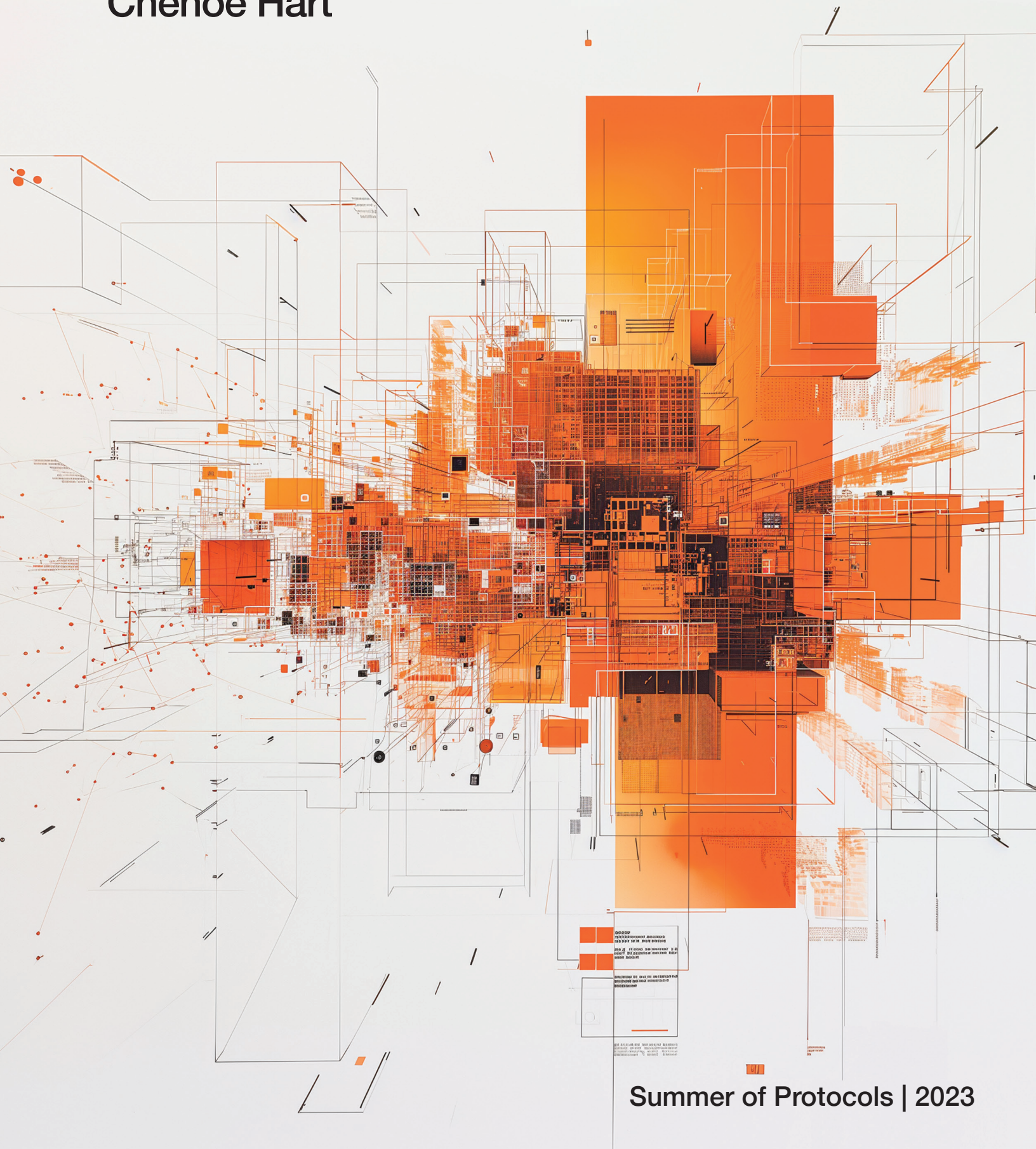
Addressable Space

Chenoe Hart



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Inquiries :: hello@summerofprotocols.com

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1. Hidden Floors

You may not notice in everyday life when a building you walk into is constructed of words and numbers in addition to bricks and mortar.

Consider the composition of One Burrard Place, a condominium in Vancouver. It was described as a 60-story building, but it contains only 54 physical floors. Its developers, in an effort to appeal to prospective residents from Chinese cultures where digits containing the number four—which sounds similar to the word for "death" in many East Asian languages—might be considered less desirable, skipped past floors in the building's floor count ending in four. The developers also omitted a number considered undesirable in western culture, floor number 13.

While the building was under construction in 2015, the city banned developers from omitting any floor numbers from their buildings, after fire safety concerns were raised about the potential confusion introduced by such alternative labeling schemes.[1]

The plan for a condominium proposed for construction in Manhattan in 2019 contained nearly twenty nonexistent floors. Tall buildings dedicate a handful of floors to house behind-the-scenes equipment such as elevator motors and HVAC machinery. But the first version of the 775-foot tall design proposed at 50 West 66th Street would have dedicated 192 feet of its total height to such mechanical spaces, and that count included one floor with a 160-foot-high ceiling.[2] The building's mechanical systems would have needed only a fraction of that open space, but the very tall floor allowed for apartments located above the void to offer desirable higher views. That and other similar proposals prompted the city to reevaluate its zoning laws[3] and the developers were approved to construct an alternative version of the proposal containing 64- and 48-foot-high internal voids instead.[4]

Whether a building's hidden floors are nonexistent or inaccessible, they are presented in a similar manner to visitors: as spaces concealed by information. A panel of elevator buttons symbolically depicts floors in a building; it does not convey the height from the ground of each floor. The buttons enumerate the floors as discrete standalone units, akin to digital information. And that information, abstracted away from analog reality, can then become more arbitrary; the numbers pointing to floors on an elevator's panel may convey a distorted representation of the number of floor slabs the building actually has. The information takes on an indirect relationship with the physical world in the same way that a website URL address does not reference the physical location of the server hosting it.

Like computers, where software programs use pointers to indirectly access data in physical memory, floors and apartments subject to abstract addressing schemes become randomly accessible. This system is similar to the chaotic storage of automated warehouses, where inventory items are placed in arbitrary locations instead of being grouped with similar objects.[5]

When we navigate physical space through digital abstractions,[6] like we do when

1. Jaehong Lee, "No More Skipping 4, 13, 14, 24 in Vancouver Floor Numbers," *Vancouver Sun*, November 4, 2015. vancouversun.com/news/local-news/no-more-skipping-4-13-14-24-in-vancouver-floor-numbers
2. Elizabeth Kim, "City Greenlights Tallest UWS Tower After Developer Tweaks 'Void.'" *Gothamist*, April 10, 2019. gothamist.com/news/city-greenlights-tallest-uws-tower-after-developer-tweaks-void
3. NYC Department of City Planning, "Residential Tower Mechanical Voids Text Amendment—DCP," 2019, accessed August 27, 2023. www.nyc.gov/site/planning/plans/voids/voids.page
4. Kim.
5. See Kei Kreutler's Summer of Protocols essay *Artificial Memory and Orienting Infinity* for a further description of how information is stored within both computer memory systems and automated warehouses. summerofprotocols.com/research/artificial-memory-and-orienting-infinity
6. Discussions regarding additional layers of abstraction used for organization and coordination within the built environment can be found in Drew Austin's Summer of Protocols essay *Protocols Don't Build Pyramids*. Many layers of abstraction operate outside the scope of this essay's focus on organizational schemes involving labeling and enumeration. summerofprotocols.com/research/protocols-dont-build-pyramids

pressing an elevator button or looking up a street address, we see the world in the same geographically neutral way that a computer might.[7]

This translation process might mean that information has to be made appropriately *legible*, to borrow a term from political scientist James C. Scott, in order to exist in a form capable of being processed by an abstract organizational system.[8]

2. Digital Rooms

Digital methods of organizing physical space emerged in the 18th and 19th centuries, as governments sought to develop methods to informationally comprehend their territories. House address numbers were introduced for purposes of tax collection and military conscription, allowing for, according to historian Anton Tantner, the interior of the house to become "transparent" to the state.[9]

Meanwhile, the adoption of corridors in governmental buildings streamlined internal passage, creating conduits that allowed for faster transmission of information within those organizations. As corridors aligned office and classroom doors in relatively equal relationships, they introduced a new architectural dynamic. Architectural theorist Mark Jarzombek suggested this alignment could exert an equalizing social influence, creating neutral common spaces for interaction among people of different backgrounds and social classes.[10] Distances between rooms mattered less than they had before.

Around that time, residential homes acquired a feature that we now take for granted: the idea of private rooms. Architectural theorist Robin Evans identified a progression towards enclosed rooms within Victorian households, in contrast to a earlier Italian Renaissance-inspired paradigm in which rooms opened up to each other. Evans described the interior experience of the Villa Madama from 1525 in Rome as rooms that could function like

> [. . .] an open plan relatively permeable to the numerous members of the household, all of whom—men, women, children, servants and visitors—were obliged to pass through a matrix of connecting rooms where the day-to-day business of life was carried on.[11]

Defined by Victorian norms of social separation, later British household spaces became more self-contained. Entrance was via a single door on one wall, leaving other walls closed off from their surroundings. We might perceive such an enclosed room as a discrete entity, a place where awareness of the external spaces and events occurring beyond its walls is not necessarily present. Those singularly identifiable rooms could then take on implicit names and associations regarding their functions and purposes. One room in a house might be called a dining room or designated as servant quarters.[12]

A room inside a home might not have an official label like those numbered along an institutional corridor, but an informational association was still involved. You were either allowed in a room or you were

7. For a further example of theories comparing non-electronic organizational systems with computing, see Markus Krajewski, *Paper Machines: About Cards & Catalogs, 1548–1929*, trans. Peter Krapp (Cambridge, Mass.: MIT Press, 2023).
8. See James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1999).
9. Anton Tantner, *House Numbers: Pictures of a Forgotten History*, trans. Anthony Mathews (London: Reaktion Books, 2015), chap. 1. press.uchicago.edu/ucp/books/book/distributed/H/bo22282433.html
10. Mark Jarzombek, "Corridor Spaces," *Critical Inquiry* 36, 4 (2010), p. 728–70. Jarzombek associates early corridor-based government buildings with more segregated relationships between citizens and governments, but such buildings still included deliberate provisions for the public to circulate within them (p. 753-8). doi.org/10.1086/655210
11. Robin Evans, *Translations from Drawing to Building* (Cambridge, Mass.: MIT Press, 1997), p. 63–65.
12. Flanders, Judith. *Inside the Victorian Home*. (New York: W. W. Norton, 2005), p. 9.

not; the room was either being used for its intended purpose or it wasn't. Such a room could be said to embody a binary spatial condition. By virtue of this binary nature, these spaces could also be metaphorically described as digital.

3. Cinematic Elevators

Elevators were introduced into buildings in the 19th and early 20th centuries. Their subsequent technological evolution enabled physical space to become, like modern computer memory chips, a randomly accessible medium. To access a floor in a high-rise building today, you push an electric button which has, like a memory address code, a discrete label of digits associated with it. That interface was a significant development beyond those of early elevators, which were manually controlled by operators using levers. Before, reaching the fifth floor once required holding down the lever for a longer duration than was needed to reach the third floor.

After the early 20th-century introduction of relays for semi-automatic analog electrical control, which regulated the elevator's speed when stopping at floors, the need for an elevator operator's hand crank—and the skill to use it—was gradually automated away.[13] In 1950 at the Atlantic Refining Company building in Dallas, Otis Elevator installed the first modern (sufficiently automatic to handle commercial traffic volumes) passenger-controlled elevators featuring panels with dedicated buttons for each floor like those we push today.[14] Accessing a high floor now involved the same amount of physical effort as a low one.[15]

Floors in residential buildings had once been described using hierarchical terms, which indicated their decreasing desirability as reaching them involved ascending more flights of stairs. The main level, where a house's owner resided, was called the *piano nobile*, and was accessible by two or three flights of stairs, while the cramped *garrets,* just below the roof, commonly housed servants. The elevator's arrival equalized the levels in a building, as now each was equally accessible.[16] It facilitated a more neutral way of describing floors by using numbers instead of names.[17]

In some cases, this system inverted older hierarchies, making the top floor into a more desirable *penthouse*. Either way, the journey to get there became artificially linear.

The experience of ascending a 10-foot floor or a 20-foot lobby within a windowless elevator car became relatively interchangeable, as the elevator passed each with equal ease. It could also bypass additional levels of space[18] located between its designated stops, like those of a stair landing or a conversation pit slightly sunken into a floor. The range of potential vertical spaces was reduced (or, in signal processing terms, *quantized*[19]) by the logic of the ele-

13. See Andreas Bernard, *Lifted: A Cultural History of the Elevator* (New York: NYU Press, 2014), p. 151–160.
14. Otis Elevator Co., *The First One Hundred Years* (Otis Elevator Co., 1953), p. 31–33. Otis more specifically described their automatic system as being able to assign passengers who called an elevator to the optimal elevator car based on current traffic flow in the building (p. 34). That type of adaptive routing would become more advanced as elevators acquired microprocessor-based controls in the 1970s and 1980s. archive.org/details/TheFirstOneHundredYears
15. Elevator rides can also be perceived as involving ambiguous durations of time relative to distance traveled, since elevators spend time accelerating and decelerating and since an elevator can make an unpredictable number of stops along its journey.
16. An analysis of a similar idea can be found in Preston Scott Cohen, "Successive Architecture," *Log*, 32 (Fall 2014), p. 154.
17. Distinctions between numeric and text-based information also occur in computer programming, such as with the difference between integer or floating point and string data types. This is a topic of potential future investigation.
18. Prior to the widespread adoption of the elevator, some prominent Modernist architects experimented with multi-level interiors; Adolf Loos developed elaborate walkable staggered *Raumplan* topographies inside his buildings, while Le Corbusier explored gradual pedestrian floor transitions via ramps.
19. Quantization can be described as a process of transforming continuous analog information into a series of discrete digital steps, for example in the way that a digital photograph is composed of discrete pixels. Within a building, the steps of a stairway

vator design. It limited the usable areas to a smaller set of levels, specifically the top surfaces of the slabs at which it was programmed to stop.

Passengers foregoing the stairs might miss aesthetically appealing opportunities to look down onto other floors from a mezzanine or to make a grand entrance into a room. The architect Philip Johnson once lamented that elevators disrupted the "whence and whither" of a continuous unfolding visual narrative which visitors might otherwise experience when walking through a building. The sense of surprise or delight one might feel when entering a new room or turning a corner could be diminished if the journey to get there had been interrupted by a disorienting elevator ride.[20]

From the less traditional perspective of the filmmaker-turned-architect Rem Koolhaas, the fragmented transitional experience of entering and exiting an elevator could instead be engaged with. Just as a movie may cut abruptly between footage of two different locations, leaving out mundane events outside of its main narrative, architectural spaces could similarly be designed to "connect episodes."[21] And in both mediums, the technique could be used to tell new kinds of stories.

For Koolhaas, the elevator's ability to grant independent access to any floor transformed each floor into a discrete enclosed zone, capable of harboring its own distinct thematic world. As with the enclosed Victorian rooms, those floors were able to take on greater degrees of information, as a result of each floor's isolation from its surroundings. Koolhaas found an exemplifying precedent for his ideas in New York City's Downtown Athletic Club built in 1930, within which disparate spaces coexisted on different floors inside the same 35-story building, including a boxing gym, a swimming pool, and a golf course.[22] The interior experience of a building could be, like footage recorded onto film, cut up and rearranged.

5. Informational Walls

We're told a story whenever we ride in an elevator that omits floors from the buttons on the panel. Omitted floors can be invisible to your awareness, unlike the way a closed door remains seen and known. An elevator's jumps through space create additional walls in a building, defined by information rather than physical space. Shaded-out areas of architectural floor plans can sometimes present the inaccessibility of physical barriers like walls and underground soil and unauthorized spaces like the interior of a neighboring building; similarly, spaces bypassed by an elevator could also be presented shaded-out with a color or pattern of impassable *poché*.

The world accessible from an elevator is like a movie set: you don't see the spaces behind the facades. Just as Hollywood movies edit everyday life into an idealized form, our interfaces for traveling through physical space can intentionally bypass inconvenient or undesirable locations, in a potential continuation of Victorian forms of spatial isolation.

Some real estate developers constructing new residential apartment buildings in cities where they are required to include affordable housing units have incorporated separate circulation systems for accessing those units. These buildings feature what journalists and commentators have referred to as *poor doors*[23]—separate entrances,

could be said to be quantized while a ramp was not. An elevator transports its riders between floors at a lower, blockier resolution of vertical travel than a stair with its in-between steps and landings.

20. Philip Johnson, "Whence & Whither: The Processional Element in Architecture," *Perspecta* 9/10, p. 168. doi.org/10.2307/1566915
21. Naomi Stungo, "Koolhaas and the Gang," *The Observer*, July 17, 1999. www.theguardian.com/theobserver/1999/jul/18/featuresreview.review1
22. Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan* (New York: Monacelli Press, 1997), p. 155.
23. The New York City local news website *West Side Rag* claimed it created the term in 2013, as part of its

lobbies, and elevator shafts for the affordable housing renters to access their units. One Riverside Park on New York's Upper West Side, the building that inspired the term poor door, required different journeys to access locations in its interior even though all of its units could have been easily accessed via a single bank of elevators.[24]

The poor-door practice was banned by New York State in 2015,[25] but continues in other places with tight real estate markets.[26] Other types of separate circulation systems were still being implemented in New York after the ban.

One building can informationally become two: Building 15 within the city's expansive Hudson Yards Development, for example, features two doors and lobbies which are connected together but located on different floors. The less prominent of those two entrances was associated with its own street address used on the application form for affordable units.[27] Giving the building's two entrances individual street addresses allowed for the income-segregated portion of the building to be informationally represented as a different building.

6. Duplicate Places

Other informational labels can make us feel like we are inhabiting multiple places at once in our minds or that different locations are the same. You may live in many different houses during your lifetime, yet call each one "home." In the commercial sphere, we recognize new locations of familiar retail chains via symbols we have seen in the past. In addition to selling familiar foods or products, those buildings will typically also have similar physical layouts since they are designed according to a standard store prototype. In the terminology of object-oriented programming, an individual location of a chain business could be called an instance of a class.[28]

When you enter an instance of a food chain like Chili's or a Starbucks, you know it will provide an experience consistent with your memories of other instances you've visited. You go through the motions of walking through its interior for the first time as though you were traversing the interior of that other remembered building.[29]

You also know what its interior will look like *before* you walk inside: Panera Bread will have soft benches and a Chipotle will have plywood and aluminum decor. You know in advance where to order, where to sit, and where the restroom is. Visiting a chain takes less mental effort than trying a new and unfamiliar restaurant. A chain is familiar territory in the same way your home or your office is. And indeed, that phenomenon is part of the business model which has made chains successful.

Today, technology may guide you more effortlessly to familiar places, since we are

coverage on the development of the One Riverside Park condominium in its neighborhood. See "'Poor Door' Building Now Taking Applications for Income-Restricted Apartments," *West Side Rag* (blog), February 18, 2015. www.westsiderag.com/2015/02/18/poor-door-building-taking-applications-for-income-restricted-apartments

24. One Riverside Park's developer, Extell Development, claimed that the building's configuration was a result of city regulations preventing other feasible alternatives. City officials also acknowledged that such design configurations were an unforeseen outcome of a 2009 change to their zoning code. See Mireya Navarro, "'Poor Door' in a New York Tower Opens a Fight Over Affordable Housing," *The New York Times*, August 26, 2014, sec. New York. www.nytimes.com/2014/08/27/nyregion/separate-entryways-for-new-york-condo-buyers-and-renters-create-an-affordable-housing-dilemma.html
25. Ahiza Garcia, "'Poor Doors' Banned in New York," *CNN Money*, June 30, 2015. money.cnn.com/2015/06/30/news/poor-door-banned-new-york/index.html
26. Issac Muk, "How Housing Segregation Continues to Shape London for the Worse," *Huck*, August 4, 2023. www.huckmag.com/article/conditions-of-living-exhibition-exploring-housing-segregation-in-london
27. NYC Housing Connect, "Affordable Housing for Rent: 553 West 30th Street," NYC Housing Connect, n.d., accessed September 3, 2023. www.residenewyork.com/wp-content/uploads/2018/12/553-west.pdf
28. This statement is meant to suggest that both systems share similar morphologies in terms of operating via local variations (instances and individual stores) of a global model (classes and prototype store plans), and not that the systems are directly or completely analogous.
29. Additional discussions of the role of memory in navigating buildings can be found in Kei Kreutler's Summer of Protocols essay *Artificial Memory and Orienting Infinity*. summerofprotocols.com/research/artificial-memory-and-orienting-infinity

likely to search a digital map for places with names we remember. When asking a GPS to direct you to the nearest location of a chain, as long as no errors occur, you don't need to know the destination's address or recognize its surroundings any more than you'd need to know where a website's physical server is located. And like websites, we might bookmark places in the world around us, artificially prioritizing them over their surroundings. The more you focus on the dots and lines on a digital map instead of your surroundings, the more your travel starts to resemble an elevator ride. You bypass the experience of the spaces between your journey's start and end.

When our movement through physical space becomes sufficiently abbreviated, it no longer involves travel at all. You can order delivery from a restaurant you might never visit in person. You can summon a ridesharing driver to take you "home" (a place that you might well have bookmarked on your phone) from anywhere in a city without knowing the navigational steps involved.

Like the hidden floors in an elevator building, new spaces concealed by uneven access to information exist in our cities. One example is the "cloud" or "ghost" kitchens providing food-delivery services. With their growth catalyzed by the Coronavirus pandemic, these kitchen-only, online-only cooked meal providers had no need for the costs associated with providing seating. Sit-down restaurants were forced to scale back to meal pick-up and delivery, rendering their in-person experiences temporarily obsolete.

Cloud kitchen brands can also be deployed to manipulate information about the offline world. In the spring of 2020, consumers who saw Pasqually's Pizza appear as an option on their delivery app, if they read the company's promises of "fresh ingredients" and "handcrafted pizza crusts"[30] might have imagined they were buying from a local business.

Behind the scenes, though, their pizza was made by the large food and amusement chain Chuck-E-Cheese.[31] Small print on the Pasqually's website noted that it was owned by CEC Ent. or CEC Entertainment. A CEC representative acknowledged that its goal was to offer "a more flavorful, more premium pizza experience" from their regular child-oriented brand, despite its pizzas being made in the same kitchens.[32] The food was being ordered and delivered as though it had come from somewhere else.

7. Virtual Worlds

When physical spaces overlap, they can start to exhibit traits typically found in virtual spaces. Travel can resemble teleportation instead of walking. One example of how information governs access to virtual space can be found in the game designer Michael Nitsche's description of the *Cube Club* level of *Common Tales,* a virtual storytelling experiment:

> … two opposing doors from one virtual room lead to similarly opposing doors in a different room. When an avatar leaves the first room through the northern door, he or she will enter the seemingly adjacent second room, also through the northern door—the same way the southern doors are connected. Both rooms occupy the same logical space—a physical impossibility.[33]

The connectivity of the game space originates from how it is loaded by the computer,

30. "Pasqually's Pizza & Wings," CEC Entertainment, 2020, accessed August 28, 2023. www.pasquallyspizza.com/
31. Ben Coley, "Chuck E. Cheese Is Serious About Pasqually's Pizza & Wings," *QSR*, July 2020. www.qsrmagazine.com/fast-food/chuck-e-cheese-serious-about-pasquallys-pizza-wings
32. Alicia Lee, "Some Chain Restaurants Have Turned to Food Delivery Apps but They're Hidden behind Different Names," *CNN*, May 22, 2020. www.cnn.com/2020/05/22/us/grubhub-chuck-e-cheese-pasquallys-applebees-restaurants-trnd/index.html
33. Michael Nitsche, *Video Game Spaces: Image, Play, and Structure in 3D Worlds* (Cambridge, Mass: MIT Press, 2008), p. 85.

leveraging the computer's ability to link disparate pieces of information and enabling the arrangement of locations within a game level without a "spatial connection" between their data files. This teleportation provides game designers with what we might interpret as a Koolhaas-esque opportunity to, in Nitsche's words, "interlink" game spaces "in any way."[34]

The *Common Tales* player's instant journey might have been physically impossible. But like an elevator ride, it still involved bypassing a space located between two other spaces.

In the game, the player entirely avoids traveling through the omitted space, at least during that particular moment of gameplay, while an elevator rider might unknowingly travel through omitted spaces. If such a jump between two virtual rooms were to involve a period of waiting while the new room loaded, then that act of waiting might be comparable with time spent during an elevator ride.

Nitsche, like Koolhaas, turned to the concept of montage as a reference point when constructing his virtual spaces, employing the same term when discussing the capabilities of game design as a medium. The use of editing to connect scenes in either a game or a film could, "generate impossible but meaningful virtual structures" and support "the creation of coherent space, even if there is none."[35]

8. Reverse Skeuomorphism

As our physical spaces start to mirror facets of digital worlds, including abstraction, random-access convenience, and arbitrary barriers, methods of navigating these physical spaces increasingly resemble those we use for accessing despatialized digital information. Cars featuring sophisticated driver assistance and navigation systems[36] commonly have many of their controls accessible via touchscreens instead of physical buttons.

Many modern elevators also use touchscreen interfaces, allowing users to input floor destinations by typing, much like a phone number, or by swiping through options, like icons on a smartphone. In some cases, the process is made even more seamless when a visitor's destination is automatically retrieved from a scanned barcode beforehand. Some elevator interfaces even block unauthorized visitors from floors by displaying lock icons over their floor numbers on-screen, presenting the floors like protected digital files.[37]

Such resemblances may be intentional. The website for the elevator manufacturer Schindler, for example, proclaims that their PORT control system follows "the latest design and tech trends" by incorporating "touch screens that swipe (not scroll)."[38] Schindler manager Nicole Saloio, writing in a *Facilities Management Journal* article, noted a symbolic connection between elevators and phones in the design of first-generation computerized elevator interfaces, which required passengers to dial in floor numbers on a physical button keypad:

> The popularity of touch-tone phones mixed with the shrinking size and cost of computer technology meant that the system could overcome the learning curve of a keypad on the outside of an elevator in a user-friendly, cost-effective interface.[39]

34. Nitsche, p. 119.
35. Nitsche, p. 117–121.
36. Paul Stenquist, 2021, "The Future of Car Navigation Has Arrived," *The New York Times*, February 25, 2021, sec. Business. www.nytimes.com/2021/02/25/business/GPS-car-systems.html.
37. For an example see ThyssenKrupp's AGILE destination dispatch system. ThyssenKrupp Elevator, "AGILE Destination Controls," accessed December 27, 2023. www.tkelevator.com/media/products_1/agile/brochures_5/agile-dsc-design-center-elevator-brochure-ea-en.pdf
38. Schindler Elevator Corporation, "Schindler PORT," accessed August 24, 2023. www.schindler.com/en/elevators/destination-control/port-elevator.html
39. Nicole Saloio, 2010, "The Evolution of Elevator Technology," *Facility Management Journal*, December 2010. www.schindler.com/content/dam/website/us/docs/media/reprint/fmj-evolution-destination-technology.pdf/_jcr_content/renditions/original./fmj-evolution-destination-technology.pdf

Computers became widely adopted by the general public after their software interfaces began mimicking objects in the physical world, in an approach known as *skeuomorphism* and exemplified by designers referencing a physical desktop as a metaphor through which users could manipulate the computer's file system. Today, we are witnessing a pattern of reverse skeuomorphism, where our offline physical world starts to resemble not only the external interfaces of a computer's hardware but also the underlying logic of its software. A name or a number is an addressable piece of data.

As our world becomes increasingly automated, networked, and sensor-filled, our levels of awareness regarding the invisible interfaces, processes, and protocols through which computers comprehend our world will translate into a new awareness of physical space. Our digital literacy will enable us to retain a sense of effective agency as we design and navigate what is a new category of virtual worlds operating (through the assistance of automation) within the medium of physical space. If you travel far enough in an elevator, you might eventually reach the sky of a Windows desktop background filled with pixelated clouds.

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hello@summerofprotocols.com

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