

Invisible Labor and Regimes of Accumulation: Platform Labor and Amazon Mechanical

Turk

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Platform labor is a digital, capitalist infrastructure that leverages and exploits digitally performed human labor to increase profit margins. Within a platform labor model such as Amazon Mechanical Turk (MTurk), power asymmetries are essential to render human workers invisible and devalue their skills. Workers are become invisible through the use of Application Programming Interfaces (APIs) and algorithmic management functions. Human workflow is managed by algorithmic functions, and the product of human computational labor is collected through APIs; the use of digital technology as an intermediary between the human and her work renders her invisible through the elimination of human-to-human interaction.

In this paper, I will explore the relationship between platform labor and invisible work, specifically within the context of MTurk and propose research to legitimize digital labor and transform invisible work into visible work. First, I will present the essential functions and characteristics of MTurk. Next, I will review existing literature to provide an overview of invisible work, present models of invisible work in platform labor models, and describe how human workers are rendered invisible specifically within MTurk. Finally, I will propose methods to explore invisible labor and the phenomenon of heteromation through the theoretical lens of political economy, coupled with data activist methods within critical informatics theory. I will propose these theoretical approaches to address the gaps in literature and present unanswered questions to address for future research.

Platform labor offers the underemployed, unemployed, and unemployable opportunities such as flexible work schedules and an absence of hierarchical reporting structures. However, the affordances of platform labor come at the expense of autonomy, fair wages, health benefits, and

other rights of the human. MTurk is an example of a platform labor model. The premise of the MTurk model requires two communities: the requester (firms: large corporations and organizations) and the worker (typically, under employed or unemployed human workers.) A requester will seek workers to perform Human Intelligence Tasks (HITs) in exchange for minimal pay. HITs typically consist of cognitive work that requires minimal subject matter expertise, such as image classification or labeling large datasets. The essential motivation for a requester to use MTurk is to codify incredibly large datasets in a short period of time by many workers in order to supplement the functionality of algorithms and computers.

Jeff Bezos launched Amazon Mechanical Turk (MTurk) in 2005. This digital labor platform served as a solution to mitigate the legal labor requirements associated with the need for hiring large swaths of humans to perform short-term digital tasks, such as image labeling, product page duplications, and data cleansing. While there are certain types of digital tasks that can be automated and performed by a computer, some tasks require human intelligence to decipher cultural meanings and identify nuances in images. Bezos described this need for human intelligence to support computational intelligence as “artificial artificial intelligence” (Martin et al, 2014).

In earlier versions of the MTurk website, the FAQ page provided an explanation for the meaning of the name: Amazon Mechanical Turk (see Figure 1.) The Mechanical Turk was a chess-playing automaton created by Wolfgang von Kempelen in the late 1700s. It was toured around Europe to meet opponents who would dare to attempt to defeat the automaton. The Mechanical Turk was undefeated and left its opponents in a state of wonder—just *how* was this automaton designed and so capable of replicating human intelligence? The answer was a secret

panel below the chessboard where von Kempelen's assistant operated the mechanical arms, completely invisible to the human opponent (see Figure 2.)

Bezos borrowed the concept of the Mechanical Turk to create the modern day illusion of fully automated computer systems by utilizing invisible human intelligence to render these systems functional. Still, the concept of invisible human intelligence is not the only purpose of MTurk. It is a robust infrastructure designed to reduce costs and drive profits through a pay-what-you-want model by leveraging the skills of workers, on demand. The MTurk website still promotes this value model today (see Figure 3.) In summary, MTurk was specifically created to conceal the use of human intelligence to power the functionality of computational systems, while devaluing the human labor in order to save costs and drive profits.

Literature review

overview of invisible work

Invisible work is often used to describe work that is not part of the traditional economic system and not recognized as employment worthy of remuneration. Leonard (1998) notes that the work of women is prototypical of invisible work. The author summarizes that women perform duties that are essential to domestic work, raising children, and emotional labor. These are not formal domains of work that participate in the economic system and are not compensated—they are types of invisible work.

Star et al (1999) provide an overview of invisible work in order to define visible and invisible labor in order to better inform the design of networked systems that interact with or define organizational or communication process that directly impact systems of labor. The authors present examples of invisible labor specific to a case study of domestic house workers, in

order to exemplify the nuances of visible and invisible labor. While domestic work is visible, there are aspects of this work that are invisible, such as emotional work and childcare.

Additionally, Star et al note that there is a fine line between visible and invisible work is an extreme use of surveillance. In other words, through the process of legitimizing work, constant surveillance can be a consequence—legitimization comes at the sacrifice of a sense of human freedom and autonomy. This traditional sense of invisible work serves as the foundation for recognizing modern forms within the digital sphere, specifically platform labor.

Suri et al (2019) present a case study through an ethnographic approach to reveal the actual experiences of digital platform labor workers. The authors contend that artificial intelligence, robots, and automated labor are not in the foreseeable future for all types of tasks and work. There are, instead, many nuanced types of work that require the power of human interpretation to complete them. As such, the hidden world of digital platform labor is filled with human workers who perform menial tasks for severely low wages. The authors identify many examples of *ghost work* or invisible labor that often requires the workers to perform duties that are either unpaid or underpaid. In the case of MTurk, Suri et al identify that, while the actual work performed are underpaid, the workers also perform work outside of the platform. They create websites and groups dedicated to sharing knowledge, worker to worker, in an effort to navigate the process of platform labor that is often tied to high risks (laboring hours spent) with low reward (low pay or non-payment.) Suri et al demonstrate how the platform labor system functions and the layers of invisible labor workers undertake in order to leverage the highest possible yield.

models of invisible work

Invisible labor is an observable typology within many domains, but there are shared characteristics across all domains. Hatton (2017) creates a model to represent the different mechanisms of invisible work and organizes them into three categories: sociocultural (learning the local language or culture of an office or a community), sociolegal (sex work, graduate student work, prison work), and sociospatial (no shared or formalized geographical workspace). The author notes that the functions of each mechanism render the worker invisible uniquely, but uniformly devalues the work. Additionally, Hatton notes that each of these mechanisms can interact with each other depending on the circumstances. For example, remote, digital work that is conducted within the sociospatial mechanism is further compounded by sociolegal circumstances, because the workers are legally classified as casual workers and are not protected under traditional labor laws. Consequently, the work is devalued, specifically “*because of their exclusion from legal definitions of employment*” (Hatton, p. 342). Invisible work is always devalued.

Howcroft et al (2019) present a typology of crowdwork platforms in order to establish connections between each instance of platform labor and to identify patterns of power and information asymmetries across all digital platform labor models. The authors identify four types of crowdwork platforms: online task crowdwork (paid task work subject to satisfaction of requester), “playbour” crowdwork (Howcroft et al, 2019) (unpaid or conditionally paid work fused with creativity and pleasure as a means of motivation productivity), asset-based services (localized service work such as delivery or ride-hailing work), and profession-based freelance crowdwork (similar to high-skilled freelance work such as programming and designing digital apps or supplying photography for iStockphoto.) The common themes that are shared across

each of the four crowdwork platforms include: algorithmic control and coordination, blatant avoidance of traditional worker classification to circumvent labor regulations to reduce labor costs, and a massive collection of geographically dispersed digital workers that impedes the ability to organize and take action to demand fair wages and benefits (Howcroft et al, 2019). The authors highlight the connections and power asymmetries across all crowdworking platforms to indicate a shared narrative. The methods of control and power that are infused into the infrastructures of crowdworking platforms are a means to extract value through the circumvention of labor laws and the exploitation of digital workers (Howcroft et al, 2019). Howcroft et al advocate for digital laborers to unite to find political strategies to force regulations to guarantee fair wages and benefits.

invisible labor and amazon mechanical turk

Bergvall-Kåreborn et al (2014) provide an overview of the structure of MTurk and how it creates a borderless workspace. The requesting firm can reside anywhere in the U.S., and the worker can work from any location. A borderless workspace creates a system of unspecified workers, who are invisible to traditional labor policy and legislation (Bergvall-Kåreborn et al, 2014). The authors also review the basic stipulations of the MTurk agreement, which is referred to as the participation agreement. Some of the stipulations of the agreement include: worker cancellation at any time, conditional payment predicated upon the satisfaction of the requester, no benefits, and to state that Amazon is free of all liability between the relationship of the requesters and the workers (Bergvall-Kåreborn et al, 2014). Bergvall-Kåreborn et al further highlight the invisibility of the workers, noting that MTurk assigns each worker an alphanumeric ID identifier. Finally, the authors note the power asymmetries that are part and parcel of the

MTurk infrastructure: requesters can sort and filter the workers, but the workers cannot view or filter any information about the requesters to make informed decisions when accepting a HIT. When the workers choose to accept a HIT and complete it within the timeframe as specified, the requesters are under no obligation to pay for the work completed—the requester awards payment that is depending on satisfaction. The power asymmetries exerted within MTurk are core to extracting value.

Irani (2015a) succinctly notes that MTurk was created to solve the problem of frequently requiring temporary labor to execute tasks that computers cannot perform accurately. This is typically described as *just in time* labor. Irani specifically states that, “MTurk was born out of the failures of artificial intelligence to meet the needs of Internet companies seeking to expand the domain of the data they could store, classify, and serve up online. Artificial intelligence, it turned out, failed to classify the cultural nuances of images, sounds, and texts that filled web 2.0” (Irani, p. 225). Irani also discusses the differentiation of workers between a tasker and an innovator. The programmers elevate themselves to a more elite status by outsourcing the menial tasks through MTurk. This differentiation is not only an explication of power, it is also a means for attributing value: “[w]ithin the Internet industries, those who can outsource tedium and lower-value work can instead enjoy highly valued work and the promise of the creative, collaborative new-media work-place (Turner 2009)” (Irani, p. 229). Finally, Irani notes that there is value in utilizing an invisible work force. When large swaths of human labor are hidden from companies, the myth of artificial intelligence work is perpetuated and increases value in the company. Irani notes, “[b]y hiding the labor and rendering it manageable through computing code, human computation platforms have generated an industry of startups claiming to be the future of data. Hiding the labor is key to how these start-ups are valued by investors, and thus key to the speculative but

real winnings of entrepreneurs” (Irani, p. 231). When investors or venture capitalists invest in start-up companies, it is frequently based on a false premise of the capabilities of the technology that is being invested in, because invisible human workers are actually powering the functional aspects of the technology.

Ellmer (2015) analyzes the embedded hierarchical power structures of MTurk through the theoretical approach of Social Construction of Technology (SCOT). The author identifies instances of power and information asymmetries that are core to the design of the MTurk infrastructure and its modus operandi. The information asymmetries render the worker invisible through the systemic processes of deskilling tasks, devaluing the labor, and the use of one-way communication and rating tools (requester to worker). The author identifies these qualities as digital divisions of labor and modern instances of Taylorism.

Martin et al (2014) present their ethnomethodological analysis of worker posts in MTurk worker forums and blog sites. The authors uncover many nuances about the reality of MTurk worker life, such as: seeking community help for advice on requester quality; providing feedback on how to design better HIT requests for the requesters; air grievances about a variety of frustrations, etc. Martin et al recognize the instances of power and information asymmetries within these forums and conclude that interventions must take place to balance the power. The authors discover through their interviews that workers fear outsider meddling to aid in attaining equality or fairness within MTurk because it could risk shutting the platform down completely—the workers want to be able to have the freedom to pick and choose digital work, regardless of unpredictable, low wages. The authors cited Irani’s *Turkopticon* as an exemplary measure for providing participatory assistance in balancing power.

Irani et al (2013) developed a Firefox and Chrome plug-in extension for workers to rate and review AMT requesters. The authors designed this tool as a means to balance the panoptic surveillance structure that is part of the design of the AMT infrastructure to benefit the needs of the requester. Within the MTurk platform, the requester has the ability to select and filter workers based on their ratings and associated skills in order to choose or prevent specific workers to complete their HIT. This design feature establishes a power asymmetry. However, workers desire the ability to know more about the requester: do they design HITs that are clear and concise? Do they pay in a timely manner? Do they refuse payment without justification? Do they assign unrealistic work timelines to complete the HIT?

The MTurk system does not offer a means to communicate this to the worker to make informed decisions. Turkopticon serves as a technological means to bridge that gap. The basic premise of the Turkopticon plug-in is that it can collect specific requester identification information from the HIT request page, log it, and then retrieve a rating score based on previous worker reviews. Irani et al partnered with real workers to capture the needs and compile a “Workers’ Bill of Rights” (Irani et al, 2013). Each worker can submit a review after they complete a HIT for a requester. The review fields include: communicativity, generosity, fairness, promptness, and a free-form text box to write specific details of their experience (Irani et al, 2013). The authors note that the reviews include truncated worker identification emails in order to preserve some sense of anonymity while simultaneously allowing for limited visibility of the reviewer to establish credibility. Turkopticon draws from data and systems activist methods in order to provide an intervention for the workers in the AMT ecosystem to reclaim power (Irani et al, 2013). The authors note, however, that while Turkopticon has offered a reliable means of

intervention, it has not forced design changes by MTurk to systemically formalize a balance of power.

Methods

In this section, I will provide an overview of the theoretical models that will inform the direction of my research. I will outline my proposal for future research in the following section. First, I will review the core concepts of labor and production through the theoretical lens of political economy. Next, I will present Ekbia et al's concept of heteromation, which the authors describe as modern logic of accumulation. The phenomenon of heteromation is observable within the ecosystem of MTurk, creating an infrastructure of controlling production through power asymmetries to accumulate value. Finally, I will introduce data activist methodologies within critical informatics to guide future research for dismantling power asymmetries within the modern capitalist labor process.

Labor process theory analyzes how firms or managers organize the work force to control the methods and pace of production to accumulate the largest profits possible. Marx (1990) defines surplus value as the difference between the raw material cost, total labor time, the amount of labor and the actualized profits that remain after the sale of the commodity that is produced. In order to extract surplus value, it is integral to control the modes and process of production—the conditions of labor are integral to creating value (Marx, 1990). Ekbia et al (2015) articulate the phenomenon of heteromation as the mode of accumulating value within the scope of Marx's labor process theory.

Heteromation as a phenomenological conceptualization of the labor process theory offers an analysis of how value can be accumulated for the immaterial productions of digital labor. Ekbia et al define heteromation as “technical systems that function through the actions of heterogeneous actors, with automation, a paradigm oriented to the actions of machines” (Ekbia et al, p. 2). The authors identify that the essential difference between crowdsourcing and heteromation is through an analysis of who benefits from the value that is created through the interaction of humans and computers. In the example of crowdsourcing, an entire community will pool efforts to perform microtasks and the value of this work benefits all—consider tagging images with subject metadata to make the images searchable and retrievable for all. Heteromation, on the other hand, will require microtasks to be performed by humans, but the benefit serves a select few—consider requesters posting HITs for MTurk workers to execute; the labor is cheap, and it saves the requester time and money. Furthermore, heteromation requires that the human is invisible in order to devalue the worker—the invisibility of the human is what creates surplus value. Ekbia et al also define heteromation as requiring hidden labor, creating value for the corporation:

Heteromation extracts economic value from *uncompensated* or *low-wage labor*, inciting participation through an intricate set of mechanisms comprised of social and emotional rewards, monetary compensation, and coercion. Generating this value doesn’t cost capital much, yet it summons intelligent human labor from the masses across global networks of billions of nodes (Ekbia et al, p. 25).

In short, firms rely on platform workers to accomplish tasks that would ordinarily be completed by full time employees. Full time employees have associated wages that contribute to the expense line, and not grow the profit line; invisible workers have a lower contribution to the expense line.

Spencer (2018) asserts that the uses of technology, such as platform labor systems, are not neutral modes of managing the labor process. Rather, technology is the means of controlling production to accumulate value in capitalism. According to Spencer, “Marx highlighted the degradation of work and workers caused by technology. Workers were not liberated by technology; rather, they were enslaved by it” (Spencer, p. 2). The notion of technological enslavement is most recognizable through the process of invisibility in platform labor systems. Algorithmic management and one-way communication mechanisms are designed to suppress autonomy, create imbalanced power structures, and further hide the worker. Spencer acknowledges the need to democratize platform labor systems to “ensure that technology is harnessed for humane goals” (Spencer, p. 10). Critical informatics theory and data activism methods offer models to democratize technological infrastructures.

Currie et al (2018) present the guidelines for implementing critical data methods in any marginalized community. The authors assert that utilizing critical data theory aids in revealing inconsistencies of datasets and alternative narratives. When critical analysis methods are accessible to wider selections of communities, there can be greater participation in democracy and potential for holding powerful institutions accountable. According to Currie et al, the criteria to conduct activist data archiving are as follows:

Activist data archives persist independent of traditional institutional contexts; these non-expert publics conduct statistical work considered of high enough quality to make legitimate claims; and this work often takes shape using decentralized platforms and governance structures (Currie et al., p. 68).

The purpose and motivating force of activist archives is to disrupt the control of traditional, institutional archives in order to diffuse the perpetuation of marginalization.

Currie et al note that the participation of both the insider (lay publics) and the outsider (technology experts) are essential to the characteristics of an activist archive. This partnership can result in the development of open-source digital tools to facilitate the collection, access, and application of metadata to challenge the validity of the institutionalized datasets and demonstrate the possibility of alternate perspectives and knowledge. The authors note, “while data holds immense power when applied from the top-down, ...there are ways that this power can be wielded from the bottom up” (Currie et al., p. 76). Platform labor systems are constructed by the firms in order to increase profits by diverging from traditional labor systems; critical data studies and activist data methods can be leveraged to dismantle these systems from the bottom up.

Future directions

In this paper, I have presented an overview of invisible labor, the models, and the methods to render a human worker invisible within the landscape of MTurk. The existing literature provides a comprehensive understanding of how invisible labor is created systemically, but there is not enough literature that explores how digital workers can be made visible. In order to explore how invisible work can be made visible I have three questions to pursue for future research. First, in the case of MTurk, payment for services performed are conditional, what historical parallels exist? In this case, I want to create a genealogy of work that was paid under the condition of approval in order to draw parallels to the conditional nature of paid services within platform labor systems and how legal protections were enacted over time. Second, what is the current state of legal engagement that has been examined to change labor policy to account for digital labor? Specifically, I believe it would be valuable to collect all city and state regulations for digital labor to leverage successes that could inform approaches to effect change

for national labor policies. Finally, what digital tools can be created, through a partnership with digital workers, to aid in quantifying the hours worked, the wages earned, the wages withheld, and the community training designed or performed? How can data activist methods materialize and legitimize the work digital laborers produce, in order to obtain the legal rights to livable wages, benefits, and flexible schedules?

Conclusion

In this paper I have presented MTurk as an example of platform labor and the exploitative infrastructure that renders human workers invisible in order to circumvent labor laws that guarantee minimum wages and benefits to reduce costs and increase profits. While the current literature today provides a sufficient overview of how human workers become invisible, there is not enough research to explore how to make them visible and obtain equal labor rights. In an effort to address this gap, I have proposed a phenomenological exploration of heteromation through the theoretical lens of political economy to address the power asymmetries with data activist methods within critical informatics theory. My aim of this proposal is to contribute research to effect policy change to protect the rights of human digital workers.

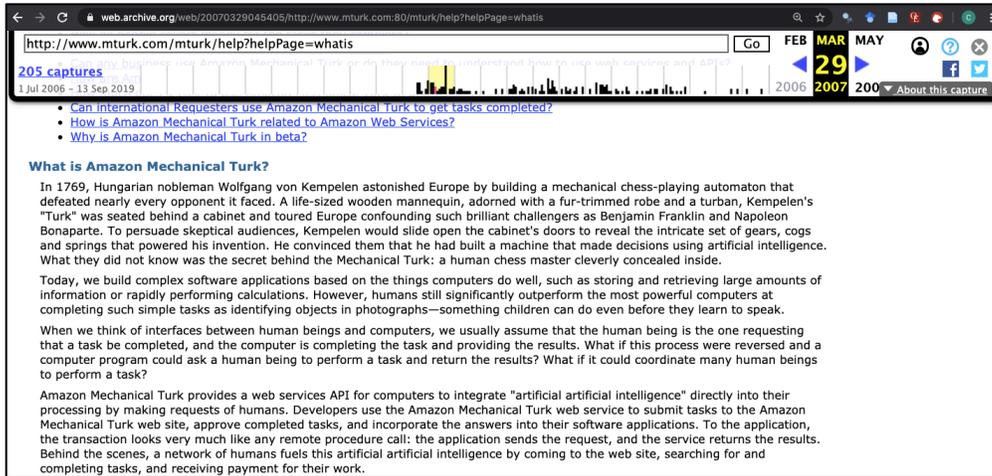


Figure 1. Amazon Mechanical Turk Name FAQ (Retrieved from the Internet Archive’s Wayback Machine)

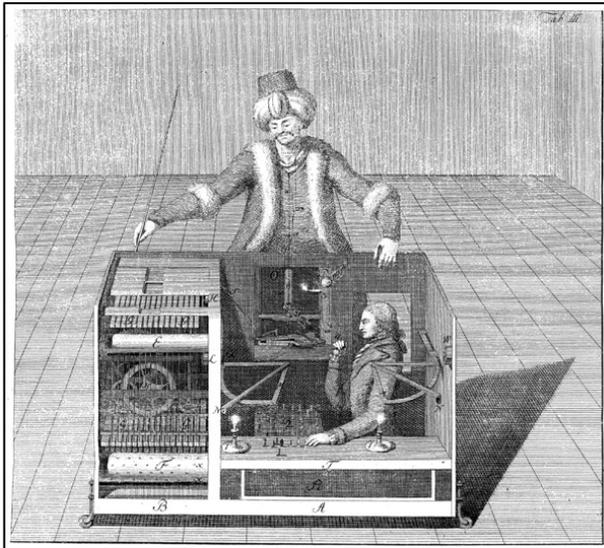


Figure 2. The Turkish Chess Player (Retrieved from Wikimedia Commons)

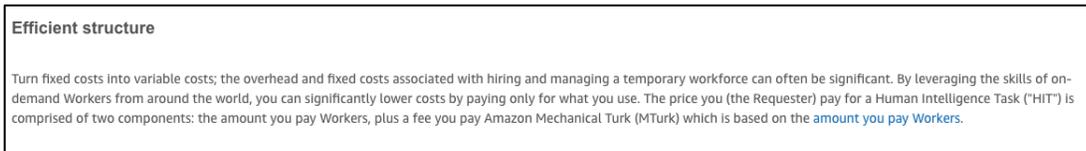


Figure 3. MTurk Efficient Structure (Retrieved from MTurk.com)

References

- Amazon Mechanical Turk (2007, March 29): faq what is mechanical turk. Retrieved December 13, 2019, from <https://web.archive.org/web/20060718103720/http://www.MTurk.com/MTurk/help?helpPage=whatis>.
- Aytes, A. (2012). Return of the crowds. In *Digital Labor: The Internet As Playground and Factory*. New York, NY: Routledge.
- Bergvall - Kåreborn, B., & Howcroft, D. (2014). Amazon mechanical turk and the commodification of labour. *New Technology, Work and Employment*, 29(3), 213–223. <https://doi.org/10.1111/ntwe.12038>
- boyd, danah, & Crawford, K. (2012). Critical questions for big data: Provocations for a cultural, technological, and scholarly phenomenon. *Information, Communication & Society*, 15(5), 662–679. <https://doi.org/10.1080/1369118X.2012.678878>
- Currie, M., Donovan, J., & Paris, B. (2018). Preserving for a more just future: tactics of activist data archiving. In U. M. Munshi & N. Verma (Eds.), *Data Science Landscape: Towards Research Standards and Protocols* (pp. 67–78). https://doi.org/10.1007/978-981-10-7515-5_5
- De Stefano, V. (2015). The rise of the just-in-time workforce: On-demand work, crowdwork, and labor protection in the gig-economy. *Comparative Labor Law & Policy Journal*, 37(3), 471–504.
- Ekbia, H., & Nardi, B. (2014). Heteromation and its (dis)contents: The invisible division of labor between humans and machines. *First Monday*, 19(6). <https://doi.org/10.5210/fm.v19i6.5331>
- Ekbia, H., & Nardi, B. (2017). Heteromation, and other stories of computing and capitalism. Cambridge, MA: The MIT Press.

- Ekbia, H. R., & Nardi, B. (2015). On the margins of the machine: Heteromation and robotics. *iConference, Newport Beach, CA, IDEALS, '15*.
- Ellmer, M. (2015). The digital division of labor: Socially constructed design patterns of amazon mechanical turk and the governing of human computation labor. *Momentum Quarterly* 4(3), 174-186.
- Hatton, E. (2017). Mechanisms of invisibility: Rethinking the concept of invisible work. *Work, Employment and Society*, 31(2), 336–351. <https://doi.org/10.1177/0950017016674894>
- Howcroft, D., & Bergvall-Kåreborn, B. (2019). A typology of crowdwork platforms. *Work, Employment and Society*, 33(1), 21–38. <https://doi.org/10.1177/0950017018760136>
- Irani, L. (2015a). Difference and dependence among digital workers: The case of amazon mechanical turk. *South Atlantic Quarterly*, 114(1), 225–234. <https://doi.org/10.1215/00382876-2831665>
- Irani, L. (2015b). The cultural work of microwork. *New Media & Society*, 17(5), 720–739. <https://doi.org/10.1177/1461444813511926>
- Irani, L. C., & Silberman, M. S. (2013). Turkopticon: Interrupting worker invisibility in amazon mechanical turk. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems - CHI '13*, 611. <https://doi.org/10.1145/2470654.2470742>
- Leonard, M. (1998). Invisible work, invisible workers: the informal economy in europe and the us. New York: St. Martin's Press.
- Martin, D., Hanrahan, B. V., O'Neill, J., & Gupta, N. (2014). Being a turker. *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing*, 224–235. <https://doi.org/10.1145/2531602.2531663>
- Marx, K., Engels, F., Mandel, E., & Fowkes, B. (1990). Capital: A critique of political economy. London: Penguin in association with New Left Review.

- Nardi, B., & Ekbria, H. (2018). The future of human labor: A look at manufacturing and war. *ACM SIGCAS Computers and Society*, 47(4), 46–53. <https://doi.org/10.1145/3243141.3243148>
- Spencer, D. A. (2018). Fear and hope in an age of mass automation: debating the future of work. *New Technology, Work and Employment*, 33(1), 1–12. <https://doi.org/10.1111/ntwe.12105>
- Star, S. L., & Strauss, A. (1999). Layers of silence, arenas of voice: The ecology of visible and invisible work. *Computer Supported Cooperative Work (CSCW)*, 8(1), 9–30. <https://doi.org/10.1023/A:1008651105359>
- Suri, S., Gray, M. L. (2019). Ghost work: How to stop silicon valley from building a new global underclass. New York, NY: HMH Books.
- Sweeney, M. E., & Brock, A. (2014). Critical informatics: new methods and practices. *Proceedings of the American Society for Information Science and Technology*, 51(1), 1–8. <https://doi.org/10.1002/meet.2014.14505101032>
- Thompson, P. (2010). The capitalist labour process: Concepts and connections. *Capital & Class*, 34(1), 7–14. <https://doi.org/10.1177/0309816809353475>