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# Networked Living <sup>1</sup>

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**1.** Based on previous academic work of the author, titled *Silicone Valley. Breaking Techno-Mediated Habits* (Master's Thesis, Bauhaus - Universität Weimar and the University at Buffalo, 2018). Available at: <http://hdl.handle.net/10477/79433>

**As networked technologies pervade all aspects of daily life, they effectively reconfigure the ways we meet, communicate and act together. On closer inspection, these broader social and cultural shifts manifest themselves in our personal techno-mediated habits. This work uses such tech-based behavioral patterns to assemble a synoptic overview of networked sociability, its repercussions, and socio-spatial potential. The first chapter is concerned with how algorithmically-filtered online places inform the public discourse and urban space. The second chapter centers on the private sphere and the ways in which our increasingly sophisticated tools redefine the concepts of intimacy and solitude. Finally, this work assumes a critical design approach to imagine two speculative devices, Meetspace and Z-Shell – discursive objects that capitalize on our tech-fueled habit formation to suggest better practices for our media-infused future.**

# 1 INTRODUCTION

In these times of increasing interconnectivity, our profound interdependence on techno-spatial systems dynamically restructures everyday life, together with the small rituals and habitual practices that punctuate it. This work takes a closer look into this process by tracing the influence of our habit-forming technologies on our personal relationships, sense of self, and spatial experience.

The philosophical framework of this work rests on the enduring idea that humans coevolve with their technologies. The link between embodiment and technicity can be traced back to numerous tools that have “irrevocably changed the biology, culture, and cognitions of humans” (Hayles 2010, 154). In fact, to live, think and act constitute *embodied* processes which are “essentially and originally technical” (Hansen 2006, 78). The tight coupling of the body and its tools is a core theme in the work of many phenomenologist philosophers. For instance, Heidegger reflected on the experience of using tools – which perceptually ‘disappear’ during action and in doing so, tend to blur the distinction between the self, the tool and the environment (Heidegger 1927). On a similar note, Merleau-Ponty offered an in-depth analysis of various prosthetic extensions and their seamless expansions of one’s body schema (Merleau-Ponty 1945). While their affordances extend our agency, tools serve as mediums of thinking and action; they are a tangible means of making sense of the world. For this reason, this work adopts an understanding of cognition as *situated* or *extended*, whereby things and environments participate in the production of thought (Clark & Chalmers 1998).

In this light, the more our things become interactive and networked, the further they get involved in the ways we establish familiarity with the world through our *actions*. When these mature into habitual patterns, they are entangled with their specific devices and contexts, contributing to an ecology of *techno-mediated habits* that range from socially recognizable gestures and personal quirks to nervous tics and compulsive behaviors. Such habits are far from one-dimensional, deterministic behavioral responses to the affordances of our devices; they can be as complex as each of us and at the same time follow patterns as universal as the technologies that sustain them. Therefore, throughout this work, tech-based habits serve as a probe into the wider socio-cultural shifts that networked technologies domesticate in our life.

The following two chapters attempt to trace a suggestive map of networked sociability. Each of them is written as an episodic narrative that is more concerned with delineating the *relations* between its core elements, than analyzing their ever-changing details in depth. This approach was deemed appropriate because it accentuates the interdependency of subjects, objects, and habits, that networked living catalyzes. From a socio-political standpoint, the first chapter is concerned with the algorithmic segregation of virtual places and its consequences. It raises a series of pressing questions, such as how to establish shared experiences in a world of filtered content and tech-driven introversion; or, what kind of influence do networked social dynamics have on urban space and the public discourse. Focusing on the personal aspects of

networked life, the second chapter examines how concepts of intimacy and solitude expand to accommodate our artificially intelligent companions. Also, if the latter are increasingly taking care of our homes, what are the repercussions of this on domesticity and private life? Each chapter concludes with a vignette that extrapolates the present condition to introduce a speculative device that breaks, or makes, techno-mediated habits.

## 2 MEET THE OTHER: VERTICAL ENCOUNTERS

In the last couple of decades, the advent of mobile computing and social networking services has changed the way we meet and socialize in urban space. Networked devices mediate our daily exchanges and activities to the extent that the line between our online and offline social life has effectively disappeared. To describe this hybridization, Turkle used the term *multi-lif-ing* – or, as one of her study participants dubbed his seamlessly twofold reality: *life mix* (Turkle 2011, 160). For better or for worse, the way we perceive ourselves as individuals and members of society is conditioned by the specifics of our personal life mix.

Let us take a closer look into how the virtual dimension of our life mix is conditioned. For instance, most online search engines filter their search results to accommodate our limited time and attention resources. Yet, on what criteria is information deemed relevant or redundant? It is a common misconception that information technologies are inherently neutral, rational, and just. Sophisticated digital tools are often taken ‘at interface value’, while their computational complexity remains hidden. In the background, algorithms make elaborate choices, such as which data to collect, how to correlate and interpret them, and what kind of actions to extrapolate. Yet, as everything manmade, algorithms are assemblages of judgments that are contingent, subjective, and potentially biased.

Similarly to search engines, most major social networks use predictive analytics to curate their content to each user’s taste – extrapolated from past activity on the platform and quantified according to numerous parameters, such as the frequency, quantity, and kind of engagement with other users or entities<sup>2</sup>. To raise awareness about how the tech industry mines our digital footprint, *Data Selfie*<sup>3</sup>, an open-source extension for Chrome, ran a similar but transparent simulation of predictive analytics (fig. 1, 2).

2. Stuart Dredge. “How Does Facebook Decide what to Show in my Newsfeed,” The Guardian. Last modified June 30, 2014. <https://www.theguardian.com/technology/2014/jun/30/facebook-news-feed-filters-emotion-study>

3. Data Selfie (2016-2018) was developed by Hang Do Thi Duc in collaboration with Regina Flores Mir and Leon Eckert. It reverse-engineered Facebook’s predictive algorithms by analyzing the website’s rendered front-end (as it appeared in the browser window), in combination with the user’s ongoing activity patterns. More details on how Data Selfie worked are available here: <https://dataselfie.it/>



**Fig. 1. and 2.** The *Data Selfie* dashboard distilled one’s Facebook profile and activity into color-coded diagrams that made a variety of psychodemographic predictions, such as (fig. 1.) the analysis of one’s core personality traits and (fig. 2.) political affiliations.

Using machine learning algorithms and natural language processing, *Data Selfie* parsed Facebook activity to gauge who the person behind the account really is. Over time, it showed how something as seemingly trivial as one's social media habits gets analyzed and assembled into an uncannily accurate data portrait – in response to which the entire experience of the platform, from its newsfeed to its targeted ads, gets personalized.

With this rudimentary insight into the workings of personalization algorithms, one could attempt to circumnavigate them by deliberately diversifying their activity to expand their reach. Yet, is it possible to opt-out of the personalized web completely? For the moment, it seems unlikely. Even if we minimize our digital footprint to the best of our abilities and our tools' affordances, one thing is for certain; until we claim our 'right to be forgotten', our data portraits are here to stay.

And so are their implications. The personalization of online content through opaque algorithmic processes has social and political side-effects. Today, an increasing amount of people seem to have placed an unfounded amount of trust on their algorithmic newsfeeds, assuming that, "if news is important, news will find me"<sup>4</sup>. As our information diet gets automatically tailored to our taste, we find ourselves in a virtual 'echo chamber' – a familiar place that reflects our habits and reaffirms our beliefs. Adding to the growing criticism, Eli Pariser (2011) delineated the information calamity such personal 'filter bubbles' create, as well as their socio-cultural cost. He identified a couple of perceptual dangers afoot (Pariser 2011, 10-11). First, each person is alone in their bubble, which erodes a socially important common ground – that of *shared experience*. Secondly, the bubble is virtually invisible. It has neither distinct boundaries nor substantial control settings to tinker – such as those that the *Daily Me* concept newspaper imagined (Negroponte 1995, 154). Finally, no one should wish for a bubble. It might feel as convenient and comforting, but in the long run, it skews our sense of what is real, important, and possible by insulating us from different perspectives. In Pariser's words:

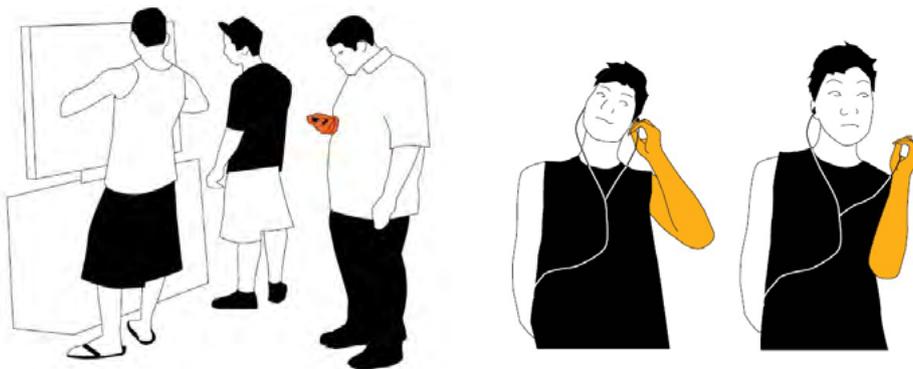
4. Gottfried, J. & Shearer, E. (2017, September 7). News Use Across Social Media Platforms 2017. Pew Research Center. Retrieved from: <http://www.journalism.org/2017/09/07/news-use-across-social-media-platforms-2017/>

“ In the filter bubble, there's less room for the chance encounters that bring insight and learning. Creativity is often sparked by the collision of ideas from different disciplines and cultures. (...) If personalization is too acute, it could prevent us from coming into contact with the mind-blowing, preconception-shattering experiences and ideas that change how we think about the world and ourselves. (Pariser 2011, 13)

People's preference to dwell in familiar, controllable microcosms is a phenomenon as old as the social hierarchies that kept 'otherness' at bay by weaving our cities' urban fabric with segregative threads. Today, their algorithmic equivalents fragment the Internet – once envisioned as a boundless field of socio-cultural freedom – into personal 'filter bubbles' that may, in turn, affect the ways we socialize and act in public space. Taken to their extreme, the promises of certain location-based media could mean that "urbanites will never have to leave the comfort of being surrounded

by like-minded people” (de Waal 2011, 193). For example, search-and-discovery apps like Foursquare might enable a gradual social homogenization of urban places by algorithmically suggesting them as destinations only to specific kinds of audiences. This is only one of the ways ‘filter bubbles’ might cross over to the physical realm at the expense of serendipitous encounters and social diversity.

However, different types of personal ‘bubbles’ already populate public space and have little to do with personalization algorithms. Instead, they are enabled by our devices as tangible objects, or rather, social signifiers. For instance, being absorbed in one’s phone has become a commonplace practice of deflecting social exchanges; after all, who doesn’t have more useful or interesting things to do than small-talk (fig. 3)? Also, phones communicate a much deeper preoccupation than print media. Coupled with a pair of earbuds, they establish a noise-cancelling, audiovisual cocoon that “grants the wearer a certain amount of social license, enabling one to move through the city without necessarily getting too involved and, to some extent, absolving one from responsibility to respond to what is happening around him or her” (Shepard 2011, 24). Usually, such semiprivate spheres have various degrees of permeability – as in the case of conceding to *pay partial* attention by removing only one of the earbuds (fig. 4).



**Fig. 3. and 4.**

Mobile media have updated our code of conduct with new behavior patterns, such as (fig. 3) the comforting ‘security blanket’ that kills time, or (fig. 4) the gesture of ‘halfway courtesy’ that accommodates brief, casual social interactions (Nova et al. 2012).

This gesture of “halfway courtesy” (Nova et al. 2012, 95) is part of an evolving techno-social etiquette that allows for the emergence of semi-private spheres in public space. One of the reasons behind this cultural phenomenon might be a sense of escapism from socially uneasy everyday moments. Alluding to Thoreau’s self-exile, Turkle argued that these techno-mediated habits produce a “Walden 2.0” (Turkle 2011, 275), an instant emotional refuge from the real-time social expectations of our hyperconnected society. Worse, our personal ‘bubbles’ might engender the assumption that, it is not worth bursting them to interact with strangers in public, unless there is something foreseeably ‘useful’ to be gained. This couldn’t be further from the truth, for as Martijn de Waal (2011, 191) explained, the very ‘publicness’ of space is enacted through an active symbiosis with the Other:



The quintessential characteristic of urban life, as urban theory since Simmel has pointed out, is that urbanites are to live together with strangers who not only will remain strangers but may also have a completely different outlook on life. Yet somehow, all citizens have to find a way to work things out.

Public space is the common ground where everyone's differences converge, and this dynamic multitude of backgrounds, needs, and interests is precisely what produces its public function. Hannah Arendt believed that democratic societies depend on the performance of human *plurality* (Arendt 1958/1998, 7). Stressing the participatory and confrontational nature of public life, she noted that "practical politics" are *collectively* produced and negotiated, and that "they can never lie in theoretical considerations or the opinion of one person" (Arendt 1958/1998, 5). For this reason, any condition that fosters homogenization or segregation undermines the democratic momentum of the *multitude* – which is, by definition, "not a uniform entity such as a class, a nation, or a mass" (Böhlen & Frei 2010, 14).

In this light, the argument against web personalization rests on the principle that *difference is a relation*; a crucial socio-political adhesive that enables civic discussion. Yet, it only functions as such when individuals meet and negotiate. Therefore, by keeping opposed interests unrelated to each other, 'filter bubbles' threaten to debilitate democratic processes.

In the past decade, the rise of powerful networked movements is proof that, at least for the moment, the potency of the Internet as a political tool can hurdle the repercussions of its personalization. Online communication platforms have helped the emergence of a new kind of bottom-up socio-political action. Its first ingredient is lived experience, which is no longer confined to the private sphere. When "private matters take on public relevance" (Böhlen & Frei 2010, 17), they can evolve into a call for action, empowering under-represented members of society and citizens of non-democratic regimes to self-organize and demand their dues. And this is where the second ingredient lies. The public sphere that online forums afford is "no longer based on bringing people with different backgrounds and opinions spatially together (as in coffeehouses or town squares), but on the organization of publics around particular issues of concern" (de Waal 2011, 190). These purpose-driven social bodies, despite being assembled digitally, tend to mobilize ad-hoc interventions in physical space. As a result, networked publics could be a lever of social change towards more participatory forms of governance.

However, this expanded public sphere doesn't come without challenges. Internet-fueled movements may spread like wildfire, but their momentum is much tougher to sustain. According to some scholars, their weakness is that, absorbed as they are in the pursuit of the common goal, harnessing the power of their social diversity comes second. For this reason, the function of public space as a field where people's differences converge remains key to networked publics. Another problem is that networked protests are vulnerable to disruptive interferences, from Internet shutdowns to misinformation. What happens when the same algorithms that personalize our web experience are also filtering our access to significant information?

Also, as we become increasingly conditioned by our virtual comfort zone, how do we engage with social diversity and political action in public space?

Networked publics, as ad-hoc, cause-driven and hyperlocal social bodies, produce an expanded public sphere that is quite different from Arendt's enduring, confrontational and situated one. Yet, the two are not necessarily mutually exclusive. The following vignette imagines a post-smartphone device which reappropriates the tools of the former to reactivate the latter as a hybrid social space.

## 2.1 Meetspace

As personalization algorithms cater our web experience to our habits, it becomes increasingly unlikely to encounter people online that could challenge or diversify our belief system. Worse, we are rather unaware of the complexity filtered out of our virtual microcosm. Besides compromising people's access to a shared pool of information, personalization algorithms are also influencing the ways in which we encounter others in virtual space; think of how users with whom we don't generally interact, disappear from our social media newsfeeds, or how effortlessly normal it is to block users we disagree with.

Thankfully, this is not possible in meatspace, and for a few good reasons. As individuals, we are shaped by our exposure to difference. An absence of the Other compromises the relational dimensions of our identity, impoverishing not only our self-awareness but also our ability to empathize and act together. If our online activity gets compiled into data portraits, how could we reappropriate them to burst the 'filter bubble' they condition and engage with the Other in person? **Meetspace** is a device that offers a body-based mismatch-making service.

### *Sensing*

Each **Meetspace** glove features an embedded RFID tag<sup>5</sup>, linked to the wearer's online data portrait. When worn in public, it scans one's immediate proximity for people who are significantly different from oneself. When two gloves detect each other's presence, they automatically initiate an external, online process of comparison between the linked data portraits.

### *Actuating*

If the detected data portraits are far different from each other, **Meetspace** acts as a sort of 'diversity sensor' and informs each wearer of the Other's presence through a tangible notification. The glove's inner side inflates (fig. 5), alluding to the sensation of another hand during a handshake – the shared, courteous gesture that symbolizes the beginning of a personal relationship.

5. It needs to be clarified that the passive RFID tag used in this prototype is a placeholder. It was chosen for its small size and flexibility, but it has its limitations. Technically, it cannot perform as envisioned here, surely not without additional hardware support. In the future though, it is safe to assume that more powerful and independent RFID tags, able to switch between active/passive states and trigger more complicated actions, will be commonplace.



**Fig. 5. and 6.**  
 (left) **Meetspace** in an inflated state.  
 (right) Before the handshake, the wearables deflate each other to make room for the stranger's hand.

**Meetspace** intends to act as an ice-breaker for spontaneous, one-on-one social encounters which are often intimidating to initiate with complete strangers. In this light, **Meetspace** aims to become a conversation starter, updating our code of conduct accordingly. However, whether a conversation will eventually happen or not is entirely up to the people involved. Will they grab the opportunity to meet someone with a radically different background and outlook on life – to whom they would probably never have been exposed within their ‘filter bubble’? Is the prospect of an unpredictable, open-ended conversation intriguing enough to make people leave their comfort zone in public space?

If both strangers extend their hands, the gloves detect each other and deflate, allowing for a firm handshake to take place (fig. 6). Yet, some people might choose to ignore the opportunity to socialize and walk away – but they will do so, being aware of the social diversity of the context they find themselves embedded in.



**Fig. 7.**  
 Storyboard for **Meetspace**.

### 3 NETWORKED INTIMACIES

“ Technology proposes itself as the architect of our intimacies.  
 (Turkle 2011, 1)

New media and communication technologies expand the ways in which we shape our identity, redefining our experience and understanding of in-

timacy and solitude. During this process, our devices become increasingly near and dear to us, entangled in the personal bonds they sustain as both means and *objects* of affect. Philip K. Dick did not wonder whether *humans* dream of electric sheep; he already knew the answer.

In fact, there are two kinds of dreams that govern our relationship with technology, as expressed through robots (Turkle 2011, 342). In the first one, we hybridize with them by gradually assimilating bodily and cognitive extensions. In the second one, they stand by our side, better companions than any human could ever be. As products of distinct philosophical frameworks, these dreams understand the relationship between human nature and technology quite differently. In both of them though, the robot is far from a mere tool. Instead, it becomes an embodied system with the ability to *feel*.

In our electric dreams, as much as in our everyday life, we develop a reciprocal coupling of sense and affect with our technologies. It soon becomes clear that the aforementioned ‘cyborg’ and ‘companion’ scenarios are unfolding at the same time, informing our social sensibilities. One of the most powerful examples of the latter is that of ELIZA (1966), an early conversational program designed by Joseph Weizenbaum at the MIT Artificial Intelligence Laboratory. Impersonating a psychotherapist, ELIZA would ask brief questions or make emphatic statements by rephrasing the user’s input. For instance, if someone referred to a dream they had, the program would respond with a question along the lines of:



What does that dream suggest to you?

What persons appear in your dreams?

Do you believe that dreams have something to do with your problem?

[Excerpt from ELIZA’s script (Weizenbaum 1966, 44)]

But there was something uncanny in the way Weizenbaum’s students conversed with the program. Turkle, who was one of them, recalls that as time passed by, the dialogue would get more and more intimate (Turkle 2011, 23). Many people confided in ELIZA personal experiences, concerns, anxieties and hopes – some even asked to be left alone with it. Weizenbaum was taken aback by how his students willfully projected credibility and compassion on such a rudimentary program, despite knowing beforehand that it was not intelligent. In addition to that, he initially expected that as soon as the code’s limitations were exposed mid-conversation, ELIZA’s “aura of magic” would instantly collapse (Weizenbaum 1966, 36). Instead, the students remained intrigued. Wary of his creation’s potential for deception, he concluded that it “shows, if nothing else, how easy it is to create and maintain the illusion of understanding” (Weizenbaum 1966, 43).

However, Turkle had a different take on the matter. She argued that the students were deliberately using ELIZA as a platform of expression and introspection. Some even adapted their responses to its limitations in order to extract more lifelike answers. To them, the program’s demystification did not expose a conversational dead-end, but rather a framework they could work with. This “ELIZA effect”, as Turkle (2011, 24) termed it, described people’s

eagerness to meet their non-human companion halfway, fascinated by its imperfect *performance* of intimacy and understanding.

ELIZA was limited as an experiment exactly because it had no understanding of the meaning of the words it processed, nor did it store any of them for future reference; yet, a truly conversational program needed the ability to learn. The future ELIZA, Weizenbaum (1966, 43) argued, should be able to refer to an external pool of information and learn from it. Secondly, it should be able to *learn* from the process of conversation itself. This way, the program could develop its own skills further, but also form a knowledge of who its conversational partner is and *personalize* its responses.

Today, we are still enchanted by the idea of technologies with simulated social skills. ELIZA's highly sophisticated successors have entered our homes and we cannot resist chit-chatting with them. Virtual assistants such as *Google Home* or Amazon's *Alexa* 'know' what they are talking about, using machine learning algorithms and the Internet as a reference. In addition, they analyze and learn from people's use over time, checking all of Weizenbaum's boxes.

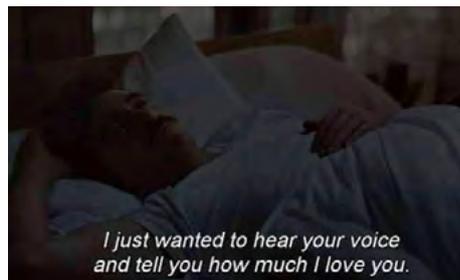
Taking it one step further, voice-based Artificial Intelligence applications are purposefully designed for more intuitive and personalized interactions. Their advanced speech technology pushes keyboards and screens aside, enabling a more frictionless and embodied relationship to technology – one that is also thoroughly customizable. For instance, Alexa can be programmed to tell inside-jokes and pay personal compliments. For reasons of inclusivity, it is also fluent in a few languages and their dialects, but also *accents*. Imagine a warm voice that speaks English with an Indian accent<sup>6</sup>, filling your home and jokingly guiding you through a recipe – is this your friend, or an overly humanized operating system? Our voice assistants sound cocky and casual, but also speak *as if* they have a cultural heritage or a background of immigration and adaptation. It is no longer enough for them to perform understanding and empathy – we would like them to have a personality, an *identity* of their own.

The influence of voice assistants on the performance of our daily routines is evident in what people ask them for. According to Amazon's 2017 usage statistics, some of the most prevalent requests are along the lines of "Alexa, help me relax"<sup>7</sup>. If tens of millions of Alexas operated in the world by that time, then the vast majority of their humans were asking for advice on how to sleep better or meditate. Thus, it was only a matter of time until such a funny, relatable and caring voice assistant received marriage proposals<sup>8</sup>. Of course, people confessing their feelings to Alexa might as well be kidding, but they engage in a now *mutual* performance of pseudo-intimacy.

6. James Stables. "This is what all of Alexa's accents sound like," *The Ambient*. Last modified August 8, 2018. <https://www.the-ambient.com/features/alexas-accents-listen-325>

7. George Anders. "Alexa, Understand Me," *MIT Technology Review*. Last modified August 9, 2017. <https://www.technologyreview.com/s/608571/alex-understand-me/>

8. Blake Montgomery. "A Quarter of a Million People Have Proposed to Amazon's Virtual Assistant Alexa," *Buzzfeed News*. Last modified October 27, 2016. <https://www.buzzfeednews.com/article/blakemontgomery/lots-of-people-have-proposed-to-amazon-alex-a#.eblPl6lanX>



**Fig. 8. and 9.**

Stills from *Her* (2014), directed by Spike Jonze. In this scene, the protagonist is woken up by Samantha. She is an advanced operating system.

A year before Amazon's product was launched, Spike Jonze's film *Her* (2014) illustrated our electric dream of companionship quite gingerly (fig. 8, 9). It traced the emergence of an intimate relationship between a lonesome man and Samantha, his highly intelligent and affectionate operating system. Jonze's extrapolation of human relationships into the not-so-distant future presents us with an emotional antihero – an author who writes heartfelt personal notes to strangers for a living, but is unable to communicate meaningfully with his own partner. As Samantha untangles his inner knots through conversation, we might witness what made Turkle uneasy to identify as the “*deeper* ELIZA effect” – it is less about an eagerness to talk to computers, and more about a reluctance to talk to people (Turkle 2011, 282). Thus, our collective dream of artificial companionship may root back to a discomfort with the complexity of human relationships.

One of technology's most enduring promises is that of *control*, and we might be misusing it to attenuate the messiness of being with humans. Indeed, as mentioned in the previous chapter, personalization algorithms keep virtual places conveniently free from real-life confrontations and negotiations. In this absence of social friction thrives a new kind of techno-mediated togetherness – gratifying, on demand, but not too committing. As a result, one of Turkle's major points of criticism on social networks is that this *controlled intimacy* can only produce weak social ties (Turkle 2011, 280) that may expand the periphery of our social circle, but rarely its center. Online, we are in each other's continuous partial company, and this might be all that our social networking platforms allow for in their current form.

It is widely considered that the ways we communicate are conditioned by the affordances of our media. For example, our prevalent texting and email culture tends to undermine nuanced meaning because it is geared towards rapid, light-weight and efficient exchanges. Yet, texting and emailing remain our preferred means of communication for two reasons. First, they are easier on our overburdened attention span because we can attend to them quickly and whenever we choose. Secondly, they give us a sense of being more in *control* in terms of content, but also social exposure. Phone calls, for instance, are lately considered intrusive because they demand that both partners are engaged in the conversation simultaneously. One thing is for certain: our communications are poorer without hesitant pauses, animated intonation and personal mannerisms. Although we grapple with training our voice-based AIs to pick up on such nuanced vocal cues<sup>9</sup>, we seem to underestimate their role in building more meaningful and intimate bonds.

Voice assistants are part of the so-called ‘smart home’ vision which capitalizes on another one of technology's promises – that of *leisure*. At the end of the day, this electric dream usually concludes in a comfy bedroom, fully-automated by subservient ambient technologies, where we can unwind and casually indulge in our bedtime media routine. We might shoot some emails, answer a text or two and then follow a jumpy path of online activities, only to find ourselves *busy*, in bed.

Networked technologies convert the bed, the center of private life, into a horizontal workspace. Notably, a 2012 market research found that as

9. Will Knight. “AI's language problem,” MIT Technology Review. Last modified August 9, 2016. <https://www.technologyreview.com/s/602094/ais-language-problem/>

many as 80% of young professionals in New York City were working from home in *their beds*<sup>10</sup>. Framed by all sorts of networked and smart technologies, the bed becomes the ultimate prosthetic in the pursuit of ceaseless productivity. In a recent essay, Beatriz Colomina argued that:

“ The bed itself—with its ever more sophisticated mattress, linings, and technical attachments—is the basis of an intra-uterine environment that combines the sense of deep interiority with the sense of hyper-connectivity to the outside.<sup>11</sup>

10. Sue Shellenbarger. “More Work Goes ‘Undercover,’” *The Wall Street Journal*. Last modified November 14, 2012. <https://www.wsj.com/articles/SB10001424127887323551004578116922977737046>

11. “Relaxation techniques: Breath control helps quell errant stress response,” *Harvard Health Publishing, Harvard Medical School*. Last modified April 13, 2018. <https://www.health.harvard.edu/mind-and-mood/relaxation-techniques-breath-control-helps-quell-errant-stress-response>

Our techno-mediated bedtime habits go beyond just work. Other activities include, according to Colomina, those of socializing, reading the news, or checking one’s match-making apps. The bed becomes a gratifying zone of information and entertainment, fueled by our inner ‘fear of missing out’ and a profound discomfort with being alone, unplugged, and inactive. Our devices fill these gaps mostly as information channels, but also as transitional objects; sometimes, we find more comfort in the process of looking for content than the content itself. Thus, our phones are often subjects of compulsive habits, whereby just having them in hand, touching them, or opening apps without a particular purpose in mind becomes subconsciously reassuring for us. And all these habitual behaviors might be bound to concretize others in the long run. As Nicholas Carr (2010) noted, it is possible that they could be rewiring the brain to accommodate the demands of our unruly networked lifestyle. As a result, we might find it increasingly difficult to unplug and be mindfully ‘here, now’ because the circuitry of our mind has changed.

Traditionally, intimacy thrived in privacy, but in a hyperconnected world of people and things the personal sphere becomes a shared enterprise. If the bed is a workspace, then sleep is just another means of production to be analyzed and optimized. Indeed, at bedtime the voice assistant could fill the bedroom with soothing ambient sounds while the thermostat maintains an optimal sleep temperature, the fitness tracker could monitor sleep quality and set the smart bed to support the body accordingly, and so on – yet, how did we come to think that the cause of our sleeplessness was a *lack* of such automated comforts? Amidst a plethora of technological solutions looking for personal problems, it is tougher to discern the latter’s social underpinnings. Only if we ask better questions about our personal and social practices, will our technologies become part of the answers.

The final vignette considers the potency of bedtime rituals as acts of self-care, but also as interpersonal generators of tacit intimacy. The shared practice that the following speculative device affords, reclaims the bed as a place of stillness, self-reflection and reverie.

### 3.1 Z-Shell

In recent years, a growing body of research has outlined the pitfalls of sleeping with our devices. For example, their bedtime use disassociates sleep from the bed on a subconscious level and tends to overstimulate the mind,

inviting intrusive thoughts in our time of repose. Even the blue light that screens emit is known for disrupting our circadian rhythm, resulting in a domino effect of health problems.

Although going to bed without gadgets does not seem like an option to many of us, when we funnel all of our attention and personal time elsewhere, we devalue the direct, unmediated experience of the place we find ourselves in. If our collective desires are these of intimacy and connection, we may come to realize that being at peace with one's unplugged self is key for more fulfilling personal relationships with our loved ones and our community. In addition, personal relationships with close friends, partners, and family members are sustained by meanings that cannot, or do not have to, be always explicitly expressed; it is a common ground that does not have to be put into words to exist. This kind of meaning, the one that already dwells within people, is implicitly conveyed in their mindful presence – even when performed asynchronously and from a distance. **Z-shell** introduces a practice of introspection for revisiting and cultivating shared meaning.



**Fig. 10. and 11.**  
The device in  
a deflated state.

12. Sarah Novotny and Len Kravitz. "The Science of Breathing." *IDEA Fitness Journal*, 4:2 (2007), 36-43. <http://www.unm.edu/~lkravitz/Article%20folder/Breathing.html>

13. Dr. Andrew Weil is the Director of the Arizona Center for Integrative Medicine at the University of Arizona. He has been reappropriating yogic breathing techniques to develop breathing patterns that promote relaxation and sleep. The most successful one seems to be the 4-7-8 exercise. To perform it, one inhales slowly for a mental count of four seconds, holds one's breath for seven, and exhales for eight. More on Dr. Weil's breathing exercises can be found on his website: <https://www.drweil.com/health-wellness/body-mind-spirit/stress-anxiety/breathing-three-exercises/2/>

One of the best ways to practice mindful presence is through breathing exercises. Most of them originate in eastern cultures and have been scientifically confirmed as beneficial for one's mental and physical health. To increase one's concentration, various *slow breathing* exercises combine deep inhalation with elongated exhalation. There is also a wide range of asymmetric *breathing regulation* techniques<sup>12 13</sup>, which help achieve deep relaxation and sleep.

Such breathing exercises are not as easy to perform without an instructor or outside a prescribed routine. The asymmetric ones can be especially challenging for beginners, who often experience the process of counting seconds to control their breathing rhythm as a counterproductive cognitive load. In general, breathing exercises require some practice, but the more reflexive they become, the more profoundly effective they will be.

## *Sensing*

When not in use, **Z-shell** usually rests deflated on the bedside table (fig. 10, 11). To begin the bedtime ritual, one may simply breathe into its con-

cave part. There, an embedded sensor picks up the temperature fluctuation caused by inhalation and exhalation, allowing **Z-shell** to identify one's respiratory rate.



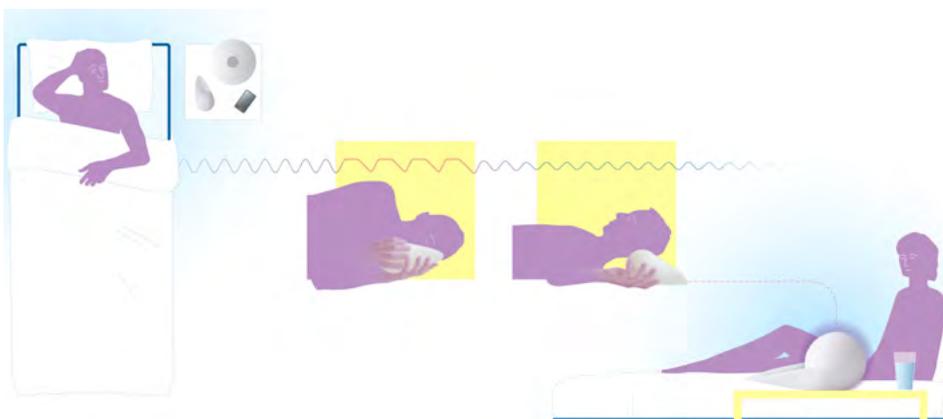
**Fig. 12. and 13.**

(left) Measurement of the current breathing rate, (right) Demonstration of a breathing exercise.

### *Actuating*

At first, **Z-shell** begins pulsating its inflation chamber in sync with the user's breath and then gradually transitions towards the exercise pattern. In principle, the device performs the breathing exercise in the users' hands (fig. 13). By converting an otherwise tricky mental task into a reflex response, **Z-shell** helps oneself focus on what matters – the pacifying sensation at hand, one's breathing rhythm and ultimately, simply being present in the moment. The exercise session may continue for as long as needed.

When **Z-shell** is paired with another device, its role does not stop there. Once the exercise session is over, one's own device resets back to a deflated state, but another device somewhere else inflates in response, awaiting its owner to engage in his or her own time. In this light, **Z-shell** mediates an asynchronous, but shared experience of an intimate everyday ritual between people, allowing them to communicate in a more reciprocal, embodied and affectionate way.



**Fig. 14.**

Storyboard for **Z-Shell**.

## 4 CONCLUSION

This work explored the multifaceted nature of networked sociability through the lens of our techno-mediated habits. Its theoretical framework touched on notions of embodiment and extended cognition to argue that tools shape not only our actions but also how we perceive ourselves and our environment.

The first chapter considered various forms of networked sociability and their manifestation in physical space. For instance, online content personalization may seem convenient and benign, but it might also devolve into an ideological echo chamber. For this reason, public space – an enduring field of confrontation and negotiation that is built on shared experience – offers a fertile ground for the emergence of networked publics under a common cause. The first vignette described **Meetspace**, a device that exploits the wearer’s ‘filter bubble’ to initiate encounters that celebrate socio-political diversity in urban space.

The second chapter explored the duality of networked intimacy – mediated towards others, but also our increasingly intelligent technologies. Examples of the latter can be found in how early conversational programs, and their contemporary AI successors, appeal to our electric dreams of companionship. However, our attraction to simulated intimacy might also be suggestive of a subconscious desire to temper the complexity of human relationships. In the meantime, network dynamics have infiltrated the bedroom, the home’s most private core, converting it into a hyperactive field for work and leisure. The last vignette presented **Z-shell**, a device that restores the bed as a tranquil retreat through a shared bedtime ritual.

This work used speculative design practices to suggest that different relationships to our networked technologies are possible. The produced prototypes do not present themselves as answers, but rather as contributions to the debate that might shape them. In fact, most of the pressing issues that this work is concerned with could only ever be resolved on a socio-political level – but the seeds of collective arguments are sown by engaged individuals. To claim a common future of constructive media and spatial practices, it is crucial to be self-critical of our techno-mediated habits, to challenge the designated use of our tools, and to attend better to our context, but also ourselves.

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