Noticing Utility Poles:
A Visual Study of Infrastructural Materiality in Southeast Louisiana

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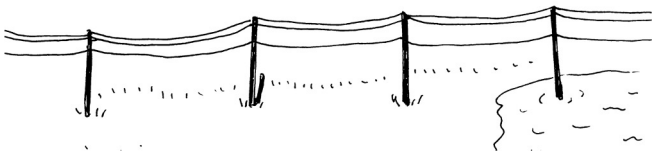
ABSTRACT
In this pictorial, I use noticing as a place-based practice to attend to intertwined material, social, political, and temporal dimensions of computing infrastructures. Drawing on visual ethnographic fieldwork in coastal southeast Louisiana, I draw attention to utility poles, an everyday infrastructural form through which electrical and telecommunications networks are installed and maintained. In coastal communities, storms and floods can impair existing aging infrastructure, while what gets restored and updated reflects longer legacies of uneven development. Through images paired with vignettes, I show how connectivity is materially tethered to place, shaped by access, labor, extractive histories, and changing landscapes. The pictorial contributes a visual method for understanding computing infrastructures in the context of ongoing climate and environmental crises, and offers ways of understanding and designing infrastructures from situated perspectives.

Author Keywords
pictorial; noticing; infrastructure; visual ethnography; climate change; coastal communities; materiality

CSS Concepts
• Human-centered computing; • Human computer interaction (HCI); • Empirical studies in HCI;



INTRODUCTION
In southeast Louisiana, the infrastructures that support digital life are becoming more vulnerable to climate disruptions. Most telecommunications and electrical networks across this region are installed above ground, with lines aerially tethered to utility poles. This configuration reflects economic and geographic constraints, including the high cost of burying cable in low-lying areas. As a result, utility poles and the attached lines are acutely exposed to hurricanes, flooding, and erosion leading to network outages. By noticing utility poles in this context, I ask what these ordinary structures can reveal about the situated materiality of computing infrastructures and their entanglement with landscapes shaped by climate volatility and extreme weather events.

Infrastructures are often considered as invisible, operating unnoticed in the background until moments of breakdown [31]. Yet such breakdowns are becoming more commonplace in the context of climate change, with prolonged outages and blackouts resulting from storms and wildfires [3, 11, 12, 19]. At the same time, the rapid expansion of AI and data-intensive infrastructure raises pressing questions about how energy, water, and other resources should be allocated [7, 10, 14, 18]. For HCI and design communities, these situations call for a renewed attention to the material and place-based foundations that support digital technologies [21]. Rather than calling for ever more robust or efficient systems, these conditions invite ways of attending to infrastructure as it exists in its fragile and exposed states.

In recent years, *noticing* has been taken up within HCI and design research as one such method. The method builds on anthropologist Anna Tsing's call for an "arts of noticing," an invitation to attend to the unruly entanglements that characterize life in a time of precarity [33]. Within design, this turn to noticing can also be understood as a response to the limitations of dominant approaches which often rely on progress narratives and technological fixes [23]. These approaches assume and promise control which often fail to address the complexity of intertwined social, political, and ecological challenges. In contrast, noticing foregrounds attentiveness to the multiple worlds that exist simultaneously, often by stepping out of familiar frames of reference and expertise. Prior work in HCI and design has used noticing to challenge anthropocentric assumptions in design by fostering new relations with the more-than-human world [4, 5, 20, 22]. Noticing is also understood as an attentional practice grounded in multisensory forms of observation [24, 26].Within media studies, science and technology studies, and arts-based practices, examining the material qualities of infrastructure has served to cultivate new relations to ubiquitous technologies that pervade our everyday life [27]. Approaches include guides and infrastructural walks to draw attention to the networked objects that fill environments [8, 25, 34]. Building on these strands, this pictorial turns to noticing utility poles as a way of learning from infrastructure in a time of climate instability.

Method
This pictorial draws from ethnographic fieldwork research in southeast Louisiana between February 2022 to October 2024. This study is part of a broader project to examine the impacts of climate change on networked infrastructures in coastal communities. Photographs were taken on an Olympus OM-D E-M10 Mark IV and an iPhone 13 mini. Additional data comes from interviews with utility workers, government employees, and residents on related topics; and field notes from participant-observation activities that include regulatory and policy meetings and ride-alongs with utility workers.

From a total of 1094 photos taken during fieldwork, 58 photos were selected for their focus on utility poles. These photos were imported onto a Miro board, where photos were then analyzed based on dominant visuals and clustered according to shared themes [6]. Subsequent photos were selected for their visual and narrative cohesion. Each theme was then paired with a vignette and hand-drawn sketch that drew from interview and field notes to describe and situate the images in the context of infrastructural materiality.

Noticing as Access

Figure 1: Leaning Pole, 2022

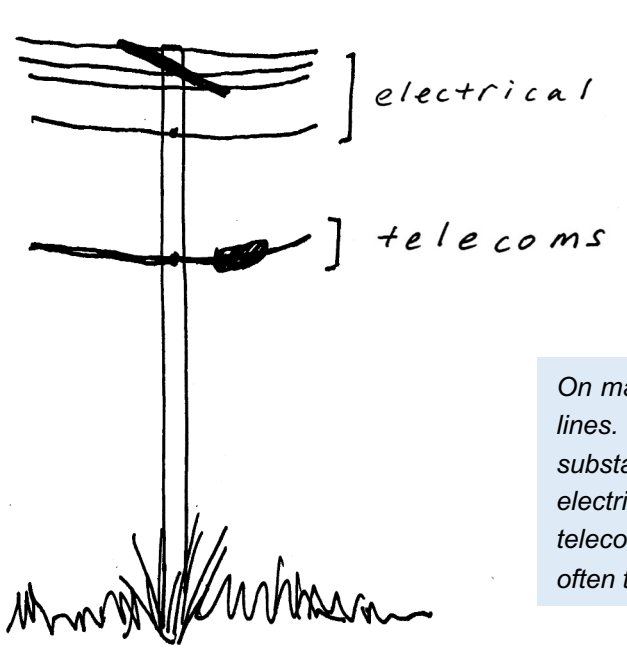
Figure 2: Pole in Water, 2022

Noticing as Access: *Utility Poles as an Entry Point to Infrastructure*

I first began noticing utility poles during a moment of fieldwork desperation. In an early field note from February 10, 2022, I noted how my e-mail inbox remained empty as potential contacts, leads, and interlocuters fell through and led to seemingly dead ends. Getting access to infrastructure was hard or at least getting people who worked on them to talk about it. Many people cited NDAs, business risks, and security concerns. That same day I decided to drive to the southernmost point that one could drive to along the Mississippi River to quell my anxiety. Along the way, I began to take note of utility poles and other networked infrastructures that towered above the marshlands, seemingly out of reach to me as a researcher. I pulled over several times, finally making use of the camera that I had purchased for research. If I had no control over who would respond to my emails, at least I could take photos, where I created my own form of infrastructural access by placing utility poles at the foreground.

Once I started noticing utility poles, I couldn't stop. The practice of taking photos of poles continued during my days off from fieldwork, when I would notice how they leaned and took up space (See Figures 1, 2 and 3). When fieldwork started to pick up, poles filled my camera roll after a long day. On one trip, I was ecstatic to spot a very tall utility pole covered with wires, signaling where multiple electrical utilities overlapped in their service territory (see Figure 4). Utility poles became a way for me to see where and how computing infrastructures live in the world, and how questions of digital governance materializes in our landscapes.

Figure 3: Pole and Sidewalk, 2022



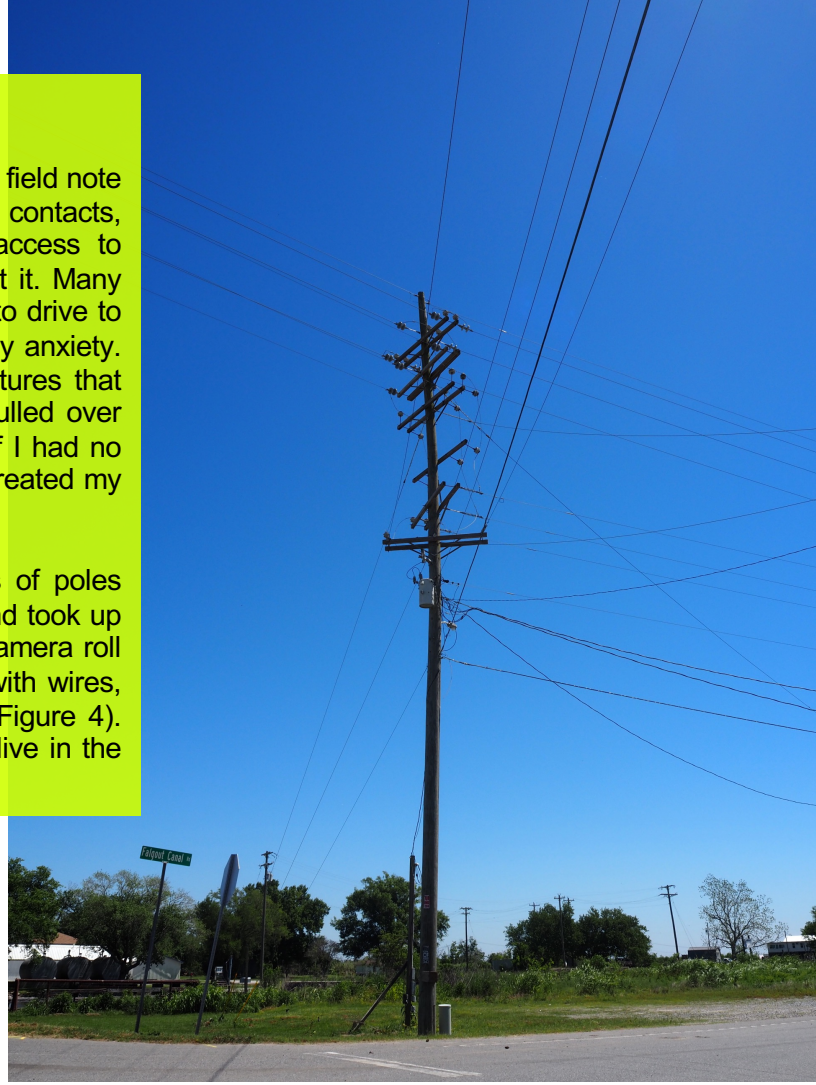


Figure 4: Pole with Lines from Multiple Utilities, 2024

On many utility poles, the top set of wires are the electrical lines. These multiple lines include high voltage wires from substations, and the lower voltage wires that carry electricity to residential and commercial spaces. The telecommunications lines, such as fiberoptic or cable are often the lowest wires installed on a pole.

Noticing Craft as Care

Figure 5: Pole with Line Worker Under Umbrella, 2022

Figure 6: Pole with Dried Clay at Base, 2022

Noticing Craft as Care: *The Work of Maintaining Utility Poles*

In September 2022, I accompanied line workers to observe the installation of a new line across a former sugarcane field into a new housing development. I stood at a distance to try to get photos of them adjusting the tension of the lines across all the poles. I could barely see through the viewfinder as sweat ran down my face. It was 98° F (36° C) and the humidity was probably just as high. The line workers on the poles were covered from head to toe, wearing heavy work boots, a helmet, and thick gloves. As one line worker told me, on particularly hot days, you can pour out the sweat that collects at the fingertips of the insulated gloves. Working in the heat was a part of the job, where there can be limited protection from the elements (see Figure 5).

Utility poles became a shared language between me and the utility workers I interviewed and accompanied on ride-alongs. A few times while driving, they would change our route while mentioning how I would probably want a picture of a particular utility pole. They were correct. The utility workers' noticing of utility poles often reflected a sense of pride in their work. I learned that there was an "art" to how each pole is buried depending on where the installation is taking place. Sometimes the earth where the pole is placed is a thick clay. Once installed, the clay bakes in the heat to create a hardened, tough base around the pole (see Figure 6). When poles are installed on less stable ground, such as in marshes or swamps, the workers will use guylines or lash another pole at the base for additional support (see Figure 7). Other configurations were the result of adaptations to cross waterways or other features that the infrastructure intersected. For example, near a canal, a utility pole was raised to allow for adequate clearance between the lines and passing ships (see figure 8). Paying attention to poles reveals these carefully considered negotiations between place and material.

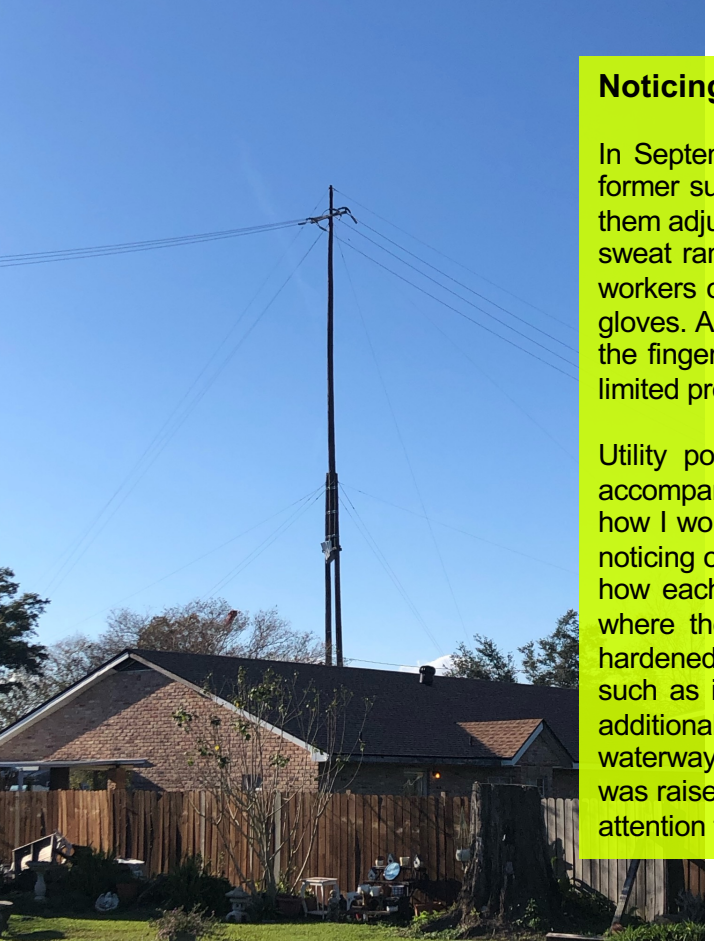


Figure 8: Tall Pole Over Canal, 2023

On a ride-along, a line worker showed me where the section of a broken pole had been carefully cut out with the telecommunications line still attached so that what was left of the pole hung in midair. The pole had been replaced by the electrical utility and this remaining line still needed to be moved by the telecommunications worker as part of the agreement of how the poles are managed.

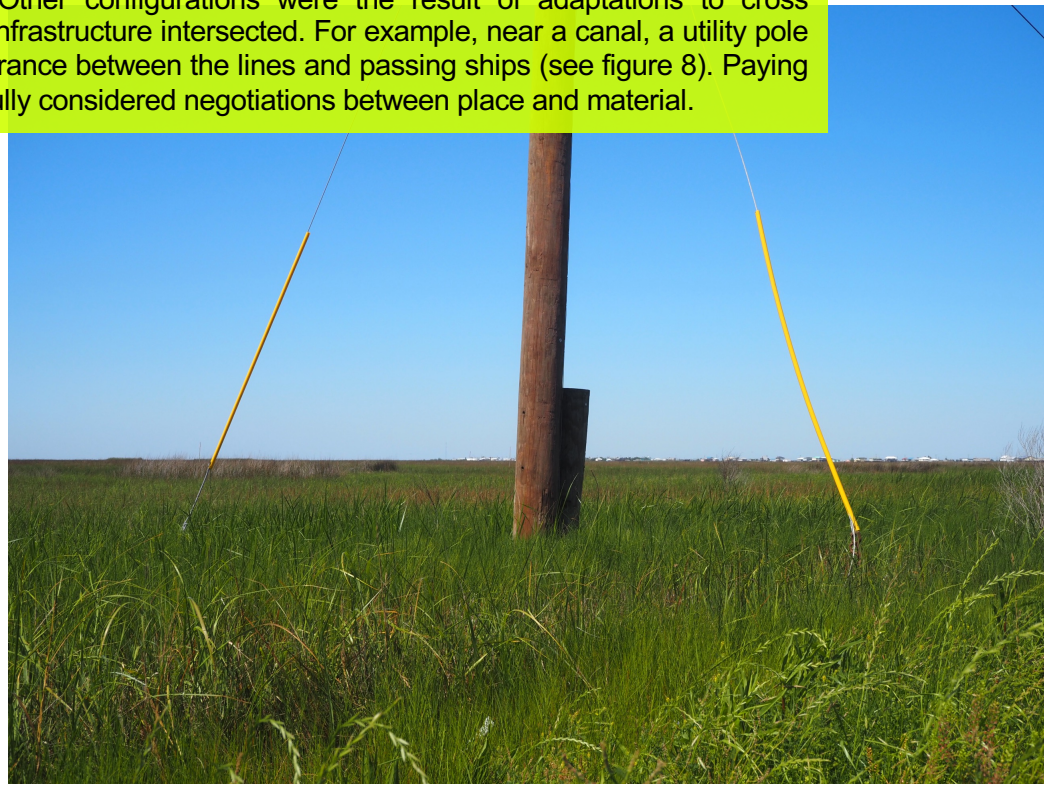
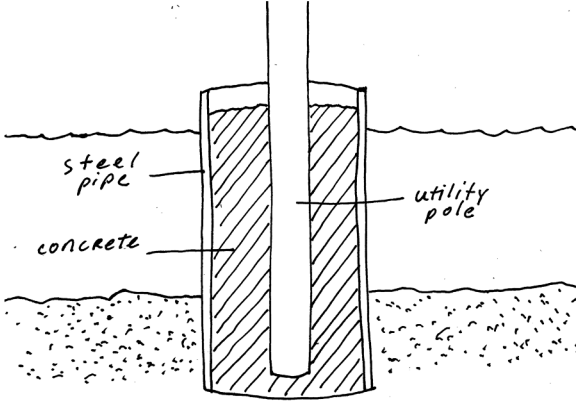


Figure 7: Pole with Guylines and Lashed Base, 2024

Noticing Shifting Landscapes

Figure 9: Pole with Steel Caisson, 2024



Cross-section of a steel caisson holding a utility pole. The utility pole is placed in a steel pipe that is sunk into the ground through water. Concrete keeps the pole in place, while the pipe keeps the pole dry and standing in hurricane winds.

Figure 10: Old Poles and New Poles, 2022

Noticing Shifting Landscapes: *Reinforced Utility Poles Along the Coast*

On a follow up field work visit in 2024, I hitched a ride with friends who were heading to Grand Isle for a day of bird watching. I was interested in seeing a major grid reinforcement project that had been completed there months earlier. These efforts were part of rebuilding the island after facing significant damage from Hurricane Ida in 2021. From the backseat window, I spied a billboard for an internet service provider company that read “Internet as mighty as the Mississippi River.” Over the course of thousands of years, the Mississippi River has snaked back and forth across what is now the southern portion of the state of Louisiana, creating deltaic land in its meandering path, including the narrow barrier island that is Grand Isle. Since European colonization, levees and other infrastructures have been built in an attempt to freeze the river in its current place, halting the growth of land and creating vulnerable environments that are prone to erosion and flooding.

We stopped by the side of Highway 1 approaching the island. Utility poles stood in a channel of water that ran parallel to the road. At the base of each pole was a steel caisson created from segments of an unused pipeline and filled with concrete and gravel. The utility company had estimated that this reinforced structure could withstand up to winds of 150 miles (241 km) per hour (see Figure 9). At the southern edges of the state, similar projects are undertaken to bolster and rearrange lines. Near a canal, poles installed following Hurricane Ida are moved closer to the road as the land increasingly begins to give way to water (see Figure 10). A few miles away, utility poles are wedged into rock pilings on Island Road, the one road to Isle de Jean Charles (see Figure 11). This reinforcement project took place shortly after the Indigenous community on the island had undergone a contentious relocation further inland, where some members of the community saw this project as a way for the state to redevelop their land for tourism [16]. Noticing poles in this context draws attention to the reinforcement plans that factor into which places will remain accessible in the years to come.

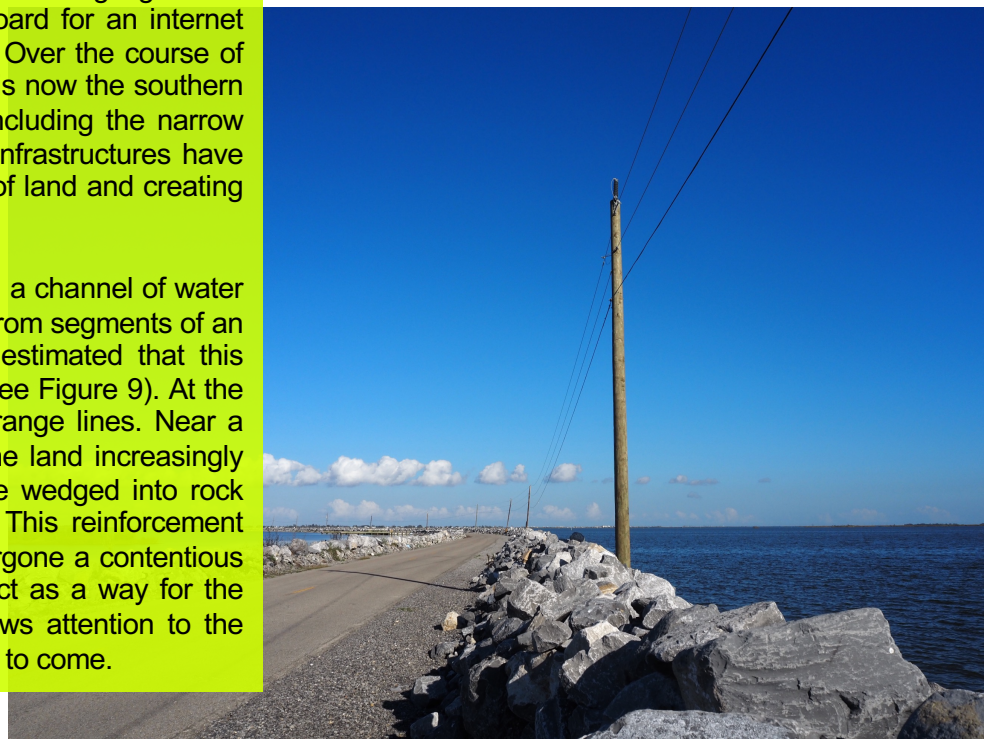


Figure 11: Pole on Rocks, 2023

Noticing Extractive Legacies

Figure 12: Pole Outside Facility, 2022

Figure 13: Pole Inside Facility, 2022

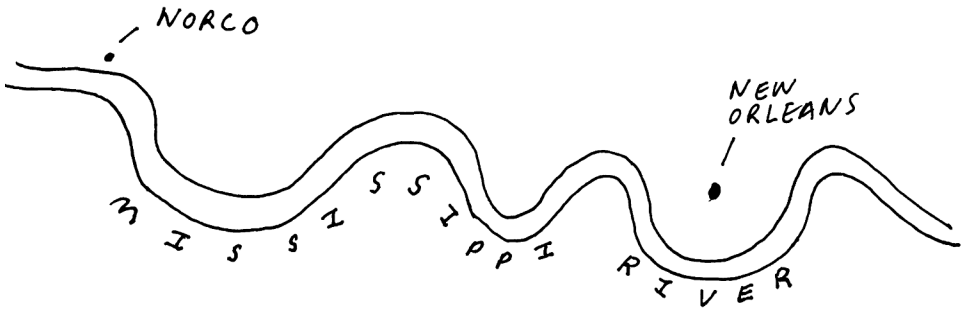
Figure 14: Pole with Streetlight, Camera, and 5G Antenna, 2023

Noticing Extractive Legacies: *From Rural Petrochemical Sites to Urban Surveillance Networks*

On some days, the air in Norco, a small community upriver from New Orleans, smelled disturbingly sweet. On other days, the air smelled greasy, like a basket of fries. On other days, it just smelled terrible. As part of my fieldwork, I regularly volunteered for an environmental justice bike tour that included several sites near petrochemical facilities, many of which sit on former plantations that once lined the Mississippi River. The tour traced longstanding efforts of historically Black fenceline communities to resist environmental racism from oil and gas companies. We were often close enough to facilities to smell the chemicals wafting through the air that residents encounter on an everyday basis.

During my repeated visits to the area, I noticed how utility poles tethered lines that crossed the barbed wire fences that separated petrochemical facilities from the surrounding communities (see Figures 12 and 13). These poles bring power and communication service to communities, while also powering the facilities. Across parts of south Louisiana, the development of the electrical grid was spurred by the growing petrochemical industries. These facilities use enormous amounts of electricity to process oil and gas, while surrounding communities deal with aging and precarious electrical grids that seem to decline with each passing storm.

This presence of poles in service of extraction can also be spotted downriver, as part of a citywide surveillance program. In the French Quarter neighborhood of New Orleans, the lack of wooden utility poles is due to investments to bury cables underground to preserve the historic appearance and tourist appeal of this neighborhood. On metal poles made to resemble antebellum cast iron lamp posts, additions such as 5G antennas and networked cameras have been attached (see Figure 14). Some of these cameras are operated by Project NOLA, a nonprofit that manages a network of thousands of cameras across the city and provides data to law enforcement. This data includes facial recognition technology, which is shown to have significant racial bias and has resulted in disproportionate misidentification and false arrests for people of color [17]. Noticing utility poles within here shows the ways that infrastructures are embedded in extractive regimes.



Norco is located about 25 miles (40 km) west of New Orleans along the Mississippi River. Although Norco is smaller and more rural than New Orleans, both places are shaped by shared histories of extractive economies rooted in chattel slavery.

Noticing Beyond Utility

Figure 15: Covered Pole, 2023

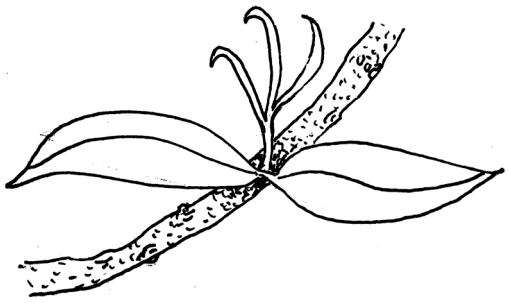
Figure 16: Pole with Growth on Top, 2023

Noticing Beyond Utility: *Cat's Claw and the Transformation of Poles*

At first glance, a strange creature appears to be a lurking on the corner of the street, a light emanating from a shroud (see Figure 15). Upon closer inspection, a utility pole has been consumed, overtaken by an overgrowth of spindly branches and leaves. This plant is known locally as cat's claw (*Dolichandra unguis-cati*), a climbing woody vine named for their sharp three-pronged tendrils that can grasp and cling onto structures. Cat's claw is native to Central and South America and was brought to southeast Louisiana originally as an ornamental plant sometime in the 20th century. In the springtime, the vines produce bright yellow trumpet-shaped flowers. However, they have since become seen as a nuisance by gardeners. Cat's claw can rapidly overtake a landscape by smothering existing vegetation in its path. Removing the plant takes dedication: one must first trim back all the growth, before digging into the ground to excavate all the tubers. If any roots persist, the cat's claw will come back next season. Cat's claw is thus often associated with neglected or abandoned spaces, where structures overrun with these vines signals a lack of routine maintenance.

Yet cat's claw can also be transformative, creating new forms in the landscape (see Figure 16). On a street in the 7th ward in New Orleans, I would often pass by such a hybrid. The cat's claw had grown into a dense heavy coat, spreading from the sides of the chain linked fence, covering the utility pole and the lines on either side (see Figure 17). The growth was carefully trimmed so that it formed a shaded canopy over a length of sidewalk. A plastic chair sat underneath this shade, offering a cool place for a passerby to rest, a respite from the heat.

What is the utility of a utility pole? In their original conception, utility poles were designed to function as a support for elevated electrical and communication lines. Yet as they have proliferated across the modern landscape, they take on new unexpected roles as they become embedded in the landscape. In this case, the poles become a trellis for new urban topiary, however precarious. Noticing these poles-with-cat's-claw nudges us to think beyond the designated uses of infrastructure, and their potential to form new relations and possibilities.



Close up of a three-pronged tendril on the vine of the cat's claw. These sharp points of the tendrils can grip onto wooden surfaces, allowing the vine to climb and spread.

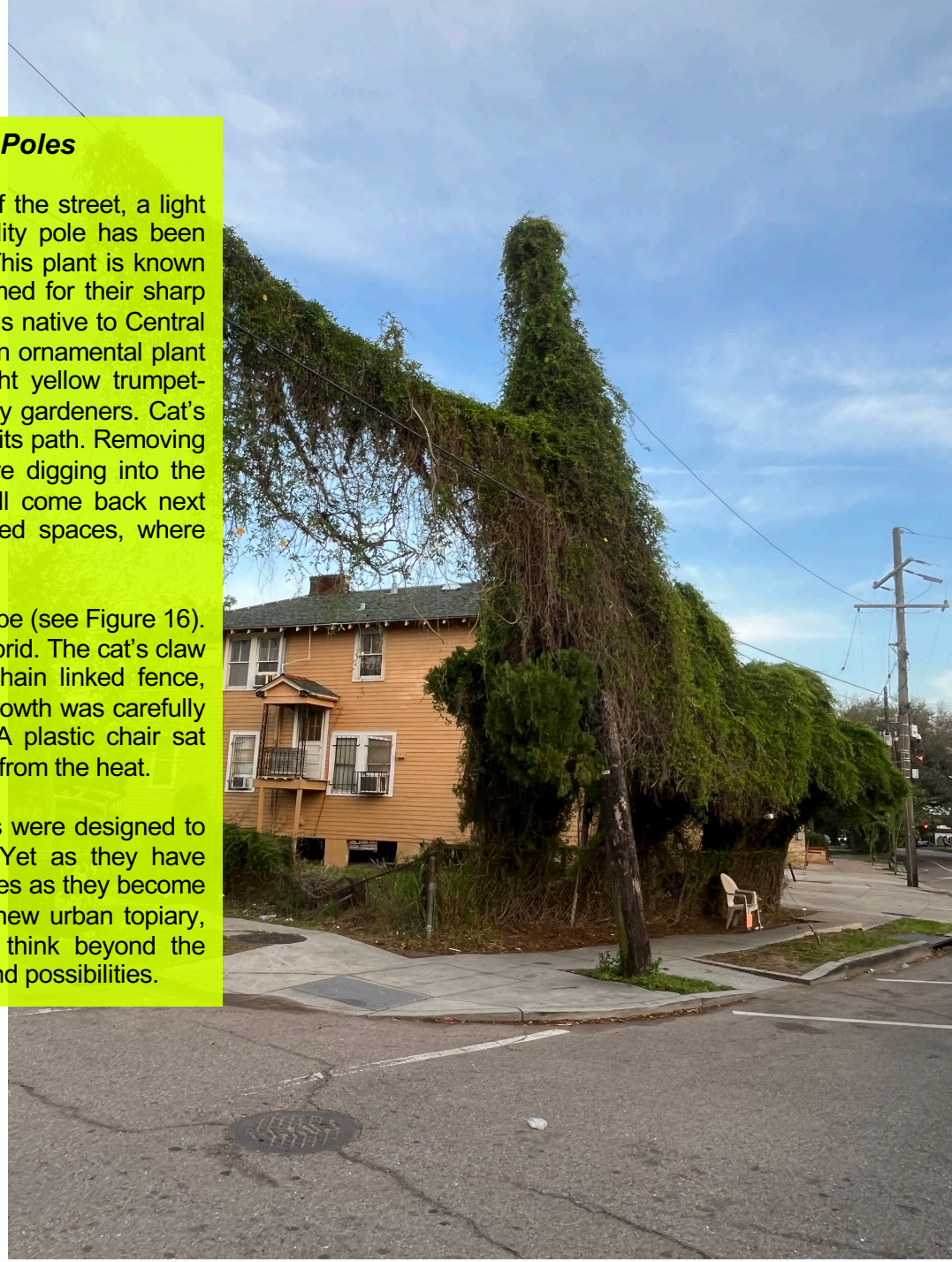


Figure 17: Cat's Claw Canopy Pole, 2023

DISCUSSION

In this pictorial, I use noticing as a method to engage computing infrastructure as sites of design already in progress, where labor, climate, extraction, and place converge. By attending to utility poles in southeast Louisiana, this pictorial foregrounds the material, environmental, and social conditions that sustain digital connectivity while rendering its fragility visible. This pictorial suggests two main implications for HCI and design research. First, it calls for greater attentiveness to the material and place-based foundations of computing, particularly as climate change renders infrastructures more vulnerable. Second, it positions noticing as a method for engaging infrastructures without defaulting to solutionism. Rather than asking how to fix or optimize systems, noticing asks designers to learn from fragile and contested infrastructures.

What Noticing Utility Poles Makes Visible

Noticing utility poles in southeast Louisiana reorients infrastructure as a situated material practice. Rather than appearing as static supports for connectivity, poles are continually adjusted, reinforced, repurposed, and entangled with local material conditions. These interventions reveal infrastructure as something that must repeatedly contend with the specificities of the environment, whether by utility workers or residents.

The cases also point to climate instability as an ongoing condition rather than a discrete event. Hurricanes, floods, extreme heat, and subsidence appear as recurring forces that structure everyday infrastructural life. Line workers labor under dangerous environmental conditions, while poles are reinforced to delay collapse. In this context, infrastructures are maintained with the expectation of disruption. At the same time, noticing reveals moments where infrastructure exceeds its intended function. Poles overgrown with cat's claw and repurposed to provide shade complicate narrow definitions of utility, opening space to consider how infrastructure participate in more-than-human relations and landscapes [1].

Noticing utility poles also makes visible the uneven development of infrastructures [13]. Poles traverse boundaries between petrochemical facilities and residential neighborhoods, powering extractive industries while surrounding communities experience declining grid reliability. The work of reinforcing poles or disguising network components in historic districts contrast sharply with exposed and aging infrastructures elsewhere. These differences reveals how questions of infrastructural connectivity are shaped by political and economic investments that impact how, and if, places come back online after climate-related breakdowns [35].

Noticing Infrastructure as Intervention

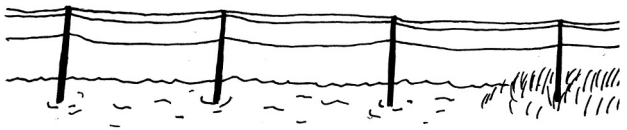
This pictorial contributes to broader conversations about noticing as a methodological and political stance within HCI and design research [24]. Noticing became a way to foreground how computing infrastructures are shaped by their environments [9]. The utility pole becomes a record of accumulated decisions that reflect how connectivity persists in a changing landscape. This perspective complicates common imaginaries of infrastructure as invisible or placeless, instead situating it as materially grounded [28, 29, 32]. Utility poles are continent upon social, environmental, and historical relations, rather than isolated infrastructure. Noticing becomes a way to examine how design practices might reckon with the limits of control in the context of multiple crises [30].

Taken together, the cases challenge dominant narratives of permanence that often shape design and computing research. The utility poles documented here reveal infrastructures that persist through care and compromise [13]. Overgrown poles repurposed as shade and patched networks following repeated storms all point to futures that are sustained through active efforts. By attending to infrastructure in its fragile and unfinished states, noticing positions design as a practice of working with uncertainty. It opens space to question what kinds of futures are being sustained, at what cost, and under what conditions, where "only an appreciation of current precarity as an earthwide condition allows us to notice this – the situation of the world" [33:4].

As a methodological practice, noticing infrastructure complicates dominant invocations of resilience in climate and design research. Resilience often suggests an ability to withstand disruption and bounce back, yet the reinforced poles and recurring repairs observed here reveal continuity as something unevenly sustained through constant labor and exposure to risk. Framing these conditions as resilience risks masking whose work, whose environments, and whose bodies absorb the costs of keeping systems operational. This critique invites HCI and design to reconsider how resilience discourse can depoliticize infrastructural vulnerability by presenting persistence as s success without examining underlying structural conditions.

CONCLUSION

Through sustained attention to utility poles in southeast Louisiana, I suggest a shift away from designing for imagined stable futures and towards engaging with the uneven, fragile conditions that already define everyday digital life. I also encourage the design community to look up, or look down, behind something, or right in front of them to attend to the ways that computing and its infrastructures become entangled in our lives.



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REFERENCES

[1] Sara Ahmed. 2019. *What's the use?: On the uses of use*. Duke University Press.

[2] Nikhil Anand. 2017. *Hydraulic city: Water and the infrastructures of citizenship in Mumbai*. Duke University Press.

[3] Bailey Basham. 2021. The South's communication infrastructure can't withstand climate change. *Southerly*. Retrieved May 17, 2021 from https://southerlymag.org/2021/01/08/the-souths-communication-infrastructure-cant-withstand-climate-change/

[4] Arne Berger. 2025. Show Me Your More-Than-Human. In *Proceedings of the 2025 ACM Designing Interactive Systems Conference*, 2025. 148–159.

[5] Heidi R. Biggs, Jeffrey Bardzell, and Shaowen Bardzell. 2021. Watching myself watching birds: Abjection, ecological thinking, and posthuman design. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 2021. 1–16.

[6] Virginia Braun and Victoria Clarke. 2006. Using thematic analysis in psychology. *Qualitative research in psychology* 3, 2 (2006), 77–101.

[7] Patrick Brodie. 2023. Data infrastructure studies on an unequal planet. *Big Data & Society* 10, 1 (January 2023). https://doi.org/10.1177/20539517231182402

[8] Ingrid Burrington. 2016. *Networks of New York: An illustrated field guide to urban internet infrastructure*. Melville House.

[9] Ashley Carse. 2014. *Beyond the big ditch: Politics, ecology, and infrastructure at the Panama Canal*. MIT Press.

[10] Kate Crawford. 2021. *The atlas of AI: Power, politics, and the planetary costs of artificial intelligence*. Yale University Press

[11] Daniel Cusick. Global Internet Connectivity Is at Risk from Climate Disasters. *Scientific American*. Retrieved January 13, 2026 from https://www.scientificamerican.com/article/global-internet-connectivity-is-at-risk-from-climate-disasters/.

[12] Ramakrishnan Durairajan, Carol Barford, and Paul Barford. 2018. Lights out: Climate change risk to internet infrastructure. In *Proceedings of the Applied Networking Research Workshop*, 2018. 9–15.

[13] Steve Graham and Simon Marvin. 2002. *Splintering urbanism: networked infrastructures, technological mobilities and the urban condition*. Routledge..

[14] Mél Hogan. 2015. Data flows and water woes: The utah data center. *Big Data & Society* 2, 2 (2015)

[15] Steven J. Jackson. 2014. 11 rethinking repair. *Media technologies: Essays on communication, materiality, and society* (2014), 221–39.

[16] J Nathan Jessee. 2021. Tribal leaders raise 'serious concerns' about plans to turn their shrinking Louisiana island home into a 'sportsman's paradise' | NationofChange. Retrieved April 8, 2026 from https://www.nationofchange.org/2021/07/26/tribal-leaders-raise-serious-concerns-about-plans-to-turn-their-shrinking-louisiana-island-home-into-a-sportsmans-paradise/

[17] Martin Kaste. 2025. Live cameras are tracking faces in New Orleans. Who should control them? *NPR*. Retrieved April 8, 2026 from https://www.npr.org/2025/12/16/nx-s1-5616681/new-orleans-live-facial-recognition-surveillance

[18] Sebastián Lehuedé. 2025. An elemental ethics for artificial intelligence: water as resistance within AI's value chain. *AI & SOCIETY* 40, 3 (2025), 1761–1774.

[19] Jen Liu. 2022. Hanging on a Wire: Understanding the Impacts of Climate Change on Networked Infrastructures in South Louisiana. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts*, April 27, 2022. ACM, New Orleans LA USA, 1–5. https://doi.org/10.1145/3491101.3503817.

[20] Jen Liu, Daragh Byrne, and Laura Devendorf. 2018. Design for Collaborative Survival: An Inquiry into Human-Fungi Relationships. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (*CHI '18*), 2018. Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3173574.3173614

[21] Jen Liu, Cindy Kaiying Lin, Anne Pasek, Robert Soden, Lace Padilla, Daniela Rosner, and Steven Jackson. 2022. Towards a Material Ethics of Computing: Addressing the Uneven Environmental Stakes of Digital Infrastructures. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts*, April 27, 2022. ACM, New Orleans LA USA, 1–5. https://doi.org/10.1145/3491101.3505649.

[22] Szu-Yu (Cyn) Liu, Shaowen Bardzell, and Jeffrey Bardzell. 2019. Symbiotic Encounters: HCI and Sustainable Agriculture. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, May 02, 2019. ACM, Glasgow Scotland Uk, 1–13. https://doi.org/10.1145/3290605.3300547.

[23] Szu-Yu Liu, Jen Liu, Kristin Dew, Patrycja Zdziarska, Maya Livio, and Shaowen Bardzell.

2019. Exploring noticing as method in design research. In *Companion Publication of the 2019 on Designing Interactive Systems Conference 2019 Companion*, 2019. 377–380.

[24] Alex Jiahong Lu, Shruti Sannon, Cameron Moy, Savana Brewer, Jaye Green, Kisha N. Jackson, Daivon Reeder, Camaria Wafer, Mark S. Ackerman, and Tawanna R. Dillahunt. 2023. Shifting from Surveillance-as-Safety to Safety-through-Noticing: A Photovoice Study with Eastside Detroit Residents. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, April 19, 2023. ACM, Hamburg Germany, 1–19. https://doi.org/10.1145/3544548.3581474.

[25] Shannon Mattern. 2013. Infrastructural tourism. *Places Journal* (2013).

[26] Claudia Núñez-Pacheco and Anton Poikolainen Rosén. 2024. Articulating felt senses for more-than-human design: A viewpoint for noticing. In *Proceedings of the 2024 ACM Designing Interactive Systems Conference*, 2024. 1029–1043.

[27] Lisa Parks. 2007. Around the antenna tree: The politics of infrastructural visibility. In *ACM SIGGRAPH 2007 art gallery*. 345.

[28] Lisa Parks. 2015. "Stuff You Can Kick': Toward a Theory of Media Infrastructures. In *Between Humanities and the Digital*. 355–373.

[29] Donny Persaud. 2025. Extra-Terrestrial Broadband: Negotiating the Seams of Starlink Satellite Internet Infrastructure. In *Proceedings of the ACM SIGCAS/SIGCHI Conference on Computing and Sustainable Societies*, 2025. 214–227.

[30] Robert Soden, Laura Devendorf, Richmond Wong, Yoko Akama, and Ann Light. 2022. Modes of Uncertainty in HCI. *Foundations and Trends® in Human–Computer Interaction* 15, 4 (2022), 317–426.

[31] Susan Leigh Star. 1999. The ethnography of infrastructure. *American behavioral scientist* 43, 3 (1999), 377–391.

[32] Nicole Starosielski. 2015. *The undersea network*. Duke University Press.

[33] Anna Lowenhaupt Tsing. 2015. *The mushroom at the end of the world: on the possibility of life in capitalist ruins*. Princeton University Press, Princeton.

[34] Brit Ross Winthereik, James Maguire, and Laura Watts. 2019. The energy walk: Infrastructuring the imagination. In *digitalSTS: A field guide for science & technology studies*. Princeton University Press, 221–239.

[35] Clyde Woods. 2017. *Development drowned and reborn: The blues and bourbon restorations in post-Katrina New Orleans*. University of Georgia Press.