anna Tsing's concept of the 'arts of noticing' [138] to inspire "*the re-examination of research assumptions as a means of pursuing alternative pathways towards preferable futures*" [83:378]. Recent HCI research explores how noticing can help attune design practice to non-human actors (e.g., [12, 21, 78, 80, 83, 102]). Researchers have also suggested that noticing may serve as a generative resource for creating alternative technological interventions (c.f., [74, 133, 146]). Liu et al. [82] argue that better acknowledging 'companion species' can help cultivate human-nature interactions with technology. Livio and Devendorf [84] and Oogjes et al. [101, 102] position noticing as a way to better account for human and non-human entanglements in design practice. Rosén, Normark, and Wiberg propose design research can facilitate "*sensory-rich and situated noticing*" through tangible environmental sensing prototypes [118:12], such as those aimed at making soil composition legible [116, 117, 119]. Liu, et al. [78] contribute a design-led approach that leverages wearable technologies to amplify awareness of local ecological wellbeing. Biggs et al. explore how creative audio and literary practices can extend attention toward animals, the ecologies they inhabit, and the land histories that shape them [11, 12, 93].

While diverse, these works are united in their aim to extend design research toward enabling people to "*become watchful*" [111] and foster a relational sensibility [4]—one that emphasizes the interconnectedness of human and non-human assemblages in the natural world and, through this, an evolving ecological sense of self. Attuning to the autonomy and interdependence within ecological systems can be understood as an initial step toward cultivating a sensibility for perceiving and engaging with the environment that values "other pathways—appreciating beauty, making meaning, feeling emotions, or showing compassion in relation to the natural world" [111:9]. Aligned with this goal, the works reviewed above begin to articulate design opportunities that nurture human-nature

relations through experiences of watchfulness, awareness, and connectedness. Yet, this research space remains emergent. More work is needed to develop methods, approaches, and long-term design case studies that can guide future research in HCI and beyond [12, 21, 70, 83, 133]. Notably, while concepts like nature connectedness, watchfulness, and especially Tsing's *noticing*, have gained traction in HCI, the majority of studies have focused on short-term field trials and experiences. In contrast, we contribute to this growing area through a critical reflection on years-long engagements with an interactive system designed to redirect attention toward different aspects of nature, situated within our own evolving hiking experiences and sense of self over time.

2.3 Personal Data, Lived Informatics, & Slow Technology

There exists a trajectory of HCI research on systems that record, document, and re-present people's everyday lives. SenseCam is an exemplar of such technologies: embodied in the form of a wearable camera, it creates a first person point-of-view visual record of a person's life that can be revisited [58, 125]. Lifelogging technologies like SenseCam prompted enthusiasm and critique. On the one hand, they seemed to promise rich records of everyday life and one's actions in the past. On the other hand, they raised critical questions about the desirability and limits of "total capture" and how such digital traces relate to lived experiences and memory. Findings from field studies revealed that SenseCam images do not simply act as a 'prosthesis' for replicating memory, but can render the past as strange, fragmented, and yet enriching, inviting people to craft narratives about who they were at different times and in different places [55, 126]. Rather than treating digital traces as neutral records for recollecting the past as a 'data retrieval task', this work frames them as resources for narrative reconstruction, performance of character, and ongoing self-understanding where the past is conceptualized as "a place *one ventures into*" [55:278]. Beyond lifelogging, a substantial body of research has investigated how personal data can be given local form within the home, where it can be engaged with as part of situated experiences of self-reflection (e.g., [43, 67, 68, 96]), extended to cherished objects (e.g., [41, 103, 144]) or re-encountered through new interfaces and visualizations (e.g., [59, 66, 132, 136]). This research often treats data not as transparent evidence but as material for memory work: a way to revisit and reinterpret one's own history.

Personal informatics refers to technologies and practices through which people collect personal data to better understand themselves and achieve personal goals [76, 86]. Such systems frequently generate detailed quantitative records of daily life (e.g., step counts, heartbeats, calories) to help people understand life practices, bodily processes, or behaviours, often in service of self-improvement or behaviour change (e.g., [6, 36, 87]). However, scholars have critiqued these normative approaches as overly rationalistic and technology-centric, assuming linear progress from data to insight to action. In response, *lived informatics* reframes personal data practices as entangled with everyday life: people continuously decide what to track, select tools, track and act for a while, lapse, resume, and often use multiple systems in parallel [37, 115]. This work highlights documentary tracking and curiosity-driven logging alongside goal-oriented tracking, and emphasizes that people's engagements with their own data are partial, episodic, and shaped by changing circumstances rather than by stable, long-term plans. Lived informatics advocates for shifting focus beyond 'useful' behavior change goals to other considerations, such as situated experiences of "the emotionality, the hope, and the fun people may have" [115:1172] – including when they track primarily to document and remember, rather than optimize.

Building on this, researchers have argued that personal data are "not simply a way of creating copies or impressions of reality, but are also a means of communicating personal narrative, identity, and a felt sense of self (selfhood)" [32:650]. They call for design research that treats data as interpretive resources for *technologies of memory* [139], aiding in "seeing and shaping ourselves" [143], enabling data to "settle in place" [131] as part of everyday life. In parallel, *wayfaring* [115] and *venturing* [55] have emerged as generative concepts for navigating trajectories of life experiences, stories, and associations within digital personal archives. Specifically, leveraging different forms of (meta)data as filters for wayfaring has been suggested as an opportunity to open up new ways of orienting to key events, life histories, and lifelong practices bound up in large archives of personal data (e.g., [18, 19, 104]). Recent work highlights the value of designing interactions with data that evolve and age over time (e.g., [61, 100, 137]). Yet design research in this emerging space remains limited, particularly with respect to understanding how long-term, documentary records can support shifting perspectives on people's lives and senses of self over extended timescales.

A growing body of work explores how slow technology can support alternative encounters with personal data. Many of these draw on Hallnäs and Redström's vision of slow technology, which calls on designers to embrace deeper temporal trajectories to create "technology that surrounds us and is part of our activities over longer periods of time" [52:203]. Examples such as Photobox [96], Long-Living Chair [107], Postulator [56], Reflexive Printer [136], Olly [97] and Memory Tracer [145] demonstrate that slowness can enable sustained human-data relations by pacing how and when data is revealed, and by inviting reflection instead of continuous monitoring. Recent research further advances this vision by exploring different conceptualizations of temporality in design (e.g., [95, 106, 108, 109]). Projects including Bio-Digital Calendar [9], Olo Radio [100], Soft Fading [26], and PhotoClock [18] show how design can move beyond treating "time" as merely a matter of pacing and instead support rich, evolving interactions with personal data that accrue patina, gaps, and reinterpretations.

Collectively, these strands of work highlight the value of treating personal data as interpretive, situated, and unfolding over time. They also suggest that personal archives can play a role in mediating and reorganizing selfhood by providing materials for telling different stories about one's body, relationships, and evolving place in the world. Our research builds on and connects these trajectories by contributing multiple long-term, first-person accounts of how hiking data were captured and transformed into reflective resources for exploring life experiences in nature. We treat Capra as a slow, documentary hiking archive that leverages metadata-based perspectives (time, altitude, color) to support occasional yet ongoing engagements with personal data. We reflect on key design

Figure 4: We created a small batch of three Capra research product systems that were used by Will, Sam, and Jordan for several years, respectively.

qualities, grounded in slow technology and lived informatics, that shaped how this data gradually "settled" into our lives—becoming increasingly significant, interconnected, and sometimes unsettling over time—and how these evolving encounters with hiking data participated in reorganizing our sense of self in relation to ecologies, bodies, companions, and places, including periods of lapsing and resuming use.

3 Methodological Approach

Previously, we described and reflected on the process of creating a single Capra design artifact with attention to design decisions explored across it [99]. Our earlier work did not account for any experiences with the Capra design artifact beyond the design process itself. We extend this work by developing a small batch of three robust Capra *research product* [98] systems to conduct a long-term first-person inquiry into their use by three authors of this paper – Will, Sam, and Jordan, respectively (see Figure 4.). Below we summarize the Capra system's key features and then detail our own longer-term design research approach.

3.1 Capra: Vision and Long-Term Field Study

A core goal of Capra is to create space for engaging with personal hiking data in ways that invite multiple perspectives—through alternative vantage points, sequences, and seasonal or multi-year journeys as one's archive grows. It also aims to explore how piecemeal, long-term encounters with data collection and reflection can shape a person's relationship with the ecologies they hike through, as well as with themselves and their hiking companions. The design is grounded in the philosophy of slow technology [51, 52, 95], particularly the propositions that slow technologies: (a) *require time to understand*, (b*) must exhibit a quality of fit in both background presence and active use*, and (c) *change over time.* Capra consists of two interrelated artifacts: **the Collector** and **the Explorer**.

The ***Capra Collector*** has three lenses affixed at different angles that capture Multi-Point-of-View (Multi-PoV) timelapse photos and encodes them with three forms of metadata: time (timestamp for date and time of day), altitude (above sea level), and color (dominant colors). When worn on the body, the central camera offers a more recognizable PoV, while the other cameras capture photos from more unusual angles (e.g., the blue sky above or roots underfoot below). The multiplexing of these three cameras is able to creates unique tryptic compositions that can be nearly seamless or highly *seamful* [16] (i.e., offset) depending on the Collector's orientation and movement. Taken together, these three vantage points decenter a hiker's gaze and instead situate the hiker within a surround of sky, ground, and trail—recording how the body moves through an environment rather than solely looking at it, which later could become important for how one understand their self in relation to particular places.

Figure 5: The Capra Explorer in situ. Left: Capra hiding next to the books in the bookshelf in Will's living room where it lived while not in use. Right: a common place of use in the living room, projecting in vertical mode.

Every five seconds, a set of three photos—one from each camera—is captured. At the beginning of a hike, the Collector is turned on to start recording and continues to do so until the journey ends. Aside from a 'pause' function, there are no other direct interactions during use. The concept of *unobtrusiveness* [5, 49] strongly shaped the design of the Collector, with the intention of prioritizing human-nature interactions over human-computer interactions while on the trail. Lived informatics emphasizes attending to the *physicality of tracking* and *design for interweaving* [115:1172]. In line with this design guidance, the Collector clips onto existing backpack straps, sits close to the body, and adds minimal weight, so it can be worn on hikes or left at home among other gear and domestic objects. Through its minimalist interaction design, compact form factor, and small, highly optimized components, the Collector silently documents the hike. It recedes into the background, fading from immediate awareness, and remains out of direct 'use' while in operation.

The Collector operates for approximately 11 hours on a full charge and can store data from multiple hikes internally, if needed. Upon returning home, the user inserts the Collector into the Explorer to initiate the wireless transfer of new hiking data into their full archive. Depending on the number and duration of new hikes, this process typically took us between 1 to 6 hours. Aligned with lived informatics research that emphasizes lapses and resumption rather than continuous tracking [34, 37, 115], the Collector's ability to hold several hikes and to be put away for weeks or months without reconfiguration was an intentional design choice: it could drop in and out of use as hiking practices, seasons, injuries, or life circumstances changed, and still contribute to a growing archive when picked up again.

In the original Capra concept [99], we envisioned and designed a "transfer animation" that would activate during this period: the Explorer's built-in projector would display images from the new hikes, interwoven with photos from the existing archive based on metadata similarities. However, during the development of our own original small batch of Capra systems for our long-term field study, we encountered practical limitations that prevented us from supporting this feature. Specifically, transferring, resizing, and preprocessing metadata for the system's three filters took approximately 6–7 seconds per photo—resulting in over four hours of processing time for a 3-hour hike. Extending the transfer time beyond two hours introduced thermal risks: the heat produced by the Explorer's projector threatened the long-term durability of the system, potentially requiring complex repairs or leading to total failure. As a result, we opted to bypass this conceptual feature in favor of ensuring the system's robustness. Over five years later, this trade-off proved to be a good decision as all Capra systems remain operational.

The ***Capra Explorer*** is a book-like artifact where all hiking data is stored and explored. It allows users to revisit timelapses of their hikes through three metadata filters—*time*, *altitude*, and *color*. For example, one might explore changes in light over the course of a day, reflect on ecological variation across different altitudes, or navigate hikes via a continuous color spectrum. Taken together, these three filters act as distinct lenses on the same archive—foregrounding daily solar/lunar rhythms (time), relations between bodies and terrain (altitude), and seasonal or atmospheric tones (color)—which, over time, can become important for how we understand our own trajectories as hikers. These perspectives are accessible through two modes: *Hike Mode*, which allows for in-depth exploration of a single hike, offering multiple durational ways of attending to its moments; and *Archive Mode*, which enables exploration across the entire collection of hikes—supporting journeys through time, elevation, and chromatic connections. Each new hike transferred into the Explorer dynamically creates new *interconnections* [95] to existing hikes based on shared or diverging metadata. This enables emergent pathways that are known, partially known, or unforeseen. In line with lived informatics concepts of *wayfaring* and *venturing* ([19,33,55,115]), the Explorer is not designed for exhaustive review or 'catching up' with all data, but for occasional and ongoing, self-directed wanderings through the archive as it grows. The Explorer's design expresses the quality of *implicit slowness* [95] by granting users a high degree of control while requiring time to interpret, attune to, and meaningfully navigate the archive. Its physical orientation shapes the viewing experience: when placed horizontally, it projects a central point-of-view timelapse alongside

a metadata overlay relevant to the chosen filter (e.g., time, color, or altitude). This overlay fades after three seconds of inactivity, allowing the timelapse to continue uninterrupted. When rotated vertically, the Explorer presents the Multi-PoV timelapse without overlays to emphasize its triptych visual form (**see** 5). Users can easily toggle between these display modes by tangibly reorienting the device.

3.2 First-Person Approaches Integrating Multiple Perspectives & Design Research

Our methodological approach builds on first-person perspectives in HCI that situate the researchers as active participants in the research (e.g., [25, 63, 85, 92]). This tradition draws from broader movements in the social sciences to embrace the subjectivity of a researcher and acknowledge the inherent value and limitations that come with the socio-cultural context their research is conducted in [8, 31]. We are inspired by work that actively intertwines the often messy and novel processes of design research with multiple perspectives of research team members (e.g., [7, 17, 25–27]). In this spirit, we treat our own long-term engagements with Capra as lived, situated cases through which to examine how a slow, documentary archive might become entangled with particular lives and senses of self. We are especially influenced by adoptions of duoethnography or trioethnography in design research where members of the research team present and discuss their individual experiences with a design artifact (or artifacts) (e.g., [28, 45, 60]). We aim to build on these works through juxtaposing the voices, retrospective narrative vignettes, and images (photos taken during our hikes and from the *Capra Collector*) of multiple research team members that hiked and lived with the Capra system over several years to highlight similarities and differences in our experiences. Approaches that integrate multiple first-person perspectives offer potential to open avenues for plural forms of learning and knowledge production that embrace the situated, idiosyncratic, and, at times, vulnerable accounts of experiences that they offer access to [122, 123]. First-person approaches also recognize the value of incorporating retrospective reflections from one's life—spanning weeks, months, or even years prior to engagement with a design artifact—to further contextualize the artifact's individual, collective, and cumulative effects [45, 60, 62]. In our case, this includes drawing on earlier hiking histories and biographical shifts (e.g., moving, changing relationships, injury, parenting, and so on) that shape how Capra's archive is taken up and what it comes to mean for each of us.

Given the longer-term nature of our research questions, our methodological approach offered a unique opportunity to notice, discuss, and critically reflect on several years of lived experience with Capra—spanning multiple cycles of seasonal change and personal growth. We also acknowledge the vulnerability inherent in such an approach: long-term first-person inquiry brings risks of unintentionally exposing deeply personal aspects of one's life, especially because emotional associations with past experiences may change over time. As a team, we engaged in critical and iterative discussions about the ethical risks of self-disclosure early in the study design. Ultimately, we felt comfortable proceeding, as this approach enabled a rare depth of understanding that would be difficult to access through traditional field studies with external participants. Initially, we considered hiking a relatively innocuous activity—how much of our personal lives could truly be revealed by a system capturing time spent walking in nature? As we describe throughout what is to come in this paper, the answer proved far more complex.

3.3 Project Team and Background

Will, **Sam**, and **Jordan** began individually using their Capra systems in the summer of 2020, during the peak of the COVID-19 global pandemic. At the time, all three of us were based at a university in British Columbia, Canada (**Will** and **Sam** still are). Each member represented different hiking frequencies, paces, locations, and life circumstances. Given the more than five-year duration of the project, it naturally intersected with numerous major life events: **Jordan** graduated from graduate school and relocated; **Sam** navigated social and professional transitions from undergraduate to graduate studies; **Will** became a parent for the first time and experienced a serious knee injury (unrelated to hiking). During this period, we also contended with multiple summers of intense forest fire smoke in British Columbia, the ongoing effects of the pandemic, and multiple instances of bereavement across the team. These experiences inevitably shaped our individual hiking practices—both in frequency and form. Nonetheless, each of us developed a substantial hiking data archive. We see the diversity of use across our team as both beneficial and representative of how people engage with lifelong practices like hiking, which often involve alternating periods of intense activity and pause.

As a step toward further acknowledging the subjective positions inherent to our approach, Table 1 offers details on our backgrounds and time spent hiking with Capra. One's engagements with nature and hiking are "made possible by a complex historical, political, social, and economic forces that shape each person's ecological identity, or the way in which we relate to nature" [35:1]. Thus, we must acknowledge the power structures and privileges that shape how people relate to the natural world, and that have shaped our own individual and collective interests in hiking. National parks, particularly within former British settler colonies (such as Canada), have maintained legacies of frontier colonialism and narrow understandings of "legitimate outdoorspeople as necessarily White, able-bodied, straight, and male" [128:242]. These legacies overshadow the mobilities of many people, including female hikers, LGBTQ+ hikers, BIPOC hikers, and hikers with disabilities [38, 110, 128]. Thus, we approach our research from a place of privilege and humility. The first-person narrative in this paper is from a white able-bodied perspective, while other voices, bodies, and entities appear and are interwoven too (e.g., partners, children, human and non-human friends, wild animals, rocks, trees and soil on the trails). Our positions influence what we notice, which frictions we are able to name, and which relations to nature and selfhood are foregrounded in our analysis. Clearly, a diversity of perspectives is needed.

3.4 Documentation & Analysis

Due to the extended period of living with Capra, our documentation and analysis unfolded in multiple phases. As we began our study in Summer 2020, we created a template for documenting, sharing, and

Team	Background	Time with Capra	Number of Hikes	Location of Hikes
Will	American & Canadian; White Man; Early 40s; Occupation: Associate Professor (Assistant Professor when this project started).	Summer 2020 – Ongoing (as of September 2025)	62	British Columbia, Canada (hikes were predominantly lower-mainland coastal BC, with a minority of hikes in norther BC and on West Coast Vancouver Island).
Sam	Canadian & Australian; White Man; Early 30s; Occupation: PhD Candidate (Undergraduate Student when this project started)	Summer 2020 – Summer 2023	25	British Columbia, Canada (hikes were balanced across lower-mainland coastal BC, Vancouver Island, Eastern BC, and Northern BC).
Jordan	American; White Man; Early 30s; Occupation: Senior Interaction Designer (Graduate Student when this project started).	Summer 2020 – Summer 2023	98	British Columbia; Yukon; Northern Territories, Canada; Pacific Northwest; Southwest; Midwest, United States (hikes occurred across this wide selection of geographical places, with BC being the most predominant).

Table 1: Overview of Will, Sam, and Jordan's respective background, time using Capra, hikes recorded on it, and general geographic location of hikes.

organizing notes on our experiences with Capra. We left it open for each team member to document reflective annotations of events, impressions and moments that happened during a hike or anytime later when interacting with the Explorer (whether soon after the hike, weeks or even years later). We wanted to maintain this level of openness for numerous reasons—for example, to gauge the relative level of 'unobtrusiveness' of the Collector over time, to understand similarities and differences among situated experiences with Capra, and, in the spirit of exploring open-ended interactions with hiking data, to be open to unexpected insights that may emerge as our experiences with Capra accumulated over several years. As our engagement deepened, we compiled reflections through a variety of materials—individual research journals, written notes, and annotated images from hikes that captured emerging observations. Drawing inspiration from duoethnography and trioethnography [26, 60, 122, 123], we organized our narratives in parallel, creating points of comparison and dialogue across our diverse experiences with Capra over time.

Emerging insights and open discussions among team members were shared through routine bi-weekly project meetings. Guided by our research questions, these discussions spanned various topics including: impressions of hiking locations; notable encounters with wildlife, natural fauna, and other hikers; excitements and ambivalences in what the Collector captured; epiphanies and confusions in using the Explorer; situated self-recognized changes over time in relation to hiking and the Capra archive; broader personal life events, accomplishments and struggles contemplated during hiking sessions, and so on. All reflective annotations, photographic snippets, and subsequent summarizing comments emerging from our meetings were integrated into a shared online board (via the Notion application). This produced a diverse corpus that included: (i) time-stamped written reflections, (ii) images and image excerpts from the Explorer, and (iii) structured meeting notes capturing our discussions of particular hikes, archive views, and life events.

Our analysis was an ongoing and iterative process. We organized individual insights captured through our Notion board and outcomes from discussions about hiking and living with Capra, along with meeting notes and photos. This analysis process allowed us to retrospectively trace back key moments that later occurred to us as pivotal or important in our respective shifting perceptions and uses of Capra. Throughout our analysis, we made note of key insights and events that spoke to our research questions about watchfulness, selfhood, and human-nature relations, as we considered each other's perspectives.

In 2023-2024, we conducted a more formal round of thematic analysis [13] on this corpus. All members of the research team participated in the coding, using a hybrid approach that combined open (inductive) and more focused (axial) coding. First, we engaged in open coding of our written reflections and meeting notes without predefined categories—identifying recurring situations (e.g., particular trails, seasons), types of encounters (e.g., solitude, wildlife, companions), and felt responses to the Collector and Explorer (e.g., comfort, discomfort, attachment, ambivalence). We then moved to axial coding, clustering related codes and examining how they connected across people and over time—for example, how certain archive views surfaced earlier life phases, social or individual changes; or how increasingly unique self-determined uptakes or

lapses in use aligned with shifts in self-understanding and nature connectedness.

We met regularly (online and in person) to compare codes, discuss disagreements, and refine our categories. During these meetings we iteratively grouped codes into candidate themes, checked them back against the underlying material (e.g., journals, images, meeting notes), and merged or split themes where they were too broad or too narrow. This process ultimately yielded the set of themes that structure our Findings section, each capturing a distinctive way in which Capra's long-term archive participated in changing how we became watchful, how we related to past and present selves, and how we experienced the limits and consequences of technological mediation in nature.

It is important to note that the time period of summer to late 2023 was marked by various life commitments (e.g., birth, bereavement, momentary health issues, new professional positions, relocations, and so on.) which introduced challenges for us to consistently meet (and marked when **Jordan** and **Sam** paused using Capra, while **Will** has continued). In 2024, we resumed our meetings and discussions. This culminated in all members gathering in person for two six-hour meetings in late 2024 to engage in a retrospective summative exchange to discuss our summative impressions and the visual-textual narrative vignettes that we felt best represented our individual and collective experiences. These final meetings were used to align the thematic structure with concrete narrative vignettes and image selections: we revisited each theme in turn and selected episodes that best exemplified it across our different archives. Discussion about the finalized vignettes continued in 2025, and the paper was completed in summer 2025, with all team members collaboratively reading, writing, and discussing it.

In the Findings section that follows, we present a set of visual–textual, first-person vignettes. Building on recent work that uses vignettes to convey situated experience and analysis (e.g., [24, 25, 27, 142]), we treat these not as raw "moments" but as crafted, analytic condensations of our corpus. In our study, vignettes are first-person narrative accounts of a scene that are written to evoke the experience of being there, while also condensing that experience into a readable text that can support analysis. Each vignette we present was carefully selected because it concentrates a broader set of observations associated with a particular theme and was iteratively written and revised in light of our thematic analysis and group discussions. They help make visible how shifting encounters with Capra intersect with changes in hiking practices, human–nature relationships, and senses of self. At the same time, we acknowledge that vignettes are necessarily partial and exclusionary accounts that foreground some relations while leaving others less visible, and we invite readers to be mindful of these limitations alongside the contributions they enable.

4 Findings

Building on this vignette-based approach, we do not aim to provide an exhaustive account of our individual experiences with Capra, nor do we document every encounter we had with it. Instead, we focus on pivotal moments and summative reflections that shaped how we related to our self-made Capra archives over time. Our experiences are presented as retrospective narrative vignettes paired with supporting images in figures. Unless otherwise noted, all images are taken from our personal Capra archives. We invite readers to closely engage with the journal entries and visuals in each figure. The first two sections describe initial frictions with Capra and how our perspectives evolved as our hiking data accumulated. The final two sections offer broader summative reflections on how Capra mediated our sense of connection to nature and captured particular life histories and stories that surfaced over the years.

4.1 Early Experiences: Attuning to the Place and Role of the Collector in our Hiking Practices

From the outset, the Collector became part of our hiking routines—packed alongside other gear, affixed to a backpack strap, and carefully handled post-hike before journeying home. One of the earliest patterns we noticed was a shared impulse to intentionally "capture" key moments. We found ourselves enacting prolonged stances—at times with unusual body postures—in attempts to ensure that specific scenes, people, animals, or other natural phenomena were captured via the Collector before we moved on. In these early months, we were not simply "wearing" a device but learning what it meant to hike as someone responsible for future archive of oneself outdoors in nature. Thus, it quickly became evident that the Collector's presence was not entirely *unobtrusive*. For example, **Jordan** described instinctively shifting their stance to better frame a striking vista and lingering long enough to increase the likelihood that it would be encoded in their Capra archive (Figure 6).

As the Collector shaped our attention and physical movement in nature, uncertainties emerged around what exactly had been captured and what it would look like when revisited. These early experiences generated a sense of anticipation and curiosity, that was only able to be satisfied after returning to home, transferring the hike data and then by locating specific moments within the Explorer to 'see' how they had been captured. Here, we were repeatedly confronted with a gap between the self who paused on the trail to 'make' a record of a moment, and the later self who would meet that moment again in the archive. When we were able to revisit recent hikes in search of intentionally captured moments, the results were mixed. There was often a fleeting moment of satisfaction in having located the moment, paired with the immediate realization that most of these photos were lacking in terms of quality and composition when viewed statically, in isolation from the large sequence of photos that comprised each hike (e.g., over 2000 photos for a 3-hour hike). This experience is well captured through **Will's** (Figure 7) and **Sam's** (Figure 8) reflections on encountering memorable wildlife.

Will's reflection of a bear encounter illustrates how obtrusive the Collector could be in our early periods of use—it distracted them from being present in their experience, guiding them off the trail to capture an unexpected wildlife encounter, and diverting attention toward the operations of the device itself.

Here, the desire to be a 'good' user of Capra temporarily displaced the desire to be a present hiker on the trail. Yet, this proved to be a useful point of reflection for calibrating expectations of what the Collector can do and provided them with an important realization around being more 'open' and less concerned with what

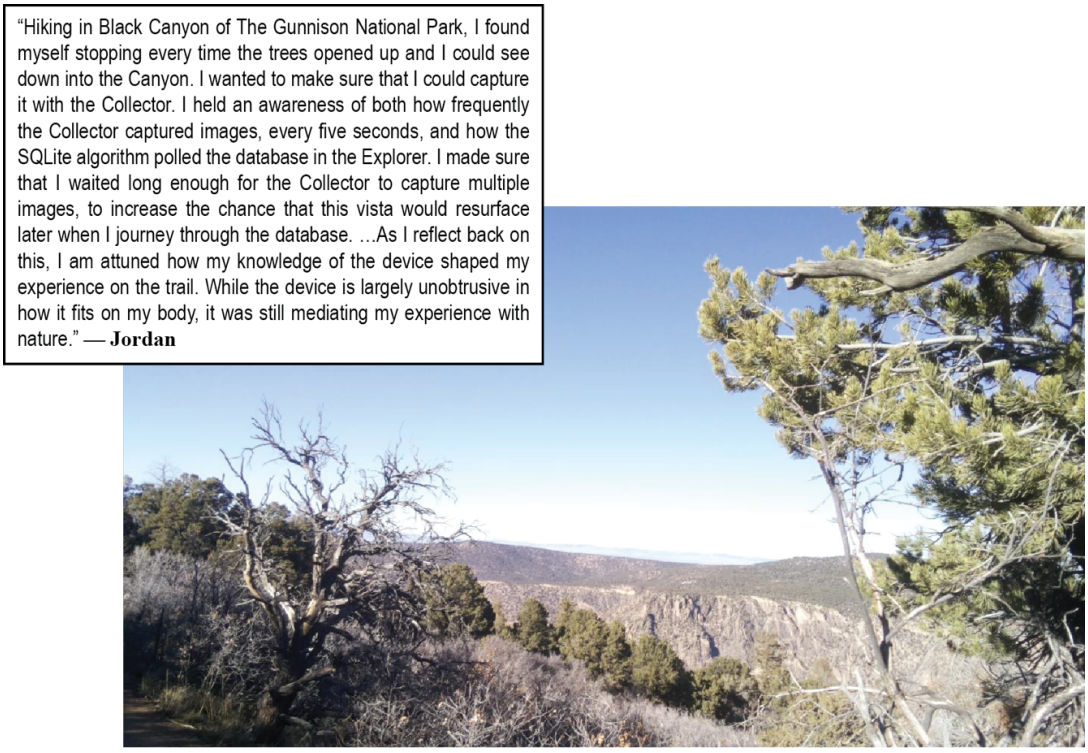

Figure 6: Black Canyon of the Gunnison National Park, as captured by Jordan's Capra Collector. Jordan's tacit knowledge of the Capra's internal workings influenced their hiking—they knew how long to hold their body pointed towards a view, to increase its chances of surfacing later.

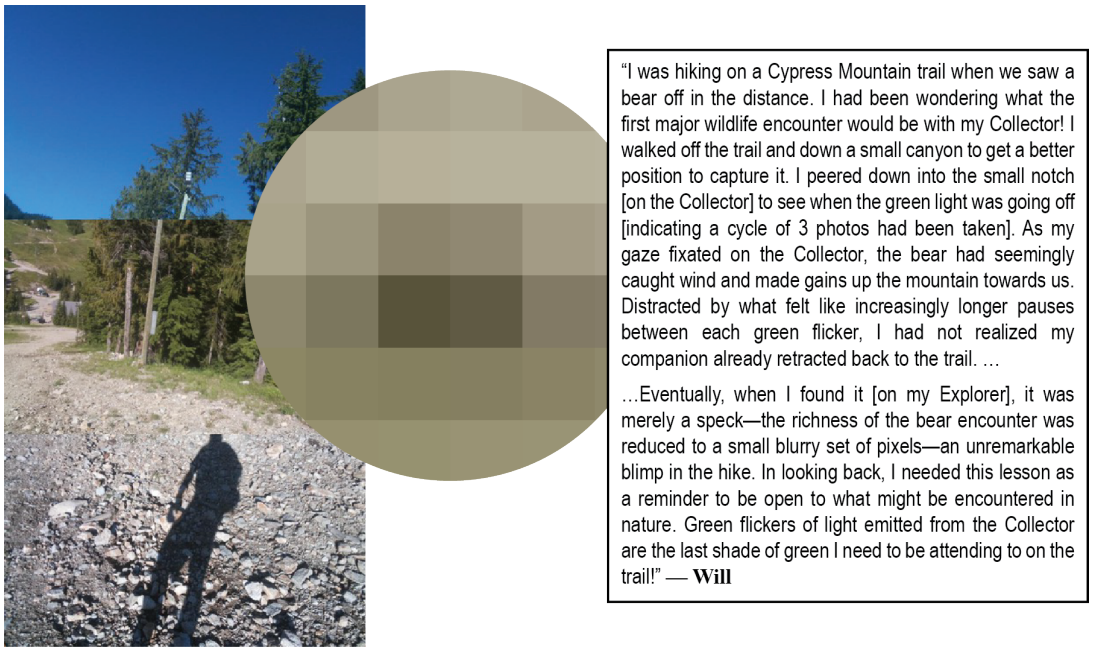

Figure 7: Will's Multi-PoV image from an early hike with Capra in Summer 2020 on coastal mountain trail in British Columbia shows a nearly imperceivable bear captured in the far left portion of the central photo (and magnified at 2000%). This illustrated an early lesson where Will was distracted by the technical workings of the Collector to capture the uncapturable.

"I took the Collector on a trip to Hornby Island with a group of friends. We had been joking for some time that capturing images of whales with the device would be iconic. While hiking, we spotted whales just off the coast moving in parallel with us. In a scramble, I tried to film them with my camera, and capture them vwith the collector—neither worked. When I later found the images on the Explorer, they were tilted and blocked by my camera. …

…However, years and many hikes later, this image now serves as a memory touch point. When it emerges on the Explorer, I am no longer disappointed. I am taken back to the specific moment, and the entire trip. As I have continued to use Capra, it has become less obtrusive, perhaps as I've accepted it is designed for the journey not the 'destinations' along the way." — **Sam**

Figure 8: Sam was hiking on a coastal trail in the Summer of 2020 and attempted to capture the whales that breached just off the shore. The whale can be seen in the top image, in the cap between the camera and the hand.

could or should be captured by the Collector. **Sam's** example of spotting whales foregrounds the importance that time played in recognizing the nuances and value in the durational quality of hiking data captured and expressed by Capra. An initially disappointing experience was transformed into a memorable early 'touch point' in **Sam's** hiking data archive as years of intermittent use accumulated.

Collectively, the examples in this section highlight that, despite key efforts to ground the design of the Capra Collector in the concept of unobtrusiveness, on a practical level the Collector was highly present in our hikes, shaped our movement to certain degrees, and mediated our attentiveness to nature. In this early phase, the technology had not faded into the background; instead, it reconfigured how we positioned ourselves in relation to vistas, companions, and imagined future experiences of our own data. These initial impressions gave us pause. Tensions surfacing from people's expectations not initially being met with technologies designed to subtly operate in the 'background' of lifelong practices are well documented in prior research (e.g., [44, 94, 96, 97, 136]). Although we were aware of these works and, indeed, we knew of Capra's design qualities, our firsthand experiences made clear that time would be needed to become attuned to its place in our everyday lives. It took time for us to understand how the rhythm of interaction that spans hiking data *collection* and *exploration* fit into our practices on the trail and at home. Crucially, these early encounters seeded later shifts in human–nature relations and self-understanding: from striving to capture and control particular moments, toward accepting Capra as a slow, fallible archive in which our trajectories as hikers, companions, and ecological subjects would gradually take shape. The following sections trace how this role continued to evolve as hikes accumulated and our lives changed.

4.2 Evolving Insights as Hikes Accumulate in Capra: Wayfinding, Noticing, & Making Space for Pause

Next, we detail how key design qualities of Capra shaped our experiences of re-encountering hikes and, in this, prompted alternative forms of wayfinding through our personal, self-made data archives. We focus on a series of narrative vignettes that illustrate the most salient examples capturing how Capra led to unique explorations in and around hikes that spanned geographic locations, altitudes, spectrums of color, and times of day. Across these examples, the Explorer's metadata lenses (time, altitude, and color) do not simply organize data; they participate in reorganizing how we understand ourselves as hikers, companions, and ecological subjects over time. In particular, they link retrospective comparisons in the archive to new forms of anticipation and noticing on the trail.

4.2.1 Extending Engagement with Nature: "Becoming Watchful". As our archives of hikes grew, and revisiting hikes on the Explorer became a regular practice, interacting with the device provided a catalyst for reflecting on and, in some sense, deepening our engagement with the nature ecologies we had hiked through. In line with our earlier discussion of "becoming watchful" (section 2.2), we understand these shifts not simply as noticing more things, but as cultivating an ecological sensibility: a way of seeing oneself as entangled with soils, seasons, companions, and places, rather than as a detached observer moving through scenery. For **Will**

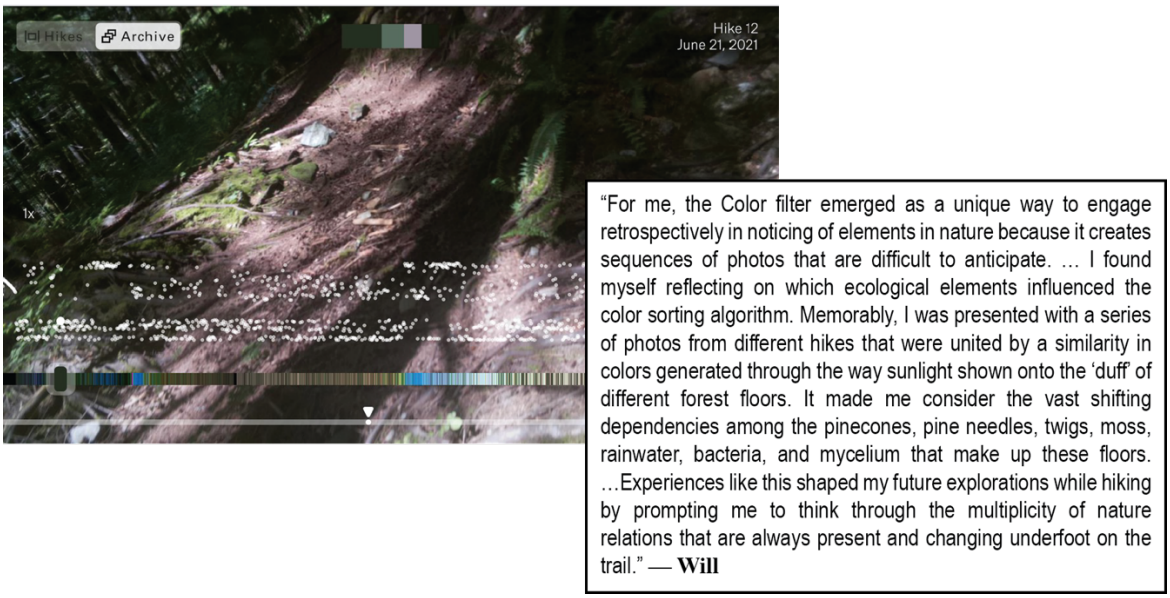

Figure 9: Will Reflects on unexpectedly finding themselves numerous times in the 'duff' of Pacific Northwest rainforest floors around British Columbia as the combination of Archive mode + Color Filter sequenced together various moments in regional hikes across two years of summer seasons.

this crystalized in their second year of using Capra (summer 2021), when the Color filter collated a sequence of red-brown images of the forest floor together that spanned seasons of hiking (Figure 9). Here, the Color lens afforded a form an ecological wayfinding that cuts across individual hikes, drawing together scenes that **Will** would not otherwise have grouped and re-encountered. Over time, this metadata mediated view of the forest floor contributed to a more relational ecological self—one that was attuned to underfoot assemblages and their ongoing changes, rather than only to vistas and destinations. As their archive grew over multiple years, the presence of altitude metadata also emerged as a lens to critically reflect on the cyclical nature of the seasons, as **Will** discovered places in the archive where repeated hikes intersect (Figure 10).

In this case, the Altitude lens stitched multiple selves together along the same trail over time—oscillating between seasons and life moments. Rather than stabilizing a single snapshot of place, it foregrounded cyclical change and positioned **Will** within a longer temporal rhythm of the rainforest, in contrast to the desire for order and stability at home. Hikes interconnected through similarities in altitude continued to surface as a highly significant quality of Capra. For **Jordan**, this emerged as a resource for noticing and reflecting on ecological differences among altitudinally similar, yet geographically diverse trails. Here, they reflect on encountering sequences of hikes woven together around 2000 meters that crosscut locations in the Northern Canadian Yukon, glacial lakes in British Columbia, Mount Rainier near Seattle, and California's southern Sierra Nevada Mountain range (Figure 11).

Jordan's narrative shows how noticing altitudinal and geographical factors can reveal productive ways of attending to ecological similarities and differences. Key to this emergent recognition was re-encountering serially interconnected first-person images of traversing places on various trails one step (or image) at a time. Here, the Altitude lens afforded a comparative, felt understanding of how different ecologies manifest at comparable heights, and it pulls earlier, pre-Capra hikes into view as imagined but potentially missing relational segments of the archive. This galvanized a unique, situated way of knowing and feeling for **Jordan** that shaped how they attended to other altitudinally influenced ecological factors 'moving forward' in future hikes. This experience also prompted retrospective reflections on significant hikes previously undertaken at different locations in years prior to having Capra, and how these experiences could have been relationally woven into the archive. Similarly, For **Will**, altitude data from recent hikes evoked memories of hikes taken earlier in their life. Yet for **Will**, the largely "level" nature of their own Capra altitude data prompted a different kind of contemplation—one grounded in current physical reality which prompted reflections on mortality (Figure 12).

Will's introspective reflection on their altitude data—interpreted as a marker of mortality—offers a poignant example of how long-term use of Capra opened up opportunities for deep personal reflection. It illustrates how a hiking practice can become a broader lens into one's life, as issues of mobility, place, and life stage become entangled and made visible through Capra's ability to materialize increasingly personal hiking data. In this case, the Altitude lens destabilized an earlier self-image as a high-altitude hiker and made visible a new, more constrained life configuration as a parent during a pandemic. Over time, Capra's archive transformed into more than just a collection of trails; it became a record of embodied change and continuity.

Figure 10: Will reflects on the intersection of images from the same hike in different seasons.

Figure 11: Jordan considers the relationship between their various higher-altitude hikes captured with their Collector, and the hikes they went on before Capra—and their developing attunement to nature.

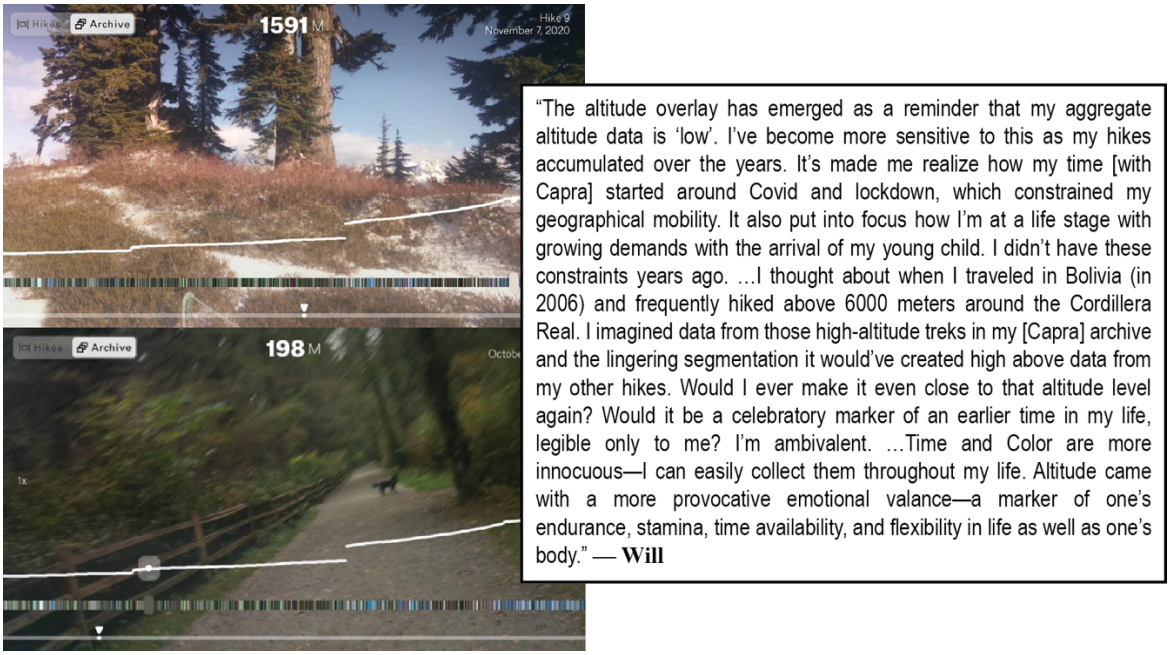

Figure 12: The small range between lowest and highest hike captured on their Capra, causes Will to reflect on their mortality.

4.2.2 Emergent Ways of Navigating and Creating the Personal Archive. The example below illustrates how an unexpected interconnection between time and altitude emerged as a productive resource for orienting through hiking data (Figure 13). While not initially legible, over time **Jordan** developed a way to reflect on patterns across hikes that occurred at similar times of day and at varying altitudes. Discrete markers—or "signposts"—of altitudinal change began to function as both navigational cues and triggers for anticipation and contemplation. As these experiences accumulated, they gave rise to **Jordan's** evolving practice of paying attention to the interplay of light and altitude at the trailhead before starting a hike. This practice persisted beyond any single use of Capra, reshaping how they anticipated upcoming hikes and imagined where new data would 'land' in their archive.

Here, metadata-based comparisons operated in multiple ways. Retrospectively, they helped **Jordan** understand how past hikes are woven together; and, prospectively, they fostered a habit of imagining new hikes as future lines in a "web of space and places." In this way, the Explorer's lenses scaffold a form of self-organization in which the hiking self is continually situated within an expanding, altitudinal–temporal map.

Both **Will** and **Jordan** independently began manipulating the Collector to create intentional "signposts" within their archives. They developed a practice of temporarily removing the Collector from their bodies while it was recording, placing it in a fixed position to capture a particular scene or event. These improvised actions introduced distinct pauses in the durational playback of hikes within the Explorer. They shifted the perspective from first-person hyperlapse photography—embodied movement through space and time—to third-person timelapse photography—a disembodied recording of a static scene unfolding over time. **Jordan** used this technique to create vivid markers of social memory, capturing moments of hiking and dwelling in nature with others that became embedded in their archive (Figure 14).

In contrast, as **Will's** interest in the bacterial and mycological inhabitants of Pacific Northwest rainforests grew, they increasingly interjected 5–15 minute timelapses into hikes to notice and attend to elements that supported these ecological niches (Figure 15).

These three examples highlight emergent ways of navigating, interpreting, and shaping personal hiking data archives as they evolved over time. They illustrate how the Explorer's interaction design—though not always intentionally directive—prompted personal and situated understandings of the data. Each example demonstrates how different improvised practices were developed to embed personally significant waypoints in the archive by interweaving timelapse sequences into the broader hyperlapse-generated dataset. For **Jordan**, timelapses appeared as flat lines in the Altitude filter, while for **Will** they manifested as solid blocks of color in the Color filter. While **Jordan's** motivation was to mark socially meaningful moments of hiking and dwelling in nature, and **Will's** intent was to document ecological phenomena, both approaches contributed to increasingly personal, expressive, and unique archives. In doing so, they also stabilized particular versions of self—**Jordan** as part of a socially bonded hiking collective, **Will** as an attentive observer of microscopic forest life—that continued to shape how they related to others and to more-than-human ecologies beyond individual hikes.

Collectively, this section has shown how, as the authors' archives of hiking data accumulated, they became more attuned to exploring and navigating them in individually meaningful ways. Over time, Capra not only deepened their engagement with nature but also opened up new avenues for reflection on their hiking practices, life experiences, and evolving relationships with their personal

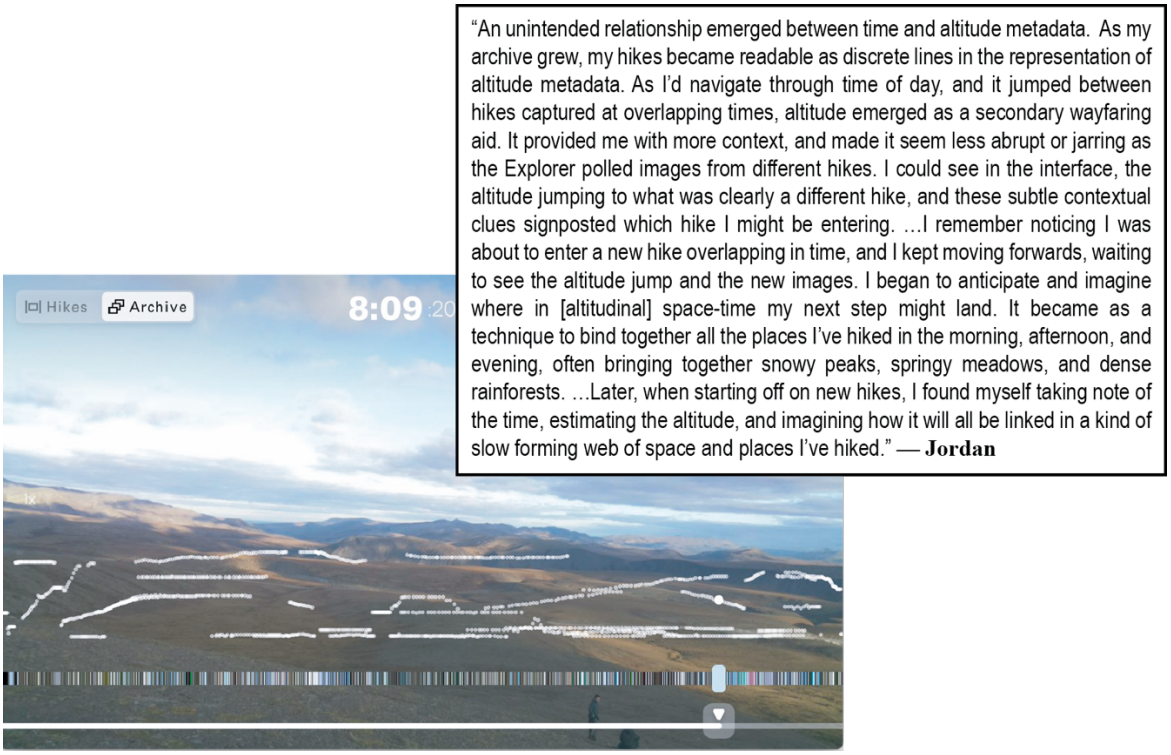

Figure 13: The distinct altitude separation in the Explore UI while in the Archive + Time filter emerged as an unexpected wayfinding tool for Jordan.

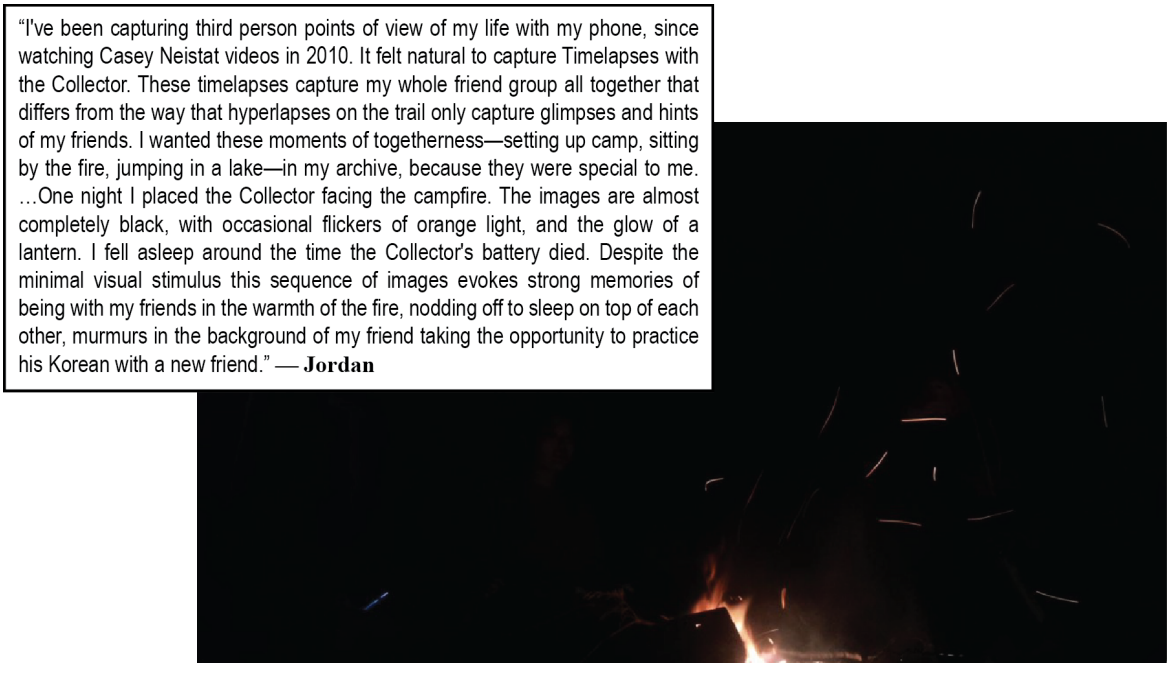

Figure 14: Even images with only small amounts of visual detail serve as prompts for memory for Jordan. Set on the ground to record friends at a campfire, the Capra Collector captures mostly darkness, except for some sparks from the campfire, and a distant streetlight.

Figure 15: Will used their Collector to capture various timelapse sequences of the rainforest floor.

archives. Crucially, the Explorer's metadata lenses afforded forms of comparison that linked past and future hikes, stabilized some aspects of identity while unsettling others (e.g., altitude as a proxy for bodily capacity), and fostered new practices—such as anticipatory prospective reflections at the trailhead, soil-focused pauses, and intentional timelapse markers as social waypoints—that persisted even as Capra itself faded in and out of active use. In the next two sections, we step back from these specific practices to reflect more broadly on how Capra reshaped our human–nature relations and the particular "kind of remembering" it invited over several years.

4.3 Retrospections on Capra's Roles in Shaping Human-Nature Relations and Attentiveness

In this section, we shift from vignettes that illustrate key insights gained through using Capra to retrospective reflections captured at the conclusion of our multi-year project. These reflections explore how our collective experiences with Capra shaped what and how we noticed aspects of nature. Long-term engagement with Capra—especially the iterative revisiting of hiking data through the Explorer—fostered a heightened sensitivity to subtle changes in the environments we moved through. Across these accounts, it is not only that we "noticed more," but that our ways of orienting ourselves shifted: the archive gradually reconfigured what counted as salient on the trail, how we positioned ourselves within ecological systems, and how we related current hikes to earlier ones. This shift marked a transition from passively "seeing" landscapes to actively "noticing" the nuanced details of nature. **Will** reflects on how their cumulative experiences with Capra became a touchstone for cultivating a deepened practice of attentiveness to nature while hiking. Their narrative centers on a 2024 outing to a familiar local trail in British Columbia—one that began with the realization that they had accidentally left their Collector at home (Figure 16).

In **Will's** account, forgetting the Collector exposed how its ways of seeing had been internalized. Years of revisiting hikes through the Explorer's lenses—looking up, down, and across time—have been folded into a new hiking self that now reproduces these movements of attention without needing the device to be present. The "Capra-informed" gaze persisted on the trail, even as the technology temporarily recedes, illustrating that the archive has helped reorganize how **Will** understands their own position within layered ecological timescales. **Sam** also remarked on the way that nature is captured archivally on the Explorer as well as held in memory. In their case, this mediating effect provoked reflections on ecological change and confronting climate change as images of a hike from previous years presented a different reality from their present experience (Figure 17).

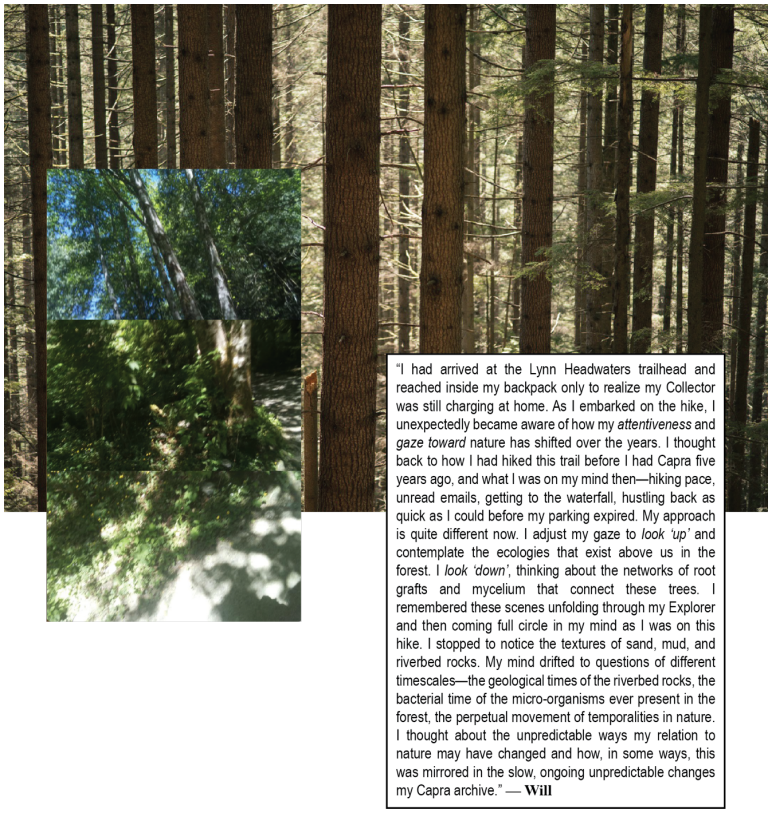

Figure 16: Forgetting the Capra Collector prompted Will to consider how their relationship to hiking and noticing has changed. The first image shows light filtering through the trees in Lynn Headwaters, and the second image is from the Capra Collector on a later hike in the same area, when Will remembered the device.

Figure 17: This image is from Sam, taken in the Summer of 2023, while returning to hike Elfin Lakes, prompting reflection on the passage of time, the changes in seasons, and climate change.

"When I was hiking in Big Sur, the scale of the old sequoias was stitched together across the Collector's upwards, level and downwards lenses. In the tundra of the Northwest Territories the downwards facing camera drew attention to the reddy-oranges of lichen and hardy plants fighting to survive in the arctic soil, while the other lenses were filled with blue skies.

When I revisit my hikes, scrolling through images, or letting them play out one by one, they are spliced together, intersecting time and space from the Canadian arctic to the American mid-west. The images are not boxed into folders and subfolders, or sealed in albums, they are dispersed into and through each other. The images from the tundra and the deep forest collide and, as I compare them, I become aware that it is not their altitude that shapes their differences, but their latitude. I feel how they are connected. I have developed an appreciation for the whole of nature that I have traversed.

I have grown to realize that this interconnectedness is an affordance of the Collector, and at the heart of the Explorer. Through this window I have started to notice, in a piecemeal way, connections across sea levels and latitudes, ecosystems and ecologies." — **Jordan**

Figure 18: The old sequoia trees span multiple panels of the Capra images. Jordan reflects on their understanding of Capra's quality in supporting attending to ecological elements in new ways.

For **Sam**, the Explorer's repeated resurfacing of a "keystone" hike across filters created a stable mental template of the trail's trajectory. When the 2023 hike diverged from that representation—no snow line, hazier views, more smoke—the discrepancy was confronting. Here, the archive did not simply preserve a past experience; it actively shaped **Sam's** perception of environmental change in relation to glacial retreat and wildfire smoke, entangling personal hiking history with broader planetary precarity.

Jordan's retrospective reflection centers on their growing, situated understanding of how Capra's emphasis on the interconnectedness of images—captured through and across hikes—developed in parallel with their shifting perspective on the interrelatedness of nature itself (Figure 18).

Jordan explicitly linked the design of Capra to a changing sense of the natural world as an interconnected whole. The Collector's three lenses first stretched individual trees and tundra scenes into vertical compositions; later, the Explorer's refusal to "box" images into folders caused hikes from different regions to collide. This 'collision work' gradually reorganized **Jordan's** sense of self from a series of discrete trips to a situated body moving through a continuous mesh of latitudes, sea levels, and ecosystems.

Collectively, these summative accounts of years spent with Capra across team members help capture how their respective relations to nature shifted over time—from holding memories of significant sequences of images and perspectives from past hikes in mind when actively hiking to recognizing the complex interconnected qualities across ecological systems we navigated on the trail. In each case, specific design qualities of Capra—the three camera angles, the metadata-based filters, and the interconnected and evolving archive—do more than document experience: they provide concrete structures through which new ecological sensibilities were rehearsed, compared, and eventually taken up in how we hiked with and without the Collector. Through prolonged use of Capra, team members moved beyond a focus on capturing grand vistas, toward a deepened appreciation for subtle, intimate details in the environment. Even moments of absence—such as forgetting the Collector—revealed how their ways of noticing and attending to nature had fundamentally changed. These experiences reflect a wide range of personal interpretations of hiking data, encompassing diverse ecological observations: from noting changes in natural phenomena and the timescales they inhabit, to recognizing signs of environmental precarity, including the haunting possibility that some landscapes may eventually only exist in one's Explorer. Taken together, these retrospections suggest that Capra did not merely amplify existing habits of attention, but participated in reorganizing

our sense of self in relation to forests, glaciers, soils, and climates—expanding who we understood ourselves to be as hikers within more-than-human worlds that comprise the trails we traversed.

4.4 Retrospections on Capra Evoking a 'Certain Kind of Recollection of the Past' with a Personal Archive

The research team was aware that the design and intent of Capra largely centered on capturing one's experiences hiking and dwelling in nature from a highly personal and individual perspective. Considering that hiking can be a social practice, we knew that this would likely involve also capturing the presence of fellow hikers and hiking companions to differing degrees over the years. Because the Collector operated in the background at a fixed interval, with very little interaction required once it was turned on, it supported a low-effort accumulation of images over many hikes. However, we did not anticipate the extent to what would be captured nor the range of emotions, memories and associations that would end up in our respective archives of hiking data. Major life events and shifting relationships became folded into the archive not through deliberate tracking, but because they happened to coincide with times when we were out on the trail with Capra running in the background, in addition to period when Capra was not in use. In this section, we reflect vulnerably on the durational aspect of using Capra over several years, and how it provided windows into aspects of our past selves and current life situations that reached far beyond solely dwelling in nature. **Will's** reflection captures how their Capra archive became increasingly *personal* through the momentous and prosaic moments that it managed to capture, in addition to the unexpected significance of 'gaps' in the archive (Figure 19).

Here, long-interval background capture meant that life events do not need to be explicitly "logged" to become part of the archive: they arrive as incidental details on the periphery of hikes. At the same time, stretches of non-use materialized as temporal gaps that were meaningful, prompting **Will** to recall off-trail events (early parenthood, pandemic years) that the system never directly recorded. Together, these sparse traces and conspicuous absences

"A surprising number of changes in my life have found their way into my Capra archive. A marriage proposal while mushroom foraging on a hike; dogs becoming older and greyer; a new little person appearing on the trail; close friends that were in a relationship that is no more. Although the traces of friends, family members, life events and places are rare when considering the sheer amount of photos in my archive, they feel highly present, even confronting sometimes. I'm reminded of a sequence of two images my Explorer juxtaposed—a mundane photo of a woody trailhead in the early pandemic [in summer 2020] with a glimpse of our beloved dog's tail whom is now no longer alive, followed by my young child walking on an elevated trail boardwalk from a hike [in summer 2024]. So much happened in between the years these two frames link. The mental weight of this transition continued to reverberate well into the many images of forests that followed.

…The gaps in my time spent hiking over the years have been strangely significant. As I became a father, there was considerably less time to get outdoors, and I have far less data from this life stage. I didn't see those gaps as negative, more as markers of change—they even conjured up memories that took place off the trail. …My Capra data has taken on a new definition of being 'personal data'. It stands as a unique record of my life, both on and off the trail, that seems 'readable' only to me. Extremely mundane and extraordinary experiences are captured, in ways that falls somewhere between intentional and implicit. It made me wonder not only what hikes will intersect with my current archive in five or ten years, but also what stories they will 'tell' about my life in the future." — **Will**

Figure 19: Will reflects on the qualities of an archive that is so personal it can only be read by the creator.

supported a particular way of recollecting in which the archive was deeply personal yet only partially legible—something that stabilized one version of self while leaving much to be inferred.

While we found that our respective Explorers contained archives rich with personal memories, it became evident that the design of the system does not account for the context or semantic value of those memories when surfacing them—only the underlying data in which they are encoded. As **Will's** reflection illustrates, this design quality could be deeply evocative. However, at times, it also led to moments of awkwardness or discomfort, particularly for **Sam** (Figure 20).

Sam's account highlights a different consequence: the Explorer's metadata-driven resurfacing brought back emotionally charged relationships with no way to modulate or mute them. Because Capra treated all images as equal data points, images of a now-distant friend appear unexpectedly, interleaved with mundane trail scenes. This cross-cutting can destabilize the present self by pulling earlier relational configurations into view at moments the system deems appropriate, rather than when the person feels ready to revisit them. Yet, precisely this lack of semantic sensitivity also can create occasions for difficult but generative reflection on how one's life has changed.

For **Jordan**, their archive encapsulated a distinct and bounded period in his life—with a clear beginning and end—prompting him to grapple with whether to continue adding to it or to preserve its sanctity by letting it remain as is (Figure 21).

For **Jordan**, Capra allowed an entire life phase—graduate school, new friendships, specific places—to be documented without a deliberate project of life logging. When their use of Capra slowed and then stopped, the archive took on the quality of a bounded time capsule, suspended between the possibility of being extended with future hikes that might overwrite and complicate its clean associations, and the appeal of leaving this version of self purely preserved in the existing archive.

Our individual archives grew to become a possession that had real value. They encapsulated significant life events, whether they were captured in photos in the Explorer, or hinted at through memory markers, and even periods of non-use. Yet, this value was tempered with challenges that came with such a personal archive that can easily and unexpectedly crosscut many emotions, associations, and life stages—whether through presenting extraordinary life stage transitions intermingled with mundane forest photos, conjuring up complex feelings about relationships no longer intact, or provoking ambivalence around whether it's the right decision to crystalize a time in one's life captured through personal data by deciding to never add to it again. Taken together, our experiences show how a system designed to document hiking can become an incidental way for friendships, family, health, and life stages to slip into the archive—unplanned entanglements that both stabilize versions of who we were and, at times, unsettle who we understand ourselves to be now.

"I formed an incredibly close friendship at the beginning of the pandemic, that was only documented through the hikes with the Capra Collector. The images in the archive remain one of the only tangible touch points that triggers memories to this period of my life. These images are fleeting—an occasional image of their back in the distance. The Explorer's filters don't attach semantic meaning to the images; it doesn't respect the memories that the images may trigger; or the way that they intersect moments of my life in ways that make me uncomfortable. It is uncomfortable, but I also see it as valuable. This cross-cutting of memories prompted me to reflect on the changes in my life." — **Sam**

Figure 20: Summer 2020, on the Sunshine Coast. BC. Sam reflects on how the Explorer resurfaces images that prompt memories from the past, without a consideration of their context, or the present context.

"My experience of moving to [city in Western Canada] for grad school is captured on the Capra Collector and lives on within the plastic shell of the Explorer. I captured the beginning of multiple friendships, our first hikes and camping trips together. It is an intermixing of relationships, grad school, work, locations, markers of people, and hikes. It is a time capsule of the last four years. It serves as a small window into my life, in a way that has become deeply meaningful to me. Thinking to the future, I imagine capturing new data, and speculate on how it might overlap and intersect through this time of my life. I don't know if I will continue to use the Capra, capturing the next stage of my life, but muddying the associations written in the metadata, or do I leave this time capsule as it is." — **Jordan**

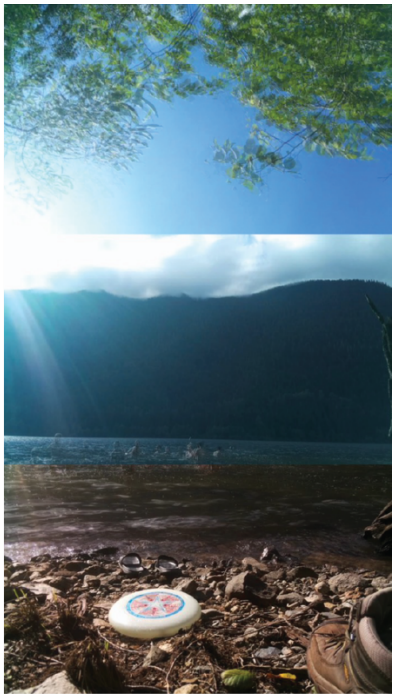

Figure 21: Jordan captures a timelapse of their friends swimming in a lake. Their archive of images is bounded to a specific period of their life, and they grapple with whether they should continue to add to it, or leave it as a time capsule.

5 Discussion

Up to this point in the paper, we have presented key narratives that capture our lived experiences using Capra across varying timespans, paces of interaction, geographic contexts, and life stages. Our work is grounded in a critical exploration of how personal data and technology might shape one's evolving relationship with hiking, nature, and the self over time. We detailed how our expectations about Capra's role while hiking were recalibrated, and how extended use (and moments of non-use) surfaced shifts in our perspectives on ourselves, our life histories, and the natural environments we moved through over several years. Taken together, we approach Capra as a slow, multi-perspectival form of documentary informatics: a system that produces a metadata-centered record of hiking that, over time, actively participates in reorganizing how we understand ourselves in relation to the trails, ecologies, and life stages it intersects with. Next, we reflect on these experiences to consider their implications for designing technologies that aim to be unobtrusive in the wild and to foster human-nature connectedness and relationality through subtle, accumulative, and evolving interactions. We further examine the potential for designing systems that enable the generation and exploration of personal data archives that grow and transform alongside lifelong practices, such as hiking. Through these critical reflections on our long-term engagement with Capra, we propose opportunities and issues for future HCI research and practice.

5.1 Attuning to Unobtrusiveness & Making Time for a Longer-Term Interaction Model

Prior research [5, 49, 50] has emphasized *unobtrusiveness* as a central concern when designing technologies that are embedded in and shape human-nature relationships. Yet, few studies have translated this concept into actionable design practice, and even fewer have examined "the balance between supporting (or mandating) non-use of technology with the potential benefits of technology use" [49:7] over extended periods of engagement. We wanted to understand how the Collector might realize this conceptual goal when used repeatedly across multiple years of hiking.

Then, to what extent was the concept of unobtrusiveness useful in Capra's design? While the Collector's form aimed to minimize interaction complexity, this alone did not render it unobtrusive. Rather than understanding unobtrusiveness as conceptual means to make technology "disappear", our experience points to a more generative interpretation: treating unobtrusiveness as a relational and temporal quality that is actively shaped through sustained situated use and changing life circumstances. Through cycles of hiking, capturing, pausing, and revisiting, the Collector became increasingly assimilated into our personal practices. Over time, its presence faded into the periphery—not because it was imperceptible, but because it became interwoven with our ways of being on the trail. Early on, it clearly choreographed our movements and shaped where we stopped, looked, and posed. later, it receded into a background role, even as our respective personal data archives continued to influence how we anticipated and remembered hikes. This process of becoming attuned highlights that unobtrusiveness

is not a fixed trait of the technology but a negotiated outcome between device, practice, and evolving selves. Reframing unobtrusiveness in this way shifts its potential value from supporting distraction-free experiences toward enabling deeper relational and reflective encounters with nature.

Our findings contribute to ongoing HCI efforts to rethink mobile technologies in outdoor contexts (e.g., [5, 71, 105]) by validating a longer-term interaction model that supports noticing, recollection of the past, and ecological attunement through self-determined, evolving engagement. Capra's design fostered experiences of reflection and introspection not by enforcing detachment from technology, but by allowing interaction pacing and frequency to be shaped by individual preferences over time. Importantly, this interaction model also includes moments when the device is deliberately left at home or forgotten—those hikes also became occasions to notice how our orientations to nature and to ourselves had changed even without new data being captured. In this sense, unobtrusiveness also involves supporting intervals of non-use as key parts of the practice rather than treating them as failure or otherwise unhelpful.

While Capra's pairing of first-person photography with hiking metadata exemplifies one pathway into this model of interaction, other sensory modalities—such as soundscapes [119], sunlight [81], temperature [21], and soil composition [116, 117, 152]—hold similar potential. There is a clear opportunity to explore how such environmental data can be meaningfully integrated into design interventions that blend unobtrusiveness with long-term interaction. At the same time, our experiences suggest that such systems should not be present on every trail or in every situation: there are places and moments (e.g., sacred sites, sensitive wildlife areas, emotionally charged hikes) where the most appropriate form of unobtrusiveness is non-use. Thus, designing outdoor technologies for such contexts also entails articulating where the device should not be, and building in ways for people to put it aside easily—without feeling that they are neglecting, damaging, or distorting their archive. Future research could help further stabilize and diversify unobtrusiveness as a design concept, while advancing interaction strategies, design patterns, and methods that support nature-entangled technologies aimed at deepening human-nature relations [12, 49, 79, 133, 134].

5.2 Becoming Watchful of Human-Nature Relatedness through Different Perspectives

It eventually became clear to us that Capra supported and extended our practices of becoming more watchful in nature—moving beyond experiencing hiking as simply walking through nature, toward cultivating new "elements of attention, awareness, and intention" [111:9]. These shifts in nature relatedness were accumulative, emerging through how we incorporated Capra into our hiking routines and broader everyday lives. Central to this shift was the Explorer's interaction design, defined by its distinct yet interconnected time, altitude, and color filters. These features enabled evolving ways of seeing individual hikes and our growing archive as a whole. Rather than using the filters and underlying quantified data as objective measures for analyzing efficiency or performance, the color and altitude filters unexpectedly became unique lenses through which we noted and reflected on temporal and ecological interdependencies in the wild. They also supported improvisational ways of marking significant moments—by pausing during a hike to create disembodied timelapses, we inadvertently created altitude plateaus or color blocks that later became recognizable 'signposts' within our personal archives.

As our interactions with the Explorer accumulated, their reflective and interpretive effects extended beyond the device itself. In **Jordan's** case, encountering attitudinally similar but geographically distinct locations across time and space prompted feelings of recognition and awareness that carried forward into new hiking experiences. As our data grew, so did the interconnections between hikes, opening up retrospective opportunities to engage with ecological phenomena we might have otherwise overlooked. These ranged from comparisons of soil qualities in juxtaposed rainforest floors **(Will)**, to noticing climate change-driven ecological shifts **(Sam)**, to mapping entangled relations between distant landscapes **(Jordan)**. Capra also catalyzed prefigurative reflection while on the trail. We found ourselves anticipating how elements—sunlight qualities, rock or moss colors, textures of mud, or the presence of alpine flora—might appear within our Capra archives. In doing so, the Explorer did not simply direct our gaze toward specific objects; it gradually reorganized how we positioned ourselves within wider ecological systems, inviting us to read our bodies and life stages through indices such as altitude, color, and times of day (or night) rather than solely through clock time, calendar time or social milestones. This heightened attentiveness to ecological detail, evoking reflections on the "slow-forming web" of places, ecologies, and associations, making the interconnectedness of the natural world more perceptible over time. These findings reflect a "blurring of boundaries" discussed in recent work (e.g., [12, 84]), where non-instrumental technologically mediated interactions with nature can play valuable roles in diminishing the perceived separation between humans and their non-human surroundings.

In this way, our work offers a rare multi-year account of how the design qualities of *implicit slowness* and *interconnectedness* [95] can productively intersect in a system that fosters reflection and interpretation—subtly evolving alongside our shifting relationality to hiking and to nature. The forms of selfhood that emerge here are not purely athletic or purely narrative. Instead, they are organized around recurring encounters with specific trails, altitudes, colors, and seasons that together sketch who we have been in relation to particular ecologies. These findings point to opportunities for extending such design qualities into other outdoor practices the HCI community is beginning to explore, including birding (e.g., [12]), gardening (e.g., [113, 140]), phenology (e.g., [114]), and critical walking practices (e.g., [14, 21, 127, 153]). Our work also contributes to calls for technologies that teach new ways of seeing—ones that "encourage human awareness, reflection, and wonderment in the living world" [74]—and that help reveal alternative modes of watching ourselves in relation to the ecologies we inhabit [12].

To this end, Biggs et al. [12] note the inherent challenges in engaging with non-human perspectives and highlight the need for a multiplicity of approaches. While Capra is admittedly egocentric—worn on the body and oriented toward the human user—we found that shifts in perception and relatedness to nature were gradual and accumulative. Over time, the Explorer's metadata-based lenses reorganized our sense of self *through* the ecologies we moved with: color sequences foregrounding forest duff, mycelium, and soil made

it harder to think of ourselves as separate from the microscopic life underfoot; altitude-based juxtapositions across tundra, rainforest, and alpine trails made climatic differences and climate-change impacts (e.g., disappearing snow lines, smoky horizons) part of how we understood our own trajectories; and cross-cut hikes stitched together across time of day made companions, animals, weather, and vegetation feel like recurring co-participants in our lives. In this way, selfhood became increasingly articulated in terms of ongoing entanglement with specific places, climates, and more-than-human actors, rather than as an individual set apart from a neutral backdrop in nature. This points to opportunities for further exploring how such design interventions might support designers and researchers in the difficult but generative work of learning to recognize, relate to, and attend more carefully to the non-human actors with whom we cohabit the natural world.

5.3 Balancing Tradeoffs in Creating, Exploring & Living with a Self-Made Lifelong Personal Data Archive

Another goal of our work was to investigate the self-reflective and social dimensions of hiking as a lifelong practice, and to explore how a system designed to capture, revisit, and recollect life experiences on the trail might fit into our lives. Drawing inspiration from prior work (e.g., [20, 96, 97, 100, 107, 145]) that mobilizes *slow technology* as a design-theoretic lens to examine the temporal and biographical qualities of personal data, we sought to understand what kinds of narratives might emerge through the occasional yet ongoing use of Capra across several years—and what meanings they might hold when retrospectively reviewing our hiking archives. Where diaries, photo albums, and conventional lifelogging tools tend to foreground explicit textual or visual content, Capra foregrounds metadata—time, altitude, color—as the primary organizing principle. In this sense, it exemplifies a form of documentary informatics in which the "aboutness" of the archive is produced as much by these interconnected and evolving metadata structures as by the images themselves.

Over time, we found that our Capra archives had expanded well beyond documenting hikes, becoming entangled with key moments in our social and personal lives. For **Jordan**, the archive came to represent a distinct life chapter: graduate school, a formative period soon to be left behind in pursuit of a professional career. For **Will**, the archive reflected a series of life changes, culminating in a new stage defined by parenthood, limited geographic mobility, and longer, identifiable periods of non-use. These long-term records also surfaced tensions and discomforts. At times, they exposed jarring juxtapositions, such as mundane trail footage interspersed with reminders of past relationships or major life events, that produced emotional dissonance. In other moments, they prompted unease: Would altitude data come to signal a gradual decline in mobility or health? Would continuing to add data to an archive saturated with memories from a particular life phase risk diluting its emotional resonance? When unpredictably encountering digital traces of a past relationship, to what extent should one continually honor it, or simply put it to rest? These questions were not present at the outset—they unfolded gradually, shaped by years of reflection. The Explorer's metadata-driven juxtapositions thus both stabilized specific versions of self (as belonging to a discrete life chapter) and, at times, destabilized them by forcing encounters with earlier selves and relationships at moments we did not choose. They highlight the deeply idiosyncratic, and often unexpected, ways that technologies for life-logging and personal reflection can evolve when integrated into everyday practices over the long term—even when centered on something as seemingly simple and benign as hiking.

On the one hand, a strategy to alleviate these tensions could involve building in support for the marking and segmentation of key portions of the personal data archive as it grows. This would allow users to temporarily partition specific memories or time periods from the larger archive via metadata modalities of time, color, or altitude. For instance, such interaction design features could have allowed **Jordan** to "time capsule" their crystallized life stage during graduate school while continuing to add new hikes. For **Will**, they might have temporarily hidden drastically different—potentially distracting—altitude patterns from earlier life periods, or, in **Sam's** case, isolated hikes shared with an ex-friend. Features like these could enable a lifelong archive to scale while reducing the emotional and interpretive frictions that can and do emerge over time. Such controls would also acknowledge that people sometimes need to curate which versions of self are most available in day-to-day encounters with their archive, without dismantling the underlying record.

On the other hand, records of precisely these kinds of complex, sometimes uncomfortable experiences are what add to the richness and depth of our life history archives. Thus, integrating partitioning features must be done carefully. Additionally, a key strength of Capra is that—aside from the labor of affixing the Collector to our body and uploading data to the Explorer—it required no active curation or management of personal data, an issue known to hinder long-term use [33, 77, 88]. Capra's integration of time, altitude, and color into a synthetic metadata framework enabled new hikes to fluidly interconnect with past ones in rich and often unanticipated ways, with minimal effort (aside from occasionally slow uploads). We found this evolving, yet intelligible design strategy supported a sustained sense of "wayfinding" [115] or "venturing" [55] through one's past via personal hiking data. This is where Capra meaningfully exceeds diaries or conventional photo collections: its metadata-based interconnections continually create new crossings between times, places, and selves that would be difficult to assemble manually, while still remaining grounded in the bodily experience of walking particular trails.

Collectively, our findings align with the original vision of slow technology while contributing new insights for future research. They demonstrate that creating, living with, and exploring a personal data archive—one that captures a lifelong practice through diverse sensing modalities—can give rise to rich, uniquely reflective digital records. These records require time to interpret and gain meaning as they become increasingly interwoven over time. At the same time, our accounts surface conditions under which such archives may not be desirable—for example, when emotional risks outweigh potential reflection, when others' privacy or expectations are at stake, or when people simply wish to keep certain walks unrecorded. This points to a compelling opportunity for future work to explore how technologies might be designed to materially manifest personal history archives that evolve alongside people

and their long-term practices. Yet, this will be complex. As our research shows, occasional yet ongoing interactions with personal data archives across extended periods are marked by unpredictable rhythms of use and non-use. Designing for such variability—while preserving the depth and interpretive richness of lived experience—will be a key challenge moving forward.

6 Conclusion and Future Work

Our research contributes to an intersection of growing calls in the HCI community to undertake research that (i) explore design initiatives that support diverse forms of recognizing and nurturing human-nature relations; (ii) extend concepts of slowness and temporality through longer-term research programs; and, (iii) resist objective, instrumental views of data in favor of alternative, situated expressions of data in everyday life. By documenting our use of Capra across seasons, years, and life stage changes, we offer a rich, first-person, long-term account that reveals nuanced interactions, tensions, and experiences that emerged over time. These insights would have been difficult—if not impossible—to uncover through short-term studies or without access to our intimate, evolving perspectives. One of the most striking realizations was how deeply entangled the research became with our personal lives and senses of self—something that is hard to anticipate or plan for at the outset of such a study. While long-term first-person approaches can yield uniquely rich and complex insights, they also demand careful consideration of the known and, potentially unknown, risks researchers may encounter in this space.

We also recognize the limitations of our approach, particularly in its reliance on our own experiences, positionalities, and perspectives. In future work, we plan to adopt more participatory methods that engage diverse communities of outdoor enthusiasts that have historically been overlooked both in outdoor spaces and in technology design (e.g., [38, 110, 124, 128, 135]). This will allow us to better understand their own situated experiences of hiking and dwelling in nature, as well as explore the roles that future design interventions may—or may not—play in supporting human–nature relationships and in reorganizing selfhood in relation to ecologies and more-than-human actors. Such perspectives will contrast with and extend the insights presented in this paper. In this work, we critically reflected on frictions, emergent insights, and retrospective interpretations of living with *Capra* over several years. We hope that our reflexive, first-person account, along with our discussion of opportunities and challenges, will inspire future HCI research to explore the potential—and limits—of technology in mediating our complex, entangled relations to nature, to others, to our data, and to ourselves.

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