

# From Critical Design to Critical Infrastructure: Lessons from Turkopticon

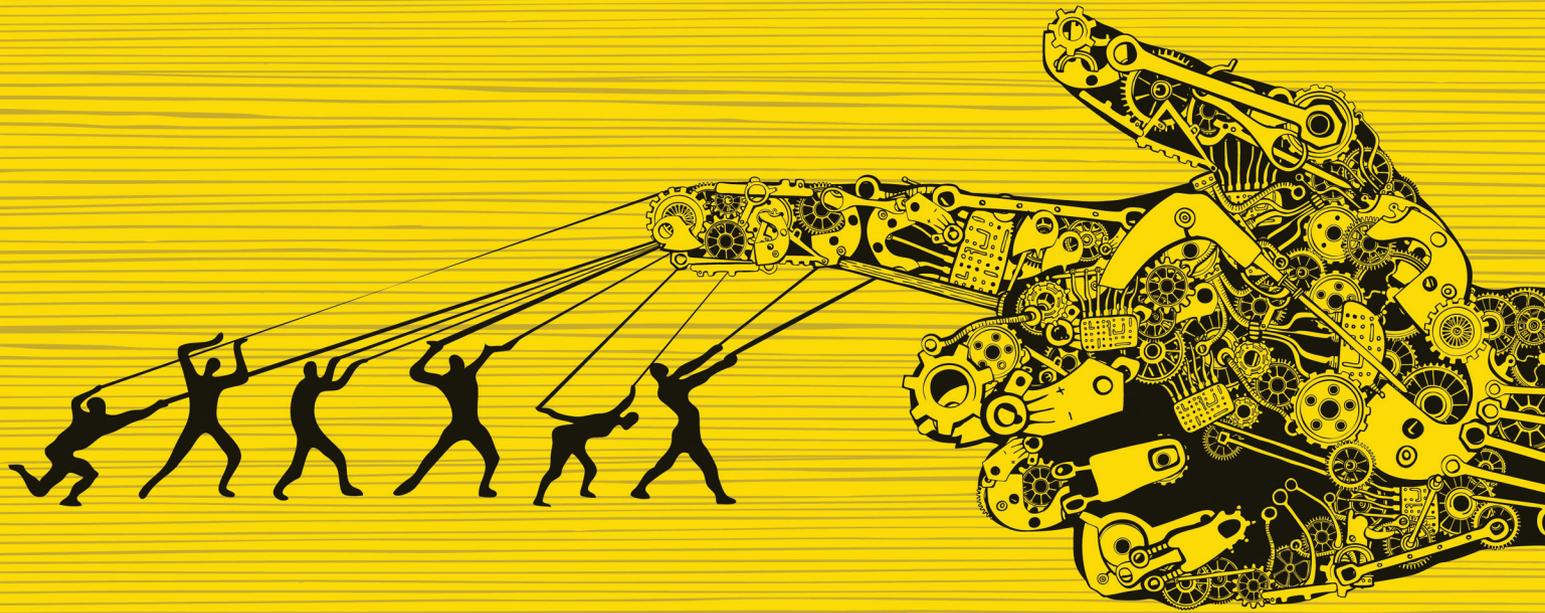
## Insights

- Designing with users produces not only technology, but also social solidarities, alliances, and shared imagination—the latter may ultimately matter more.
- A culture that favors fast innovation—hackathons and quick prototypes—risks devaluing the slow work of creating critical infrastructure.

Amazon Mechanical Turk (AMT) works by keeping worlds apart. AMT is a Web-based labor market that draws workers from all over the world to perform small bits of digital labor for pay—frequently for as low as a few dollars an hour. Amazon’s engineers and managers designed AMT to make up for the failure of artificial intelligence to fully automate their data-processing tasks. Unable to replace low-status workers with machines, Amazon simulated machines with hidden, globally distributed, contingent, low-status workers. From outside, the technologists and researchers who work “through” AMT see it as a smoothly functioning

infrastructure. AMT organizes workers for the pleasure of programmers and the productivity of companies and researchers [1]. “Requesters” (Amazon’s legal term for employers) write code to delegate information work to this “crowd,” which is figured and organized as technological rather than human infrastructure—as “artificial artificial intelligence,” in AMT’s cheeky but truthful tagline.

We were concerned about the ethical implications of crowdsourcing and have engaged those questions through design, building, and systems maintenance. News stories and papers on crowdsourcing often oscillate



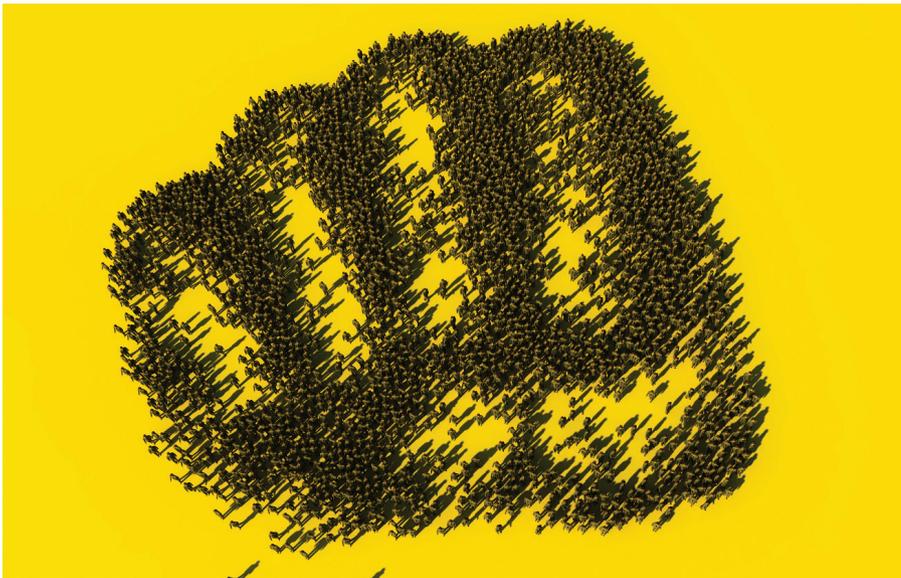
between jubilant speculation and “sweatshop” exposés, while those invested in the long-term future of crowdsourcing try to formulate agendas for meaningful, pleasant, and even just futures of work. We entered the debate critical but open-minded—we were not “Turkers,” but we were computing workers more broadly concerned about the futures of work being built in our field and industry. Following philosopher Donna Haraway, we chose to stay with the trouble. We began with designs on crowd-powered computing but have stayed engaged over the past six years, becoming part of the Turker ecology through maintenance, repair,

and the communicative work of keeping Turkopticon going.

Turkopticon came out of engagements with Turkers in 2008, when we asked them—through Mechanical Turk itself—to articulate a hypothetical Bill of Rights. Rather than a rigorous survey, the elicitation invited workers to imagine what “better” crowdwork might mean. Responses to the survey were diverse and sometimes conflicting. But eight themes recurred: uncertainty about payment, unaccountable and seemingly arbitrary rejections (i.e., non-payment), fraudulent tasks, prohibitive time limits, long pay delays, uncommunicative

requesters and administrators, costs of employer errors borne by workers, and frequently low pay. Over the years, Turkers have grounded our understandings of microwork’s benefits and drawbacks. For example, AMT brings stopgap, short-term jobs to those with limited employment options because of geography, mobility limitations, or economic conditions. Yet many workers still find themselves working in a system with limited recourse when faced with wage theft or disciplining by requesters or Amazon.

In response to our interactions with Turkers, we designed and built



Turkopticon, a Web application and browser add-on that augments the AMT interface with reviews written by Turkers. Turkopticon, alongside crucial worker communities such as Turker Nation, mTurk Forum, CloudMeBaby, mTurk Grind, and the mturk and HITsWorthTurkingFor “subreddits” on reddit.com, helps bridge the worlds of workers and employers—and, occasionally, journalists, researchers, and organizers. Among the several thriving communities through which workers engage in mutual aid, Turkopticon’s structured review format allows it to specialize in calling employers to account. Unfavorable reviews on Turkopticon have prompted more than a few employers to wonder why their tasks are not being completed—and, eventually, to engage with workers through Turkopticon and other online venues.

We have maintained Turkopticon for five years. It has become a staple worker tool, with more than 28,000 registered users, 110,000 reviews of 24,000 employers, and 400,000 visits per month. It is an often-taken-for-granted part of the livelihood strategies of workers who use their

Turking income to meet basic needs. At the time of this writing, Turkopticon has hosted reviews on the vast majority of employers in the system. In short, it is part of the “ecology of infrastructure” around AMT [2]. In a practical sense, Turkopticon has succeeded in attracting a growing base of users that sustain it as a platform for an information-sharing community. The system—and the questions we raise with it—has attracted coverage in *The Nation*, *O’Reilly Radar*, *The Sacramento Bee*, *AlterNet*, *East Bay Express*, and *Communications of the ACM*, among other venues. This coverage has gathered over the years. Rather than making a big splash, Turkopticon has been a thorn in the side of crowd-labor celebrants and a critical invitation for ethical scientists and engineers to imagine and implement ethical crowd relations.

Turkopticon was never meant to be a solution to the problems of crowdsourcing. Amazon Mechanical Turk is massive, and the economic forces driving crowdsourcing are too large for any silver bullet. Crowdsourcing is definitely one case where design can’t solve the problem.

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What design can do about these complex issues is to shift the debate by changing the interfaces, maintaining refusal, and articulating the critique. People also do this with Twitter, spray paint, and electoral campaigns. Design is one among these interventions in political life, rather than a replacement for them. Turkopticon’s approach has been closest to what Carl DiSalvo calls adversarial design—a design practice of generating agonistic political encounters. Rather than searching for consensus, agonistic political theorists argue that democracy must allow for strong adversaries in a process of “forever looping contestation” [3]. Within fields of crowdsourcing and public technology, we have maintained Turkopticon’s cheeky and agonistic tone while also keeping it alive as an infrastructure for mutual aid among workers. We situate that reminder in the everyday practices of workers (see [4]). Because workers find Turkopticon practical, Turkopticon lives on online as an ongoing invitation to debate microwork. Practicality means that Turkopticon becomes lively in use by workers, and with it, questions of labor fairness remain live and in circulation. Practicality has also meant that we, as designers, have become ordinary parts of Turking life through maintenance, repair, and ongoing communication with Turkopticon’s users.

## REPAIR, MAINTENANCE, AND BECOMING CRITICAL INFRASTRUCTURE

Keeping Turkopticon lively has stretched us beyond our preparation as *designers*. Design suggests transformational action, but primarily through acts of planning and specification; repair and maintenance fall out of view in most design discourse [5]. In public culture, designers are credited with form, novelty, and the production of new options for society—Jony Ive, Rem Koolhaas, and Doug Engelbart are not Apple Store repair workers, building maintenance staff, or the localization teams that translate interfaces so global audiences can use them. Over the past five years, however, we’ve moved from the moment of Turkopticon’s design to the less glamorous and more labor intensive processes of repair, maintenance, and communication with users. Turkopticon’s current form cannot

be explained by design alone. Repair work—both ongoing and in crises—sustains the system and informs our design decisions as Turkopticon evolves.

To keep Turkopticon going, for example, we adapt to evolving work practices and worker expectations. When the system was small, occasional rants and profanity slid by easily. As the reviews piled up, aggressive language began to drive some workers away. In response, we added an automated profanity filter. We also designed flagging and moderation features and invited some of our most prolific reviewers—Tainturk, Honuagal, and Anne M—to moderate problematic reviews.

Through repair, we also keep Turkopticon moving on the treadmill of computational change. More than once we've spent unplanned days recovering from our host's "upgrades" to our server. In summer 2013, Firefox changed its security requirements for browser add-ons; we scrambled to comply. For years, the growth of our user base stressed our host's servers. They throttled our CPU usage, slowing down Turkopticon for workers. As an infrastructure, Turkopticon hums along quietly on some days but lurches and drags on others.

We take repair seriously by keeping our technical ambitions small even as our social change ambitions are large. We keep the design of the tool minimal—not because minimal is beautiful, but because we can maintain minimal on a small budget. The futures of repair constitute our imagination of what we would want to design.

This repair and maintenance work, as Steven Jackson argues persuasively [5], falls out of view when we focus on design as production, origination, and innovation. Jackson writes that dominant imaginings of technology locate and valorize innovation "at the top of some change or process, while repair lies somewhere else: lower, later, or after innovation in process and worth." Yet "the efficacy of innovation in the world is limited—until extended, sustained, and completed in repair." Following Jackson's "broken world thinking," we can't claim here that as designers we are the agents of progress. Rather, we find ourselves within the "fractal, centrifugal, always-almost-

falling-apart world" as agents of always inadequate "fixing and reinvention, reconfiguring and reassembling into new combinations and new possibilities."

This reassembly produces not only technology, but also new social formations that emerge through these practices of design. Repair work strengthens ties and builds solidarity among workers collaborating on the practical, shared, and political circumstances we share in addressing issues of fairness in crowdwork. For example, we spent years answering user questions over email. About a year ago, we switched to an email list where people with a stake in Turkopticon—users, moderators, maintainers, fans—can pose and respond to questions. Sometimes, these discussions are around technical issues or bugs. Other times, they might be a debate about how much employers really ought to pay. Those discussions can at once be down in the details of use and a mile high about how Turkopticon's categories are creaking under the weight of Turking life. The email list is not customer support or a bug list, where requests are tracked and questions resolved. The list is where we build social ties and a communicative exchange around Turkopticon's bugs, repairs, strengths, and futures. Building solidarities is one way of countering HCI's tendency, as Dourish has argued [6], to take market framings for granted; users are not customers to be persuaded or empowered through consumption. Communication and maintenance involve more than bugs to be fixed or feedback to be contained and managed. It can be a site for generating collectivities and shared understandings around objects of common concern—the design intervention. We call on HCI researchers to see technology design's potential for sustaining new polities that can become powerful foundations for social change. Designing and sustaining these technologies are not just ways of making technological things. Keeping Turkopticon going has also generated a web of relationships of common cause, out of which other kinds of solidarities might emerge. Those relationships will remain, at least for a while, even if Turkopticon, the technology, one day ceases to exist.

## ACKNOWLEDGMENTS

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## ENDNOTES

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## ADDITIONAL RESOURCES

- ▣ Irani, L. and Silberman, M.S. Turkopticon: Interrupting worker invisibility in Amazon Mechanical Turk. *Proc. CHI 2013*. 611–620.
- ▣ Martin, D., Hanrahan, B.V., O'Neill, J., and Gupta, N. Being a Turker. *Proc. CSCW 2014*. 224–235.
- 📄 DoTips for Requesters on Mechanical Turk (a worker-run advice blog); <http://turkrequesters.blogspot.com/>

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