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Luis Hernan & Carolina Ramirez-Figueroa

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Luis Hernan
School of Architecture, The University of Sheffield, Sheffield, United Kingdom
luis.hernan@sheffield.ac.uk

Carolina Ramirez-Figueroa
Information Experience Design, School of Communication, Royal College of Art, London, United Kingdom

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A Home with a Future. Digital Domesticity and the Vague Fictions of Silicon Valley

Luis Hernan and Carolina Ramirez-Figueroa

ABSTRACT The last two decades have seen an explosion in the numbers of digital devices that "*weave themselves into the fabric of everyday life*." Here we bring to critical attention the material, ethical and spatial consequences of integrating digital devices in physical spaces. We concentrate on the way Silicon Valley constructs a narrative of *digital domesticity.* Harriet Riches uses the term to describe online magazines that seek to revive hand-made crafts, domestic life, and a yearning for the slower pace of a, ironically, pre-digital life. We reflect on the way that Silicon Valley makes use of *vague fictions*—narratives that blur the divide between present and future—as a way of presenting us with a vision of domestic life that is at once nostalgic of social forms and accommodating of new technologies.

Introduction

In 2011, Nest Labs launched their eponymous *smart thermostat*, an internet device that *learns* its users' behaviors[1]. Nest was founded by

Tony Fadell, the controversial engineer and "entrepreneur" who fashions himself as the father of the iPhone. Ever the corporate storyteller, Fadell describes the "eureka" moment that gave way to the smart thermostat: he had just left Apple after leading the development of the iPod and iPad and embarked on an extended family holiday around the world while overseeing, remotely, the design of a new family home at Lake Tahoe, the "*greenest, most connected house*." As he lived the bohemian life of a globetrotting "expat," Fadell surveyed the homes he stayed in—of all technologies designed for the home the thermostat had received the least attention. Something had to be done—and the mobile phone was the answer: "*when you have an iPhone in your hands at all times, the things in the world change*" hands fling open, symbolizing the vastness of his vision, voice rising to an ecstatic pitch "*Right? So, think about the interface to your world, in your hand at all times. How does your car change? How does your person change? How does your home change? Your office changes? So, we set out to build a home (…) that the iPhone would be the center of.*" The rest, as they say, is history. Fadell would go from controversy to controversy eventually leaving Nest, a company that would be turned into a Google "brand" of connected speakers, displays, thermostats, cameras, doorbells, Wi-Fi routers and security devices (Figure 1).[2]

The vision of a "connected" home has a long genealogy. Smart devices were the stuff of long reviews in specialized magazines at the turn of the century, passionately chronicling an arms race of startups developing the latest appliance, be it a humble lightbulb or a fridge, totems of a desire for "*efficiency, security, and utilitarian control in a technologically mediated and enabled environment*."[3] Technophilic, wealthy (often male, often white) homeowners of the 1990s would passionately speak of "home automation" at dinner parties, a paradise of "*fancy lighting, clever thermostats, home theaters, various flavors of remote-control doors and windows, and, for the paranoid, scary anti-burglar security and surveillance*."[4]

As we review here, the thought of making the home into a "*technologically perfected artifact*" can be traced back to the emergence of electric appliances, consumer shows and the houses "of the future" that mid-century American corporations invested small fortunes in producing. But Nest's thermostat signaled a growing interest of Silicon Valley's "*gang of four*"—Amazon, Alphabet, Apple, Facebook—to branch out and expand their domain to domestic technologies. Their efforts follow contemporary discourses in Human Computer Interaction around notions of *ubiquity* and *smartness*. Ubiquitous devices are intended to become invisible so that they, in the words of Mark Weiser, "*weave themselves into the fabric of everyday life until they are indistinguishable from it*."[5] If ubiquity is the path, *smartness* is the destination; a perceived state of grace in which all social and environmental challenges are seamlessly solved by data and technofixes.

Here we argue that Silicon Valley uses deliberatively vague, fictional narratives to promote a vision of domestic life. We propose the notion of *vague fiction* to describe speculative scenarios where the boundary between reality and imagined future is blurred. Different authors have described the role of fiction in actualizing and bringing about technological progress, but we point out that these are often based on the assumption that reality and fiction are separated by solid, impenetrable boundaries. As two Latin-American writers operating in

Figure 1
Tony Fadell speaks at LeWeb 2012 Paris conference. "Tony Fadell, Founder & CEO, Nest Labs, Inc.-1236" by Kmeron is licensed with CC BY-NC-ND 2.0.

English-speaking academia, we are influenced by Magical Realism in suggesting that a membrane divides fiction from reality, thinning and thickening along its length to allow numerous sites of exchange.[6] Our positionality makes us write from the margins, looking in a dream of domesticity that we, growing up in Mexico, could only experience vicariously in TV shows and Hollywood films. We draw on speech analysis, hermeneutics and interpretative theory to analyze how Vague Fictions allow corporations to bring into existence a *digital domesticity*, a vision of domestic life where each space is carefully programmed through the seamless integration of digital devices, where home becomes a place of inconspicuous consumption. We use historical parallels with mid-century corporate America to scrutinize the notion of digital domesticity and suggest that the vague fictions of Silicon Valley not only influence the materiality of contemporary homes, but condition how the future home can be imagined. Our allies in this operation are diverse. We are inspired by Mary Douglas in understanding the home as having structure in time, which makes us explore the moral dimension of homes that are constantly structured in the future tense yet with a selective memory of the past. In calling for critical scrutiny of the way that the domestic is imagined and realized in the digital age we follow the lead of Shannon Mattern, who has spearheaded with a similar project reflecting on the consequences of applying a computational logic in the design and understanding of our cities. In examining the way that futures and past coalesce in our understanding of comfort and convenience, we aim to engage in a creative dialogue with Jennifer Bloomer and her analysis of nostalgia in the modernist project.[7]

Inspired by Real Life

It is the Christmas of 2017 and the streets of various cities in North America and Europe are strewn with posters and hoardings of *#justAsk*. One image shows Echo on the foreground with the sketch of a dog sitting behind it, pouch face looking right and pointing to the device. A caption, handwritten style, frames the image "*Alexa, reorder dog food*." A smaller paragraph sits beneath: "*Just ask Alexa to help with the shopping without lifting a finger. Get music, news, control your smart home and more, simply using your voice*." The graphic style, combining photography and illustration, suggests a nostalgic view of domestic life. Echo doubles as utensil holder, microphone, topper for a Christmas stocking, baking tray, shaving cream, baby bottle, battery, aerobics stepper, cocktail glass, hairspray can, paint bucket, lipstick, Christmas tree, table lamp. Incantations conjure up an all-mighty, cloud-based domestic assistant—*Alexa, reorder shaving cream; play lullabies; reorder more batteries; play workout music; what is the weather like in Hawaii? set the turkey timer for five hours; reorder hairspray; play music for cooking; where's the nearest hardware store? reorder lipstick; turn on Christmas; turn off the lights* (Figure 2).

How are we to read *#justAsk*? Initially, it is a marketing campaign: a series of TV and printed ads aimed at selling a new product. Its graphic technique generates a fruitful tension. We interpret the photographic image as depicting reality and hand-drawn sketches as imagined—not entirely "real." The photographic image appears solid; the illustration ethereal. The technique presents Echo as an intuitive piece of equipment threaded invisibly onto the fabric of life itself. Echo is unobtrusive, the pinnacle of convenience.[8]

What makes *#justAsk* more effective is its blurring of reality and speculation. We are led to believe the images document the device as it is used *by thousands of customers around the world.* In *Alexa Moments*, a previous campaign, Amazon claimed to collect data to produce a series of video vignettes of domestic life. Describing the production, Amazon's creative team claimed to have been "*inspired by real user stories, some of them gleaned from the more than 43,000 customer reviews of the product on Amazon*."[9] The graphic style in *#justAsk* produces a similar blurring. The combination of photographic and hand-drawn elements yields a productive ambiguity: we are left to wonder how much of the images is

Figure 2
Amazon Echo as it weaves itself onto the fabric of everyday life. "Amazon Echo" by stockcatalog is licensed with CC BY 2.0.

documentary—reflecting real-world usage of technology or, to borrow Denis Wood's term, *propositional*—mediating, presenting, and constructing the world in deliberate configurations.[10]

But the conceit of convenience quickly wears thin. Features in newspapers, blogs, and social media document "*gaffes*," "*mishaps*," "*epic fails*." Twitter feeds tell of shopping lists with "*girlfriend*" and "*hunk of poo*," of devices "*going rogue*."[11] *#justask* and *Alexa Moments* create a reality where these devices operate seamlessly; where hunks of poo are not on shopping lists and robust voice recognition algorithms effortlessly turn your requests into reality. A present that doesn't exist. Amazon tells us otherwise though: thousands of their valued customers live a better life thanks to Echo (Figure 3).

Vague Fictions

There is a long tradition of using fiction in Silicon Valley. Apple, for example, released their Knowledge Navigator in 1987, featuring an anthropomorphic, voice-activated personal assistant.[12] More recently the typology of "*House of the Future*" and "*Room of Tomorrow*" have been used by corporations such as Microsoft and Samsung to showcase their

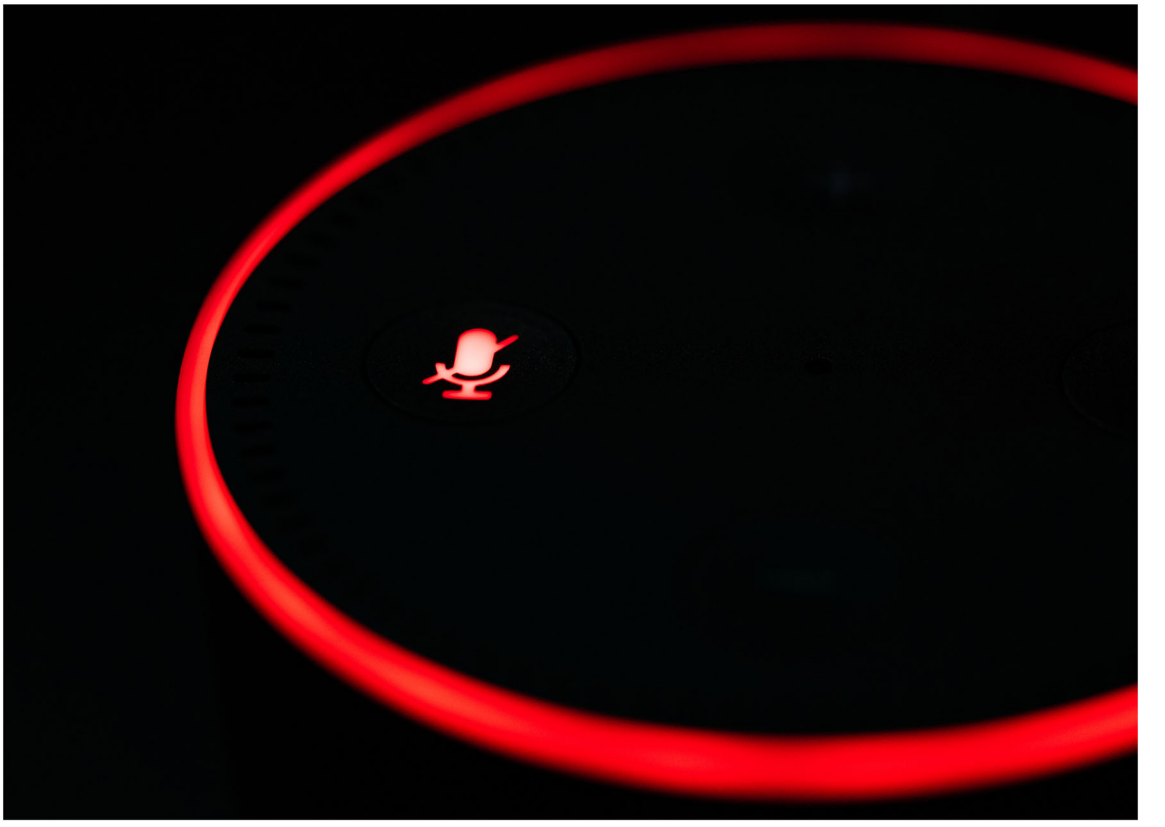

Figure 3
An Amazon Echo Dot with its microphone deactivated, a "privacy" feature. "Red Ring on Amazon Echo Dot - Alexa Device" by Tony Webster is licensed with CC BY-SA 2.0.

products as part of a better, more prosperous version of our lives. There is a crucial difference however with the fictional narratives of Amazon. While the label "of the Future" signals a speculative exercise, Amazon engages in a form of *vague fiction*, presenting its vision of the future as our present.

Eugene Thacker argues that contemporary technoscience has appropriated fiction. The role of imagining possible futures has historically allowed literary fiction, and especially science fiction, to comment on the intersection of society, science, and technology. Contemporary corporations, however, actively use science fiction as "*meta-level discourse for the promotion, justification, potential application and development of products and services*."[13] In their hands, narratives are used as a tactic of "actualization," promoting scientific and technological progress. Literary fictions, on the other hand, are critical and multi-perspectival, interested in potentiality rather than actualization: in imagining futures (and pasts) that may exist as well as those that may not and should not. Corporate fictions are not accessible—they cannot be read, seen and participated—unless we *buy* into them by acquiring their devices. By this point their fiction has turned into our reality and we must live with its consequences

Amazon conceals its use of speculative fiction. There is no declaration of fictional futures, no "*Amazon House of the Future*" flashing on the screen. The difference is in the tense. Houses of the Future are in a simple future one; this will be the future of the home in a few years. They are, by nature, visionary; they influence action by promising luxury, sophistication and technological progress.[14] The fictional exercises of Amazon, on the other hand, are formulated in the future perfect. They operate in a way that can be described through Alan Badiou's notion of *forcing:* "*the point at which a truth, although incomplete, authorizes anticipations of knowledge concerning not what is but what will have been if truth attains completion*."[15] Although the visions of Amazon appeal through their promise of a technological utopia, they do so by anticipating a reality in which their devices *will have been* adopted and became the center of an all-digital domesticity (Figure 4).

Concealment makes fiction ever more powerful. Sara Ilsted Hjelm has discussed how the notion of ubiquity is doubly invisible. She draws from the use of the term in feminist studies, where it highlights how dominant discourses operate by describing their principles as normal and self-evident. Appealing to common sense makes opposition difficult; any critique or action against is considered vague, indistinct and temporary.[16] Hjelm suggests that computational devices have often been normalized by appealing to principles of convenience. Weaving them onto the fabric of everyday life conceals the otherness of computational devices; it makes their users less aware of them as their effects become invisible. A similar mechanism can be detected in the fictional narratives of Amazon. Extrapolations create a texture of realness to their visions of domestic

life. As with the graphical style of the magazine ads, the line between reality and the technological capabilities of Echo are blurred. There is little room left to discuss the consequences of digital technologies infiltrating domestic spaces. These devices are simply *magical*[17] and there is little sense in opposing them; they *have already* happened, as certified by thousands of satisfied Amazon customers. To argue would be luddite.[18]

Something wonderful happens…

The tactics in vague fictions have a long genealogy, stretching to American consumer shows of the early twentieth century and prototype homes developed by mid-century corporations. In 1956 General Electric and Westinghouse Electric Corporation launched *Live Better Electrically*, a marketing campaign that promoted a "*modern, happier, healthier life*." One of its commercials describes a future home where *"you step into an entirely new concept of living (…) Electric heating and cooling keep the home comfortably and automatically at the most livable temperatures all year round and keep it clean and helpful too."*[19] *Live Better Electrically* operates as a vague fiction. Homes were not presented as speculations, but a reality that many American families were already living. "*Something*

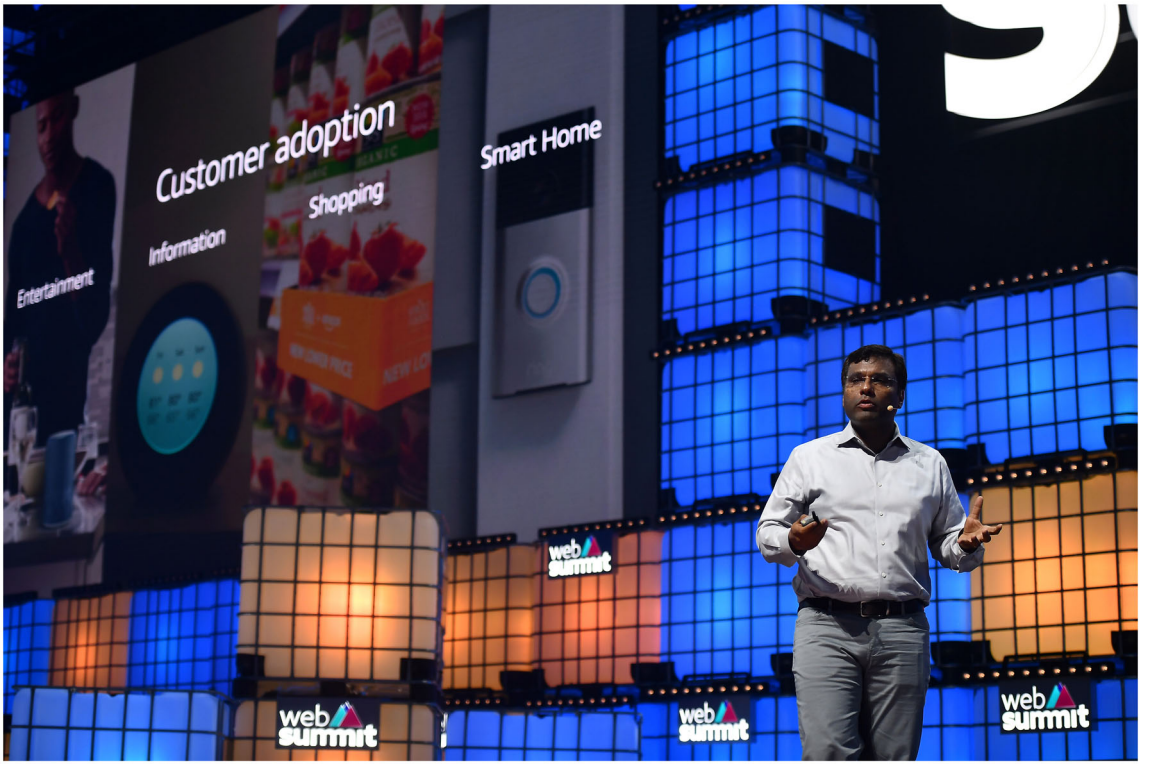

Figure 4
Rohit Prassad, vice president and head scientist of Alexa, addresses the audience of the Web Summit as he talks of the integration of Alexa and the "Smart" home. "DF1_8820" by Web Summit is licensed with CC BY 2.0.

wonderful happens when you begin to Live Better Electrically" Bill Goodwin tells us in an episode of General Electric's *GE Theater*. "*These people are living better electrically. Now, you can too…* " he goes on before a disembodied hand interjects "*Now wait a minute Mr. Goodwin*" Bill's face looks befuddled "*It's a wonderful idea, but my family is on a budget*" Bills face turns calm, reassuring "*And one of the best things about Living Better Electrically is this: your family, every family can afford it*." "*Oh, how much does it cost*?" comes back the mellowing voice of the disembodied hand "*As little or as much as you like. The secret is you see, you don't have to do it all at once. But you should start to plan now*" (Figure 5).[20]

Figure 5
A medallion of the Live Better Electrically campaign. Developers were given an option to apply for the distinction based on the number of appliances that ran entirely on electric power. The accolade proved to be useful when promoting the houses initially and later a burden as soaring electricity bills meant these homes were financially difficult to maintain. "Total Electric Gold Medallion Home Electrically Award " by Karitxa is licensed under CC BY-SA 4.0.

The use of vague fictions in *Live Better Electrically* responds to an overuse of speculation in previous decades. Brian Horrigan reminds us that the phrase "Home of Tomorrow" emerged in the 1930s as a confluence of disparate but mutually amplifying factors: a burgeoning architectural Avant Garde; an aspiration to produce cheap dwellings for the American public; and efforts by appliance manufacturers to turn the house into a technologically perfected artifact.[21] Starting with *The Dymaxion House* by Buckminster Fuller, the late 1920s and early 1930s saw the rise of a generation of young engineers who saw in prefabrication the possibility to create a distinct new future for the home, which they saw as one of America's sacrosanct institutions that had fallen into technological complacency.[22] His efforts were followed by those of Avant-garde architects, spearheaded by Richard Neutra with his Lovell House, a veritable machine for living, and his plans for a mass-produced "Diatom I + II." In both examples, Neutra traded on American technological utopianism and drew on the esthetics of modernism to present their clients with a luxurious and style-conscious future.[23]

Inspired by this confluence, American corporations produced their own visions of the future. General Electric unveiled their *House of Magic* followed by Westinghouse's *Home of Tomorrow* in 1934, a cross between a demo house and a lived-in prototype that drew on an electric load equivalent to 30 average homes and was "*ready to do the work of 864 servants with the flip of a switch.*"[24] These competing, often contradictory visions of the future generated an atmosphere that Horrigan describes as feverish and carnivalesque: "*The phrase '_____ of tomorrow' gradually lost its connotations of prediction, prescription, and solution and was indiscriminately applied to everything (…) By the end of the 1930s, the phrase was merely an advertising slogan*."[25] The American public learnt to read the typology correspondingly; they were entertained, but they weren't buying. Framing *Live Better Electrically* as anything but a "_____ *of tomorrow*" may have helped create a commercially successful and culturally lasting campaign.

Digital Domesticity

Like Westinghouse, Amazon uses vague fictions to realize *digital domesticity*. The home is, Mary Douglas tells us, a space of routine. It relies on its pattern of regular doings to generate an embryonic community. It is nonprofit, a source of loyal support and solidarity.[26] It is a space of radical potential where material scarcity, poverty, depravation and hardship often exist.[27] But the home imagined by Silicon Valley is different. It is glossy and bright; a space where happiness is reached by conspicuous consumption; a "*cornucopia of material abundance*"; a technologically perfected artifact.[28] Digital domesticity is a hegemony in which each space is carefully programmed to seamlessly integrate with digital devices. It is also an ideal that deals in anachronistic tropes of gendered labor and leisure. Thao Pann argues that the relationship

between digital assistants and humans is modeled on the relationship between servant and master of the 19th and early 20th centuries.[29] This highly prescriptive domesticity also perpetuates gendered domestic labor. As Yolanda Strengers argues, maintaining the dense meshwork of digital devices and infrastructure requires new activities of "*researching, upgrading, updating, maintaining and integrating*," often a "male" activity.[30]

The digital domesticity promoted by Silicon Valley's *gang of four* also aspires to change the design and commercialization of homes. *Amazon Experience Centers* showcase prototype houses, carefully tailored with specific services, features and "commands" that Alexa is capable of understanding. Instructions are given to visitors in small cards scattered throughout the showroom. "*Just ask 'Alexa, start party time'*" reads one "*with this command, Alexa will … partially lower the shades, dim the kitchen lights, turn on your party list, turn off your TV*." *Alexa, good night*" will lock the front door while Echo replies: "*Good night! Enjoy your beauty rest—not that you need it! You're PJ fabulous*."

In September 2018 *Plant Prefab* announced they were receiving funds from the *Amazon Alexa Fund*. Paul Bernard, from Alexa's Fund, describes the company as a "*leader in home design and an emerging, innovative player in home manufacturing*"[31] with patented prefabrication technology to build homes at affordable prices. The partnership, it was announced, is intended to develop prefabricated homes that leave the factory with Alexa-enabled devices already installed. In an echo of the *Westinghouse Plan's Guide*, Plant Prefab offers its clients a catalogue of customizable plans they can choose from or adapt.

The partnership with Plant Prefab followed a similar announcement that Amazon would be partnering with Lennar, described as "*America's largest homebuilding company*." Experience Centers have been installed in key locations across the United States. Nish Lathia, general manager for Amazon Services, describes how "*as one of the nation's largest homebuilders, Lennar offers the potential to enable this experience within easy driving distance of millions of customers*."[32] More recent alliances include *House in a Box*, a collaboration with *Studio AMA Albera Monti Architetti* that includes two prototype apartments equipped with designer furniture carefully blended with Amazon devices and services.[33]

Home Colonized

The parallels between midcentury corporate America and Silicon Valley suggest that vague fictions are one of several tactics used to colonize the idea of home. GE and Westinghouse redefined American domestic life through technology. They changed the habits of Americans—creating new rituals of being at home—and modified the material conditions in which homes were produced, financed and promoted.[34] The vague fictions of Silicon Valley are deployed to build a *digital domesticity*, a term we

understand to mean a vision of domestic life that is at once nostalgic of social forms and accommodating of new technologies.[35]

At stake in the construction of a digital domesticity is who gets to define, maintain and adapt our homes "of the future." As our analysis of their twentieth century predecessors show, corporations have long attempted to influence the way that people understand homes and imagine themselves in them. Tony Chapman and Jenny Hockey reflect on the complex interaction between corporate interests and the (limited) influence they often have in shaping the needs and desires of their "costumers." Analyzing the history of "Ideal Home," a yearly exhibition held in London since 1908, they argue that people are not empty vessels to be filled with the "*interests of capital and the manufacturer's marketing departments*"—their lived experiences and social context influence just as much how their ideal home looks like. Corporations are manipulative and rapacious but their ability to shape desire is tempered by their "customer's" imagination.[36]

However, there is something more insidious about the vague fictions of Silicon Valley that merit further critical scrutiny. By making present and future indistinguishable, these fictions become tactics to colonize the mind. The visitors of the consumer shows analyzed by Chapman and Hockey have a clear sense that they are participating in a fiction—the prototype homes they step in to speak to their fears and hopes but the manufacturer's vision disappears as soon as they leave the fair. The visions of Silicon Valley have lost any trace of their fictional nature, we are told they are not "of the future," but very much the present that "thousands of valued customers already enjoy." The vagueness not only collapses temporality—being unable to tell present from future—but also dulls our ability to hold their authors accountable. When Fadell regales us with his tales of smart homes and machines of loving grace, who is speaking? Are these *his* visions? He would say no, he is simply channeling the market, realizing the dream of every homeowner. His family trip around the world becomes our own metaphorical journey of soul searching. He was looking for his next device; we for domestic bliss.

The vague fictions of Silicon Valley are part of a wider material and rhetorical discourse. Scholarship around digital cultures has highlighted a myriad of privacy issues emerging as part of the ever more prevalent presence of digital technologies in our daily lives.[37] The idea of a digital home can be framed in the same terms, highlighting the risks of turning a space that is fundamentally "private" into the core of Silicon Valley's information asymmetries, collecting vast amounts of data in ever more opaque computational transactions—will the way we wash our clothes or our weekend breakfast routine influence the next ad we see on our screens? But as Fillipo Santoni de Sio and other researchers from the Digital Philosophy Group at Delft University point out, preoccupation over individual privacy is often misled and obscures a more fundamental issue: the unprecedented amount of power over our daily lives that digital

corporations acquire with an ever-expanding range of "products" and "solutions."[38]

We opened this essay by describing the posters of *#justAsk* that lined the streets of European and North American cities in the winter of 2017. Tableaux of domestic life are shown in the stage of urban life, hinting at the ambition of Silicon Valley to become the "operative system" to our daily lives across scales: urban to personal, public to private. The meticulous work of Shannon Mattern documents the expanding ambition of Silicon Valley, lately poised in building cities "from the internet up" and shifting our understanding of the urban realm to fit the logic of the computer.[39] A critical project similar to that of Mattern in urban design is needed to chronicle the transformation of the domestic realm by Silicon Valley, one that might start by understanding the way that ideas of digital domesticity are part of a rhetoric deployed to create hegemonies of the mind: fictions that dictate the terms in which the future can be thought of and imagined. The vague fictions of Amazon leave aside critical potential, the ability to explore potentialities: "*futures that may exist, as well as futures that will not exist (or should not exist).*"[40] Their vagueness gives us a sense of choice—we can assemble the ecology of smart devices as we wish, with as much or as little components as we are prepared to buy, mixing and matching elements from Apple, Amazon or Google to our heart's content. Our ability to fictionalize is reduced to weakened esthetics.

What is architects' stake in digital domesticity? What role, if any, do we play? Rem Koolhaas suggests we should "sit at the table" with Silicon Valley and claim a role in the definition of Smart Homes and the Internet of Things. In line with the discourse of OMA's *Elements of Architecture* exhibition at the 2014 Venice Biennale, Koolhaas points out the increasingly marginal role of architects in designing buildings as they hand over responsibility to a panoply of technical professionals. He symbolically heeded his own advice by sitting down to debate the future of technology and architecture with Tony Fadell while publishing a few articles to warn us that, soon, *our house might betray us*.[41] As Claudia Dutson suggests, it is difficult to "disrupt" Silicon Valley without being absorbed and exploited in the attempt (and acquire a taste for hyperbole).[42]

The relevance of engaging with and scrutinizing digital domesticity feels more urgent writing in the context of COVID-19. The experience of lockdown and social distancing restrictions in many countries have brought to sharp relief the contours of new, digitally assisted forms of being at home. The "House of the Future" in pandemic times is not a cornucopia of convenience but a collection of clunky devices and internet connections of various qualities. The house of the future is a place where the domestic and the public collapse and coalesce, but only for a selected few in the middle classes and in some geographies. We believe there is another role for architects in this brave

new world of digital domestic bliss. There is a need to engage the visions of Silicon Valley as fictions, highlighting their vagueness but also presenting alternative visions that are not aligned to the interests of capital. Speculative projects such as Archizoom Associati's *No-Stop City,* or Ant Farm's *Inflatocookbook* show the potential of architecture to produce alternatives to corporate discourse and to critique the way that homes are co-opted by market forces.[43] Just as it is now impossible to think of a home without a fridge or a washing machine, it becomes increasingly difficult to imagine one without an internet connection and a smart assistant. And it is precisely now that we need architecture to provide imagination—to provide branding free alternatives.

Luis Hernan is a Lecturer in Architecture and Digital Cultures at the Sheffield School of Architecture, where he leads the PhD by Design programme and the Creative Enquiry pathway. His teaching focuses on Humanities modules in under and post-graduate, including the module "Narrative Futures: Architecture and Society." His research explores the interface of technologies, space, everyday life and the urban environment. It combines critical theory with design explorations to interrogate technology and its spatial politics, as well as challenging discourses of technological utopianism, progress and necessity. His creative practice includes photography, creative writing and poetry.

Carolina Ramirez-Figueroa is a Senior Lecturer in Information Experience Design at the Royal College of Art. Carolina's research explores the challenges and opportunities found when living systems are understood as a form of matter for design. She is interested in understanding the cultures, practices, tools and economies of working and designing with living systems. She has collaborated with a number of artists, designers and scientists, and has exhibited, and participated in different art and design venues around the world including Helsinki, Edinburgh, Belgium, Canada, Taiwan and Japan and more recently at the Barbican Center as part of the exhibition Biological Buildings showcasing her work on the AHRC funded project NOTBAD. The project operates in the context of contemporary efforts against Antimicrobial Resistance (AMR) and looks at the way materials can alter and improve health and the human microbiome.

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particularly grateful to Professor Suzanne Ewing, whose patient and detailed comments were decisive in shaping our argument.

Notes

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7. Mary Douglas, "The Idea of a Home: A Kind of Space," *Social Research* 58 (1991): 287; Harriet Riches, "Pix and Clicks: Photography and the New "Digital" Domesticity," *Oxford Art Journal* 40, no. 1 (2017): 185; Shannon Mattern, "Of Mud, Media, and the Metropolis: Aggregating Histories of Writing and Urbanization," *Cultural Politics* 12, no. 3 (2016): 310; Jennifer Bloomer, "The Unbearable Being of Lightness," *Thresholds* 20 (2000): 19.
8. Donna Haraway, 'A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century', in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York: Routledge, 2003), pp. 149–81. The narrative behind "smart" devices frames them as unobtrusive pieces of equipment that either sit at the periphery of everyday life, or are woven into its fabric to the point they are hardly noticeable. The reasons behind this rhetoric are analyzed by Sara Ilstedt Hjelm (see note 18) and connected to a strategy of making new technologies less threatening. One disadvantage of the approach is that it relegates any form of ethical understanding of the implications of these pieces of technology becoming a life companion, in line with Haraway's analysis. By using these devices, we become (ever more) "*hybrids of machine and organism, a creature of social reality as well as a creature of fiction*."
9. Tim Nudd, "Amazon Made More Than a Hundred 10-Second Ads Asking Alexa the Funniest Things," *Adweek*, para. 2. http://www.adweek.com/creativity/amazon-made-more-hundred-10-second-ads-asking-echo-funniest-things-173901/.

10. Denis Wood, *Rethinking the Power of Maps* (New York: Guilford Publications, 2010).
11. Chitra Ramaswamy, "'Alexa, Sort Your Life out': When Amazon Echo Goes Rogue," *The Guardian*, January 9, 2017. Available online: https://www.theguardian.com/technology/shortcuts/2017/jan/09/alexa-amazon-echo-goes-rogue-accidental-shopping-dolls-house; Alice Truong, "Amazon Echo Owners Are Finding Unexpected Items like "Big Fart" on Their Shopping Lists," *Quartz*, June 12, 2016. Available online: https://qz.com/704616/amazon-echo-owners-are-finding-unexpected-items-like-big-fart-on-their-shopping-lists; Lucy Bayly, "Amazon's Alexa Went Bonkers, Reset a User's Thermostat," *NBC News*, March 11, 2016. Available online: https://www.nbcnews.com/tech/tech-news/amazon-s-alexa-went-bonkers-reset-user-s-thermostat-n536651.
12. Brent Rose, "Apple Predicted Siri 24 Years Ago So Perfectly It's Scary," *Gizmodo*, April 10, 2011. Available online: https://gizmodo.com/5846630/apple-predicted-siri-24-years-ago-so-perfectly-its-scary (accessed January 25, 2018); Gil Press, "Apple And The Future Of Computing," *Forbes*, December 18, 2017. Available online: https://www.forbes.com/sites/gilpress/2017/12/18/apple-and-the-future-of-computing/2/#528ca3236540 (accessed 25 January 2018); Áine Cain, "In 1987, Former Apple CEO John Sculley Launched a Video Depicting the Computer of the Future—and People Were Furious," *UK Business Insider*, October 29, 2017. Available online: http://uk.businessinsider.com/apple-future-computer-knowledge-navigator-john-sculley-george-lucas-2017-10 (accessed January 25, 2018).
13. Eugene Thacker, "The Science Fiction of Technoscience: The Politics of Simulation and a Challenge for New Media Art," *Leonardo* 34, no. 2 (2002): 155, 157.
14. Yolande Strengers and Larissa Nicholls, "Aesthetic Pleasures and Gendered Tech-Work in the 21st-Century Smart Home," *Media International Australia* 166, no. 1 (2018): 70.
15. Alain Badiou, "Truth: Forcing and the Unnamable," in *Theoretical Writings*, ed. Alberto Toscano and Ray Brassier, Continuum Impacts (London: Bloomsbury Publishing, 2006), 130.
16. Sara Ilstedt Hjelm, "Visualizing the Vague: Invisible Computers in Contemporary Design," *Design Issues* 21, no. 2 (2005), 71.
17. Julia Carrie Wong, "A White-Collar Sweatshop: Google Assistant Contractors Allege Wage Theft," *The Guardian*, June 25, 2019. Available online: https://www.theguardian.com/technology/2019/may/28/a-white-collar-sweatshop-google-assistant-contractors-allege-wage-theft. The rhetoric used in describing devices often emphasize their seamlessness and magic. The 2019 Google I/O, their annual developer conference, opened with a question "do you believe in magic?" followed by the dictum "keep making magic."
18. Agnesse Sanvito, "Be More Positive and Less Paranoid about Tech Says Patrik Schumacher," *Dezeen,* January 30, 2019. Available online: https://www.metropolismag.com/architecture/post-digital-collage; Mario Carpo, "Post-Digital Quitters: Why the Shift Toward Collage Is Worrying," *Metropolis*, March 26, 2018. Available online: https://www.metropolismag.com/architecture/post-digital-collage.
19. Michael Houser, "Live Better Electrically: The Gold Medallion Electric Home Campaign," Department of Archaeology & Historic Preservation Washington State. https://dahp.wa.gov/historic-preservation/historic-buildings/historic-building-survey-and-inventory/live-better-electrically-the-gold-medallion-electric-home-campaign (accessed April 23, 2019).
20. Joe Connelly, dir., *Judy Garland Musical Special, General Electric Theater* (New York: CBS, 1956). Available online: https://www.youtube.com/watch?v=7Fwramn5U3M.
21. Brian Horrigan, "The Home of Tomorrow, 1927-1945," in *Imagining Tomorrow: History, Technology, and the American Future*, ed. Joseph J. Corn (Cambridge, MA: The MIT Press, 1986), 137.

22. Richard Buckminster Fuller, 4D Time Lock: In Which the Great Combination Is Revealed, If Thoughtfully Followed in the Order Set Down; Awaiting the Click at Each Turn (The Author, 1928). Horrigan states that the name "Dyxamion" was coined by publicists working for the Marshall Field's department store, where a full-size model of the 4D house was exhibited. Fuller is said to have swapped the name to Dyxamion as he liked the portmanteau of "dynamism" and "maximum."
23. Thomas S. Hines, *Richard Neutra and the Search for Modern Architecture: A Biography and History* (Berkeley, CA: University of California Press, 1994). Neutra's vision of the future was heavily influenced by the idea of mass-produced homes. The success of Henry Ford in producing more affordable cars through a streamlined workflow inspired a generation of "entrepeneur-architects" to speculate of the future of industrialized architecture and of "houses like Fords." Neutra, however, represents the opposite of Fuller, who invoked the future to imagine a house that was affordable for the masses thanks to the efficiency of industrial production. For Neutra the future was an item of luxury that appealed to his wealthy, style-conscious clients.
24. "Model House Open as Boon to Women;' Home of Tomorrow' Has 19 Built-In Motors to Do Work of 864 Maids," *The New York Times*, 16, Mansfield, Ohio, February 22, 1934; Westinghouse Electric Corporation, *Westinghouse Electric Servants for Today* (Pittsburgh, PA: Westinghouse Electric Corporation, 1934). The Westinghouse "House of Tomorrow" in Mansfield opened to great fanfare in February 1934. Horrigan quotes the phrase of 864 maids from an article published in Business Week. Another piece in the *New York Times*, dated 21st February, describes it as a "boon to women" and goes on to declare it the "new deal." The gendered narrative of servitude, comfort and convenience is reinforced in the brochure "Electric Servants for Today," produced by Westinghouse to promote their "amazing home laboratory" in which "*new and advanced electrical appliances (…) are thoroughly tested in actual service before being offered to you*."
25. Horrigan, "The Home of Tomorrow, 1927–1945," in *Imagining Tomorrow*, 156.
26. Douglas, "The Idea of a Home," 287.
27. bell hooks, "Homeplace: A Site of Resistance," in *Yearning: Race, Gender, and Cultural Politics* (New York: Routledge, Taylor & Francis Group), 41.
28. Lynn Spigel, "Designing the Smart House: Posthuman Domesticity and Conspicuous Production," *European Journal of Cultural Studies* 8 (2005): 404.
29. Thao Phan, "Amazon Echo and the Aesthetics of Whiteness," *Catalyst: Feminism, Theory, Technoscience* 5, no. 1 (2019): 1.
30. Strengers and Nicholls, "Aesthetic Pleasures and Gendered Tech-Work."
31. Eleanor Gibson, "Amazon to Develop Alexa-Enabled Prefab Homes," *Dezeen*, October 2, 2018. Available online: https://www.dezeen.com/2018/10/02/amazon-alexa-enabled-plant-prefab-homes/
32. Carl Franzen, "You Might Find Your Next Home on Amazon," *Quartz*, October 17, 2018. Available online: https://qz.com/1383672/you-might-find-your-next-home-on-amazon/ (accessed July 2, 2019).
33. Giulia Pacciardi, "Amazon House in a Box, Our Interview with Studio AMA Albera Monti Architetti's Founders," *Collateral*, April 11, 2019. Available online: https://www.collater.al/en/amazon-house-in-a-box-albera-monti-architetti/
34. Diane Wedner, "The All-Consuming Bills of an All-Electric Home," *LA Times,* August 13, 2001. Available online: http://www.greenspun.com/bboard/q-and-a-fetch-msg.tcl?msg_id=0063xf; Westinghouse Electric Corporation, *Westinghouse Plans Guide For Building a Total Electric Gold Medallion Home* (Pittsburgh, PA: Westinghouse Electric Corporation, Total Electric Home Department, 1957). When it was launched in 1957, Live Better Electrically was expected to sell almost a million all-electric homes by 1970 and the Edison Electric Institute estimates that

the goal was achieved alongside General Electric and Westinghouse's mission to increase electricity consumption and sales of their appliances nationwide. Westinghouse also used the campaign to sell homes by catalogue. The *Westinghouse Plan's Guide* invited its readers to use its sixteen designs as a template for their own. Sets of complete construction plans could be ordered for any of them. The back cover offers a detachable slip that could be mailed to order the sets and reassures readers the plans on sale, at $10USD for set, are "*Completely detailed plans—ready for your builder. The plans you will receive will be complete, including specifications and lists of materials, and ready for use*." Each design is intended to be as flexible as possible: "*You'll find that your Total Electric Gold Medallion Home is totally adaptable to every need your family might have… today, tomorrow or next year. The reason: an ingenious pattern of electric living centers inspired by the fact that electricity can do so much for you*."

35. The term "digital domesticity" has been used before by Harriet Riches in describing a revival of hand-made crafts, family and domestic life as part of a more fundamental desire for the slower pace and authenticity linked to pre-digital, daily life.
36. Tiny Chapman and Jenny Hockey, "The Ideal Home as It Is Imagined and as It Is Lived," in *Ideal Homes?: Social Change and Domestic Life*, ed. Tony Chapman and Jenny Hockey (London: Routledge, 1999), 1, 4.
37. Daniel J. Solove, "'I've Got Nothing to Hide' and Other Misunderstandings of Privacy," *San Diego Law Review*, 44 (2007): 745. Daniel Solove offers an excellent overview of the debate around privacy in the wake of the September 11th attacks in the United States. Solove argues that the event polarized the debate over privacy, often framed in terms of having "something to hide," These terms have been perpetuated in contemporary online privacy discussions, contributing to the normalization asymmetries in data collection and exploitation.
38. Abbas Raza, "Tech Philosophers Explain the Bigger Issues with Digital Platforms, and Some Ways Forward," *3 Quarks Daily*, 2021. https://3quarksdaily.com/3quarksdaily/2021/02/tech-philosophers-explain-the-bigger-issues-with-digital-platforms-and-some-ways-forward.html (accessed February 19, 2021).
39. Shannon Mattern, "Post-It Note City," *Places Journal*, 2020; Shannon Mattern, "A City Is Not a Computer," *Places Journal*, 2017.
40. Thacker, "The Science Fiction of Technoscience," 158.
41. Rem Koolhaas, "The Smart Landscape: Intelligent Architecture," *Art Forum*, April, 2015. https://www.artforum.com/print/201504/the-smart-landscape-intelligent-architecture-50735; Rem Koolhaas, *Elements of Architecture* (Germany: Taschen, 2018). Koolhaas discourse in *Elements* was articulated around the technologies that have made up architecture, our progressive dependency of them and the steady decline in architect's engagement with their complexity. The exhibition at the Venice Biennale surveys a wide range of technologies but following from this drive, Koolhaas engaged with digital technologies in a series of talks and articles, as seen in the article published in Art Forum to warn about the "*stealthy infiltration of architecture via its constituent elements*." True to character, it is difficult to understand Koolhaas' position with regards with these technologies. He sat down with Tony Fadell as part of the programme of talks of the Venice Biennale in 2014 to, at turns, laud him and distance himself from Silicon Valley's discourse.
42. Claudia Dutson, "Performativity and Paranoia: Or How to Do the "Internet of Things" with Words," in *Industries of Architecture*, ed. Thilo Amhoff, Katie Lloyd Thomas, and Nick Beech (London: Routledge, 2016).
43. Ant Farm, *Inflatocookbook*, 1971. https://web.media.mit.edu/~bcroy/inflato-splitpages-small.pdf; Catharine Rossi, "From East to West, and Back Again: Utopianism in Italian Radical Design," 2015; Alex Coles and Catharine Rossi,

EP 1: The Radical Italian Avant-Garde 1968-1976 (Berlin: Sternberg Press, 2013), I. The research of Catharine is an excellent introduction to the work of the Italian Radicals, but also of the utopianism in architecture groups in the Americas and Europe during the 1960s and 1970s.

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