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#3 *Unstable Infrastructures*

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Media infrastructures – like many sociotechnical systems – sit uncomfortably at the intersection of abstract claims about human rights to internet access and more concrete examples of *infrastructuring*.[1] These abstractions and their distance from specific implementations mirror the nature of computational systems themselves.[2] A feminist approach to infrastructuring as *critical technoscientific practice* that emphasizes concerns about social justice remediates this distance by integrating aspirations and ideals with actions.[3] This iterative reintegration of reflection and thinking with activities of building, making and doing contributes to the creation of a kind of cyborg, a hybrid practice that bridges the dichotomy between mind and body.[4] These divisions have structured much of (Western) society, our institutions and the ways in which we respond to humanitarian crises.

The building and maintenance of wireless networks as humanitarian interventions reveal the localized, situated and embodied nature of media infrastructures, making it difficult to ignore the lived realities of migrants and refugees living in emergency shelters and reception centers. By this I mean that in a very visible and material way, the

1 Cp. Erling Björgvinsson, Pelle Ehn, and Per-Anders Hillgren, "Participatory Design and 'Democratizing Innovation'", paper presented at the Proceedings of the 11th Biennial Participatory Design Conference, 2010, pp. 41–50.

2 Cp. Ed Finn, *What Algorithms Want: Imagination in the Age of Computing*, Cambridge, MA, MIT Press, 2017.

3 Cp. Philip Agre, "Toward a Critical Technical Practice: Lessons Learned in Trying to Reform Ai", in: Geoffrey C. Bowker, Susan Leigh Star, William Turner, and Les Gasser (eds.), *Bridging the Great Divide: Social Science, Technical Systems, and Cooperative Work,* Mahwah, NJ, Erlbaum, 1997, pp. 131–57.

4 Cp. Donna Jeanne Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century", in: Donna Jeanne Haraway, *Simians, Cyborgs and Women: The Reinvention of Nature*, New York, Routledge, 1991, pp. 149–81.

building of wireless networks requires a kind of physical intimacy between the volunteers and those they seek to benefit. This is because the work of building wireless networks requires a number of resources such as antennas, routers, cables, plugs and power sources, all of which must be located in fairly close proximity – generally, a few hundred feet – to the area that is to be covered.

Here, there is an obvious tension between the geographic constraints placed on these communities and the, often, utopian and revolutionary discourses around the imaginaries, mythologies and promises of technology, which makes this case particularly interesting.[5] Based on earlier studies of locally managed and controlled community wireless networks, the potential freedoms include the possibility of avoiding government surveillance, choosing open source rather than proprietary protocols and supporting volunteer networks rather than relying on Internet Service Providers (ISPs) to name just a few.[6]

Since the early 2000's, community wireless networks around the world have been aware that in building technical networks, they are also engaged in experimenting with alternative social, political and economic forms. The sociotechnical nature of these media infrastructures is evident in a 2007 statement by Juergen Neumann, one of the founders of Freifunk, saying that the organization was "social initiative but also as a physical infrastructure."[7] Yet, at the same time, community wireless networks are embedded in some of the same hacking communities that have been criticized for their problematic relationship with gender, race, class, sexuality, ability etc.[8]

In this case, awareness of these lived realities of migrants and refugees can take place without deliberate strategies to listen to and work collaboratively with oppressed groups towards meaningful definitions of problems and relevant solutions. The physical control of migrants as well as the desire to limit their digital mobility may make it difficult to use more collaborative, participatory design approaches to building networks in these contexts.[9] Approaches rooted in feminism and design justice provide some ways of considering and navigating the

5 Cp. Paul Dourish and Genevieve Bell, *Divining a Digital Future: Mess and Mythology in Ubiquitous Computing*, Cambridge, MA, MIT Press, 2011.

6 Cp. Laura Forlano and Alison Powell, "From the Digital Divide to Digital Excellence: Global Best Practices for Municipal and Community Wireless Networks", Washington, D.C., New America Foundation, 2011.

7 Laura Forlano, "When Code Meets Place: Collaboration and Innovation at Wifi Hotspots", Columbia University, 2008.

8 Cp. Christina Dunbar-Hester, "Beyond 'Dudecore'? Challenging Gendered and 'Raced' Technologies through Media Activism", *Journal of Broadcasting & Electronic Media*, 54 (1), 2010, pp. 121–35.

9 Cp. Elizabeth B.-N. Sanders, and Pieter Jan Stappers, "Co-Creation and the New Landscapes of Design", *CoDesign,* 4 (1), 2008, pp. 5–18.

complexity of political and ethical decisions that necessarily animate the work of infrastructuring in the context of the building of sociotechnical systems.

According to SSL Nagbot (a pseudonym for the editors of a special issue on Feminism and (Un)hacking), "Feminist hacking/making is therefore not simply a matter of inquiry of abstract ideas and theories but combines intellectual inquiry with ethical enactment and sociotechnical praxis. Feminist hacking/making includes not only teaching underrepresented groups how to do technical things like coding and soldering, but also includes the complex sociocultural work of bringing technological experts into dialogue with non-technological others."[10] This ability to navigate and build relations that transgress epistemological boundaries around technological expertise is particularly significant because it opens the possibility for alternative flows of knowledge. A feminist approach to hacking and making does not cling to naive ideas about meritocracy. Rather, it acknowledges the structural inequalities that make participation possible for some, and impossible for others.

Design, including the design of sociotechnical systems and infrastructures, can be used both to challenge oppression and injustice as well as to generate more equitable alternative possible futures, and "alternative nows".[11] According to the Design Justice Network, "We use design to dismantle structures that exploit nature and the human experience through systems of domination [...]. Simultaneously, we use design to sustain, heal, and empower communities as we birth a sustainable future."[12] Their "10 Ways Designers Can Support Social Justice" provides a set of guidelines that are useful for the consideration of critical technoscientific practices. They write:

1. Define a set of principles by which you will work.
2. Distance yourself from those who work against your principles.
3. Rethink representation.
4. Consider your negative impact.
5. Get involved and build on work that is already happening.
6. Humble yourself. Design with, not for.
7. Learn about privilege and anti-oppression.
8. Know when not to design.
9. Shape alternative futures.

10 Lilly Nguyen, Sophie Toupin, and Shaowen Bardzell, "Feminist Hacking/Making: Exploring New Gender Horizons of Possibility", *Journal of Peer Production*, 8, 2016.

11 Johan Redström, *Making Design Theory*, Cambridge, MA, MIT Press, 2017.

12 Sasha Costanza-Chock (ed.), *Design Justice in Action*, 3, Design Justice, Design Justice Network, 2017.

10. Begin by listening.

As a living document, the Design Justice Network invites participation and contribution to the continued evolution of these 10 principles. In the case of wireless networks, as well as many other sociotechnical systems, considerations around maintenance, repair and care are central to their sustainability. In particular, I draw on Ames and Rosner's "negotiated endurance", which "refers to the process by which different actors – including consumers, community organizers, and others – drive the ongoing use, maintenance, and repair of a given technology through the sociocultural and socioeconomic infrastructures they inhabit and produce. In this framework, breakdown and repair are not simply planned or avoided through design, but instead actively produced and reconfigured through use."[13] In this way, it is possible to reimagine the transformation of passive users into more active participants in the functioning of the network, which requires a deeper commitment to listening, learning and the infrastructuring of social relations. These reconfigured social relations – a radical reconsideration of who has claims to and how to assess the value of territories, expertise and resources – can form the basis of emergent social structures that move beyond existing forms of inequality and oppression.

13 Daniela K. Rosner and Morgan Ames, "Designing for Repair?: Infrastructures and Materialities of Breakdown", paper presented at the Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing, 2014.