

Humane Infrastructures Conversations #1

Inside and Outside: Shifting Socio-Technological Systems

Conversationalists:

[Marie Louise Juul Søndergaard](#), Oslo School of Architecture and Design (MLJ)

[Matt Ratto](#), University of Toronto (MR)

Commentators/interventionist/s:

[Nicole Anand](#), Parsons School of Design The New School, The Residency (NA), UNDP (NA)

[Sara Hendren](#), Olin College (SH)

[Sha Xin Wei](#), Arizona State University (SXW)

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Curator: Patrik Svensson

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Curatorial introduction

The starting point for this conversation was the accumulative work of feminist designer/researcher Marie Louise Juul and critical making scholar Matt Ratto as well as individual encounters I had with them over the span of two weeks (without having the conversation in mind) where they each brought up specific projects they were working on.

I was fascinated with how they brought together critical and constructive engagement in working with others in what I thought was a uniquely nuanced, reflexive and insightful way. These were not stories about immediate success, but about attempting to interrogate and shift complex socio-technological systems in multi-stakeholder situations. Juul and Ratto were positioned inside the projects while simultaneously looking at the process from the outside.

The conversation was supposed to be textual, asynchronous and slow (a kind of anti-zoom format). It was not staged as an interview, but as a flowing and curated conversation where participants were encouraged to personal as well academic and professional. The situation could perhaps be compared to a conversation in a room with two or more people simply talking without props (no slides, presentations, notes) and with an active moderator/curator present.

There was of course also a potential, distributed audience.

As regards the format, participants were instructed that contributions did not have to be polished or fully edited. Furthermore, the advantage of maintaining relative sequentiality was stressed. The format was also said to be experimental - new things could emerge in the process. The curator's job was described as making sure the conversation did not get too all over the place and that there was a trajectory.

Invited commentators/interventionists provided another important element. These were mostly invited during the conversation as it shaped up and no specifics were given until later in the process. The commentators were invited to the latter part of the conversation. They were given the opportunity to read through what had been said and then engage in conversation with the main discussants, making comments, making suggestions, and providing interventions. We were lucky to have three highly competent and generous commentators.

Nicole Anand is a political economist who does work on governance and systems change (Parsons, UMDP etc.). Sara Hendren, an artist, designer and disability studies researcher, explores how the built world can be built differently in relation to human capacity, worth, and interdependence. Sha Xin Wei, artist, scholar and transdisciplinary practitioner, is an expert on gestural media and, more generally, topological approaches to poiesis, play and process.

Conversation

PSV: Thank you for agreeing to participate in this conversation! It means a lot to me. One reason I am really looking forward to engaging with both of you is that I think there are overlaps as well as differences in your work and that you both really do the work that I and others talk about. The direct impulse for asking you to participate in this conversation was that one or two weeks apart, I met with both of you in different contexts, and was struck with how you talked about specific projects with people from other areas or domains, where it was not only obvious that you had both thought a lot about the conditions and challenges for doing work across epistemic traditions (broadly speaking in relation to socio-technological systems), but also that you were actually doing it - and learning from it. In a sense you were also both inside and outside - part of the projects, but looking at them from the outside - caring about the process (critically, practically, about the dynamics etc.) as well as the project and the work.

Note about order: Regardless of the order indicated below (e.g. MR and MLJ), if the other person has responded before you, feel free to relate to those comments (if that is something you want to do) as well as the question.

PSV: But first it would be great if you could introduce yourselves and your work (one or two paragraphs each please, not the long CV or bio style, but what led to where you are and what you are doing now, what is your driving force/s).

MLJ: Thank you Patrik, for inviting me to take part in this conversation! I started my work back in 2015, when I applied for a PhD position at Aarhus University in the Digital Design department,

which is actually part of a humanities program with a tradition also in electronic literature and digital art, but also neighboring the computer science department with its long tradition of participatory design and democratic development of information technologies. I wanted to pursue a research career to have the freedom of exploring questions and challenges that I wasn't always able to during my education, because of either institutional, disciplinary or societal stigma and barriers. I was particularly interested in doing work around menstrual and sexual technologies, and designing for such taboo and sensitive topics from a critical and political perspective. A lot of new technologies designed for women as consumers and users -- within the broader term "FemTech" -- started to emerge, and I was both curious and troubled by how they gendered and capitalized on intimate bodily experiences of women. I engaged deeply in feminist technoscience, gender theory, and critical theory, to try to make sense of both my own lived and situated experience, as well as the social and political narratives and power structures that these technologies produced and upheld. My own design practice, which is inspired by critical and speculative design practices, including Matt Ratto's critical making, as well as participatory design, has been a driving force for me to question power structures, including sexism, in technology development. While I consider myself a designer, I navigate within and between spaces of design, digital art/software studies, and HCI (Human-Computer-Interaction).

Since I received my PhD degree in 2018, I have been a postdoctoral researcher in Interaction Design, within a research group exploring Digital Women's Health, particularly within an HCI discipline. Here I have been leading a research project in collaboration with a Stockholm-based high school on designing menstrual technologies with adolescents; a wish to explore tech development as menstrual advocacy with(in) the communities which my research is aiming to serve. For two years, I have both been diving deeper into the HCI discipline, while also establishing collaborations with computer scientists, engineers, and material scientists, to trouble my own understanding of what design and critique can do in the relation between humanities and STEM fields. However, when going deeper, I've also at times lost touch of more experimental, artistic and reflective approaches to design and technologies, and with a wish to constantly move, challenge, or queer, disciplinary boundaries, I've taken up a researcher position at the Oslo School of Architecture and Design, where I will continue my research on designing menstrual and sexual health technologies, particularly looking into working with marginalized communities and exploring issues related to social and environmental sustainability.

MR: Well, as you know Patrik, while I began my career doing ethnomethodological studies of emerging digital technologies, in around 2007 I started thinking about the material-semiotic nature of the socio-technical systems I was studying and feeling concerned about how to really come to terms with their materiality. I was rereading the feminist science studies scholars like Haraway, Harding, and Barad, but also more materialist thinkers from Anthropology like Jane Bennett and Tim Ingold. Basically, I was engaging broadly in what people at the time were calling the 'materialist turn' but I wasn't entirely happy with how the material was addressed pragmatically within social science and humanities scholarship. In that great year I spent at Humlab at Umea (!!!) in 2007, I started seeking a methodological starting place for digging in

differently to these systems and came up with a rather simplistic idea of somehow using actual technical work as a correlate to critical scholarship. There wasn't anything really fancy or novel about this. Basically, I used processes of critical analysis and deconstruction to highlight important contradictions within socio-technical systems, built systems prototypes that attempted to temporarily close down or re-open those contradictions, and then used these processes to deepen my conceptual understanding of similar systems in the world. This was often a very laboratory focused and auto-ethnographic/hermeneutic style of scholarship and while it did not lend itself to the kinds of 'proof' and epistemic practices within engineering or even really the social sciences, it seemed to operate OK within more humanities-style academic communities. I called it critical making in order to try and sideline epistemic and ontological attachments to fields like engineering, design, or art, though in retrospect that was pretty naive.

PSV: Could you also talk briefly about your current headspace and "take"? Again, doesn't have to be long.

MLJ: Yes, absolutely! As said, I just started a new position with lots of freedom and a prompt for me to challenge design discipline. This is a great opportunity for me to reconsider both my own values and hopes within my research and reflect on where I see the wider design/art/technology discipline going. Currently, I am extremely interested in the materiality of our bodies-in-environment, including designing with bodily fluids and organic matter (e.g. menstrual blood, urine, and bacteria), as well as the materiality of technologies, including machine learning/AI and biobased and biodegradable design materials. Design as a discipline is (finally) exploding and we start seeing more diverse accounts of what design could be, including previously oppressed making-practices, world-views, and bodies. Countering what science is, what material is, what body/mind, nature/culture is, I'm currently researching witchcraft, machine learning, and biomaterials. With the covid-19 pandemic, I have sought a closer connection with nature, sought away from urban areas and screens, and found peace and resilience in practices of care and rituals of making in the home and my immediate environment. My "take" on the post-pandemic design field is that "materiality" will keep having an importance, and that designers will increasingly question what brings meaning and value to their communities. In my practice, this includes troubling the tension between speculation and materiality, and the human body and more-than-human concerns.

MR: After a number of years doing the kind of bespoke critical making projects I described above, I started to feel a little concerned. Specifically this had to do with a kind of 'firewall' I had put up between the outcomes of critical making and the broader world. I had felt that some sort of intellectual barrier was necessary to prevent the critical and conceptual processes within my scholarly practice from being too easily perturbed by more pragmatic objectives associated with instrumental values from engineering or aesthetic, didactic values from art and design. I had wanted to keep the critical making processes focused on the development of self-insight and not get into the game of solving problems or making others 'see the light.' I had felt and still feel there was a need for a kind of critical technical engagement that, like other forms of critical scholarship, primarily focused on 'seeing things differently'. I was in fact most concerned about getting caught in the game of exhibition and display where artists and designers produce things

Commented [Sara Hend1]: this is such a beautifully succinct way of describing your work, Matt, and the work of so many others!

Commented [Matt Ratt2]: thanks Sara! Yes, I have realized that my main goal has been to try and distill down what is essential to processes of material engagement that are intended to support reflexive, critical 'openings'. Not focusing on virtuosic performances, aesthetic outcomes, or problem-solving, but on the commitments, habits, and practices that help us think in novel and liberatory ways about socio-technical systems. Nothing wrong with aesthetics and problem-solving, but I have found that too tight a focus on those outcomes really makes it hard to come up with emergent rather than reactive possibilities.

Commented [Sara Hend3]: Agree! And so much packed into this affirmation.

Commented [Sha Xin W4]: indeed! can we elaborate the "and"

intended to have some sort of impact on others. Sort of funny - whereas there is lots of attention paid to the issues associated with engineering 'solutionism' there is much less concern about how didactic objectives can also be a way of short-changing deeper critical and reflexive practice. I was helped in thinking about this through my conversations and observations of the design school at Umea - I saw how these design students were not just being trained in technical and artistic processes of creativity, they were also being taught, often implicitly, to develop patterns and techniques which helped them maintain a kind of openness to possibility long after others might start closing down potential directions in order to attend to external others. This seemed to me to be one of the most important parts of a training in art and design practice and the most difficult thing to master. Rather than take that on, I decided to try and route around the problem by keeping the focus on my critical making on research outcomes rather than direct external impacts. In fact, in the first few critical making sessions, I told the participants that we would destroy the results at the end of the event!

At any rate, I have for the last few years been rethinking this decision. I realized that separating critical making practices from the world ended up losing a major aspect of material insight, namely, the frictions that are created when systems enter into and participate in broader social formations. Since about 2016, I have been working on breaking that self-imposed barrier and have been developing critical making projects that start from the deep dives described above but result in outward facing work. The main example of that is my work with Nia Technologies on 3Dprinted prosthetics. Of course, the major downside to this kind of work is that it does not follow academic timelines and often involves commitments that do not always fit well into the scholarly world.

PSV: Thank you very much! This is great - rich, personal, reflective. And generous. And there are interesting overlaps and differences between your stories. It seems to me that you come more directly from a design/making perspective, Marie Louise, critically informed, and with a strong will to change "the world", to what is perhaps a more systemic approach as you seek to change the design discipline. Matt, you come from an STS-like perspective (although you built things early on) via a carefully constructed critical making practice/process without tangible, designed "products" to engaging more with the friction when systems come into the world and producing material products/systems (more of a full circle perhaps).

PSV: First, I would like to give you the opportunity to comment/pose questions regarding the other person's responses above (and feel free to be direct). It would be great if you could do one question/comment each (and any follow-up discussion) If there is an extended discussion with several iterations it can happen in this space (expanding below, in this section before the next set of questions).

MLJ: I am super curious to hear more about the decision to move your critical making project "closer" to the world, and your reflections around this move. The frictions as you mention, as arising from the social formations of a project/system/object coming into contact with the world rather than existing in a vacuum, are so interesting. As I understand it, there is both a temporal aspect: what happens through time when these outcomes of critical making are allowed to live

Commented [Sha Xin W5]: very interesting -- but this could be complemented with political economy: who is supported to do this kind of inquiry, in what institutional structures, and how is this supported / authorized (or not) politically & economically?

Commented [Matt Ratt6]: absolutely - lots of critiques regarding the political economy of art - and novel attempts to address the issues with the institutional structures and the ways they police who can participate.

Commented [Sha Xin W7]: closer to pure performance! It was said that Royal Deluxe theater company used to burn their giant puppets at the end of a run. see also Bread and Puppet Theater <https://www.nytimes.com/2007/08/05/theater/05cott.html>

Commented [Matt Ratt8]: I think based in part on my early acting experiences and understanding of theorist practitioners like Artaud.

Commented [Sha Xin W9]: We explicitly adapted some insights from the practices that Jerzy Grotowski and Peter Brooks developed over many years and many actors, directors and ensembles to quite a different stratum of work in research creation: experimental experience / experiential experiment via experimental technologies.

Commented [Sha Xin W10]: There's a subtle question of 3Dprinting's popularity in academic discourse as a symptom of the academic habit of subsuming matter into logos. In manufacturing there are already many many processes for forming matter: stamping, rolling, casting, injection molding, https://en.wikipedia.org/wiki/Injection_moulding, weaving, etc. etc. etc. 3Dprinting (accenting printing!) opens the door for screen and page-oriented thinkers to lay claim to "making". (Vera Bühlmann and Ludgar Hovestadt made this explicit in a sophisticated way in their Metalithikum symposia.)

Commented [Matt Ratt11]: definitely! A strong attraction to 3Dprinting for many people is the way in which it appears to provide the capacity to make materials things, without all the hubbub of actually having to engage materially! Of course what these people soon realize (once they begin designing and printing) is that digital fabrication is of course a deeply material phenomenon, with only some claims towards complete abstraction!

Commented [Sha Xin W12]: 3D-printing, as its very name announces, ferociously implements what Barad memorably observed: "Language has been granted too much power. The linguistic turn, the semiotic turn, the interpretative turn, the cultural turn: it seems that at every turn lately every 'thing' — even materiality — is turned into a matter of language or some other form of cultural representation. The ubiquitous puns on "matter" do not, alas, mark a rethinking of the key concepts (materiality and signification) and the

... [1]

and be lived with (by humans or other non-human agents that are interacting with it); and one related to the participants/actors/stakeholders in the project: who is invited to do the making? Who is it for? And which values arise when it is not only critical scholars involved in the critical making. Could you say a bit more about this? I myself am curious in doing critical work that is outward facing, also with industrial stakeholders, so I am intrigued about your motivation and experience with this move.

MR: Great questions! I guess I sort of backed into addressing both kinds of frictions that you mention, both the direct engagement with stakeholders outside the university and the results of this work 'living' in the world and directly influencing the lives and actions of people. My first sense that critical making was limited in this capacity came during a project that involved 3D printing a handgun.

I was asked to take part in a current events tv program here in Canada on the 3D printing of guns. Cody Wilson, then a law student who had released a working gun model on the Internet was appearing. His main argument at the time was that 3D printed guns made gun control regulation obsolete. The show wanted an alternative voice to speak on this topic. In order to prepare, students in my lab and I printed and assembled a gun and did some research on gun control, the 2nd Amendment in the US Bill of Rights, and the history of DIY and home-built guns. I felt prepared to speak on the topic and to show the gun we have printed as an example. It was by the way a deeply aesthetic object - printed in a combo of clear and opaque materials, really highlighting the way in which it had been produced but also super ominous, like a foreign, dangerous object from the future (see image below.) But on the show, when Cody was asked why he had developed and released the liberator gun 3D models, he responded "I guess its a critical form of making" and went on to describe his goal of political change and the role of materializing the gun as part of that process. Smart guy, to turn my own critical apparatus against me! (And reminiscent of how STS scholars bemoaned how their epistemic relativism was turned against them by climate change deniers and right-wing political advocates more recently.) My response was relatively weak: I talked about the difficulty we had in making the gun, how much simpler it was to purchase an illegal gun or build one using stuff bought from home depot, and critiqued Cody's claim that 3D printing guns was easy.



I've written about this in a couple of places, but most notably in a chapter called "not just guns

but bullets too" where I try to describe a difference between 'deconstructive' and 'constructive' making. Deconstructive making is when the goal is to use material practices to deconstruct and denaturalize the connections between particular technical things and social and political attributes. Constructive making occurs when one resutures together the social and the political in a novel and hopefully liberatory way. My sense is that deconstructive making is only the first step in creating real change. And its clear that one needs to be 'in the world', engaging with stakeholders, users, people, systems, infrastructures, institutions, in order to actually do 'constructive making.' Of course, the problem with that is that the timelines and outcomes are not necessarily inline with the expectations associated with academic institutions.

The prosthetics project that I have been working on since 2014 is an example of this - and was the direct result of the limitations I described above. I don't want to get too much into the history of this project, but basically we were asked to work with funders in Canada and clinics in LMIC contexts to develop a digital toolchain to support rehabilitation clinics. After initial pilot studies and ethnographic work with a clinic in Uganda, we began to build a scanning, design, and printing hardware and software solution that accelerated the provision of lower-limb prostheses. But the 3D technologies we were working with had a 'naturalized' way of working that was in conflict with the expertise of the prosthetists and orthopaedic technicians who were collaborating with us. We had been sensitized to these kinds of issues through past critical scholars' explorations of automation and labour - Marx, Braverman, more recently, Star, Suchman, and ethnographies of digitalization and work. But because we had learned a lot about 3D printing and design, we were able to re envision the technologies and the system we were building to reposition the laborer as an expert while still maintaining the potential cost and time benefits that automation provided. Key here was combo of tech knowledge, social knowledge, direct engagement with stakeholders and users and - and this is I think most important - a commitment to enacting change. THis last part is, I think, the most important and difficult. It requires attending to the contexts in question but also being willing to be complicit in the systems we are studying and want to transform. I like Donna Haraway's way of saying this 'staying with the trouble', and the practice Joe Dumit describes as part of this. He notes, leveraging Deleuze, the need to stay attentive to the violence that one does, that one is complicit in, to not look away. I think that is the hard part of critical, constructive making - that we have to engage in trade-offs, lose any sense of our own purity, and be directly complicit. The title of the piece on 3D guns I mentioned before is my sense of taking this to extremes, if I really wanted to combat Cody Wilson's reimagining of gun control, then maybe I needed to not just make guns, but also make their bullets...

MR: Marie-Louise, I'd love to get more details on how you conceptualize the trajectory of your work into the context of 'femtech' as you describe above. You note that you were initially troubled by the commodification of women's bodily experiences that you saw occurring in the development and marketing of these technologies. What kinds of impacts does/do you want your work to have, and what do you see as the most productive processes/channels through which your work and related insights would reach relevant stakeholders? Do you see the impacts of your work as deconstructive and didactic or as posing alternative models to those circulating and potentially naturalized around femtech and women's health, some combo or

Commented [Sha Xin W13]: what about individual and collective intentions, norms, value frameworks, relations of power / affect / desire , etc.? Drawing the boundary of the discussion too tightly around the (fabrication of) material objects may make it difficult to adequately address Cody's provocation.

After all, the making of, or in Foucault's terms, the genealogy of, the insane engages a much richer universe than the physical fabrication of manacles or ships.

Commented [Matt Ratt14]: I think the power of Cody's provocation (and many that come from a technocentric point of view) is that all that idea stuff (intentions, values, norms, relations of power, and genealogies) are made opaque and become naturalized within the material thing. In other words, the act of making the 3D printed gun buried the need for gun regulation, disappeared it, because of the new capacities for distribution and the apparent lack of current systems to provide governance - at least that is what Cody wanted us to believe. But while this is of course not true (as your reference to Foucault highlights) what I found is that material objects have powers that deconstructive modes do not.

Commented [Sha Xin W15]: We already have innumerable species of experts. Given that in the face of any wicked messy complex situation every expert is inadequate,

Also, is the whole notion of divide and conquer part of the problem?

Commented [Matt Ratt16]: For me, the main thing was that a group of care givers (prosthetists) were being mis-recognized as non-expert and that we could potentially address this in our design.

other move?

MLJ: That is a great question, and one that I ask myself often. I see my work and research both speaking within and critiquing the wider femtech industry, and I try to both suggest alternatives and point to the wrongs of how femtech conceptualises women, bodies, and health. I believe critique doesn't go far, if even I can't show alternatives. The current models around femtech (or female technologies) are building on narratives of "designed by women, for women", which in a historical context of technologies that have been designed by men, for men, might appear radical. But actually most femtech products are reproducing dominant values of technology -- centralised power, datafication, personalisation, disembodiment -- through acts of solutionism where health issues are framed as problems to be solved by technology. And as products on a market, often developed in the US, femtech often follows economic models of health rooted in neoliberalism, where health is an individual problem. But when they are marketed and sold globally, they enter into existing health care systems and services which vary greatly around the world, causing great friction between health care practitioners and people who use these technologies. On top of that, many of these products often reproduce the stigma around women's bodies, and further alienate people from their own bodies, as technologies and black-box algorithms start developing knowledge about their bodies which could, or perhaps should, reside in themselves rather than beyond a glossy screen.

As I see it, these femtech products are missing an opportunity to radically change what and how health is experienced, including challenging dominant norms and stigma around health and bodies, and also the dominant values that are embedded in technology. Here, [the work I have been doing the last years](#), together with collaborators such as Nadia Campo Woytuk, Karey Helms, Madeline Balaam and Marianela Cioffi Felice, turns to new materialism and feminist technoscience for inspiration from Donna Haraway, Karen Barad, Jane Bennett, and Sara Ahmed. We have been conceptualising, imagining and building technologies that intimately touch our bodies, inviting people to care for and notice changes in their bodies, and literally get messy and construct new knowledges with the materiality of one's body, incl. bodily fluids and movements (Søndergaard et al., 2021; Campo Woutyk et al., 2020, Helms et al. 201). And not only on an individual scale, but really focusing on how knowledge is collectively produced and also shaped for instance in schools, workplaces, at the doctor's office, or even how the body's materiality in influencing or influenced by more-than-human scales, such as an environmental pollution and bodily waste, and in this sense also broadening up the question of what is designed, from the idea of designing products, to designing practices or rituals of care.

I see the impact working on multiple temporal scales, one is the impact I have within and through the academic community which shapes a lot of technology development for the future. And another scale is through the communications and possible collaborations with industry partners in current products, incl. technology companies, and health services, or even educational institutions and organisations such as high schools and sports clubs, which I have also collaborated with. While I appreciate the work that critical and speculative design projects to, as also an intellectual exercise in imagining otherwise, I see the biggest impact when my work comes directly into contact with scientific, industrial and community partners, and works

Commented [Sha Xin W17]: key!

Commented [Sha Xin W18]: Can you please supply links to documentation of this?

Commented [Marie Lou19]: Yes, thank you for reminding me about that

with both the friction and common beliefs that we may hold.

PSV: A question for you, Matt: Am I right to assume that you in your work have moved from a radical epistemological position to a more socially and politically engaged position (not that one replaces the other)? In any case, it would be great if you could speak to this question.

MR: As you note, one doesn't replace the other. Instead, the move I described above really represents an attempt to better situate radical epistemological work (as you put it) as an important and often overlooked and undervalued moment within socially and politically engaged technoscience. I've come to realize that what I call critical making is one specific moment within the trajectory of critical technoscience projects, the moment when the material-semiotics of the system in question are re-opened to alternative materialities and processes of meaning-making. STS and feminist materialist scholars have provided so many useful tools for doing this work - highlighting the artificiality of the monsters we call gender, the body, nature, technology (Haraway), sensitizing us to the ways claims of purity are part of the political repertoire of naturalizing the built environment (Latour), and revealing the machinery whereby apparently stable and ahistorical objects are made to appear so (Law, Barad.)

I actually think many of the tools are already implicitly deployed by designers and engineers in their creative and critical practices but that we can a) do a better job in making visible this often veiled work; b) training designers and engineers to actually be able to do it; c) modeling the creative and critical value; and d) developing explicit processes for translating critical work into input into critical making moments and then translating the results of those moments into deployable outcomes. I guess I am still an epistemological plumber but now I am working on somewhat different clogs.

PSV: And a question for you, Marie Louise: Can you speak about strategies for (and experiences from) carving out the space to do the work you do? (I am thinking that the stigma and barriers you mentioned earlier probably did not disappear (but perhaps shifted), and that there have been frictions, negotiations and perhaps compromises that you have navigated (successfully))? You also mention that you at times may have lost touch with more experimental, artistic and reflective approaches).

MLJ: Absolutely, the stigma exists everywhere -- also at the university. When you work with your own body as a material, then totally normal bodily experiences for yourself, such as for instance menstruating, becomes a contested object of study and one that you need to tread carefully. This is both because of ethical requirements that must be obtained for certain research studies, but also because of the social norms and barriers of what kind of research is expected and promoted to be carried out in a technical university, where research and science has historically been produced and evaluated by men. That means that research for instance on menstrual and sexual health has received low status and there are not many established procedures or norms of how to do that kind of work. Which means that I meet a lot of questionable faces and that I, myself and in my group, have had to set up such norms and healthy and careful practices and generous spaces ourselves. My strategy for this is really to

work on different levels -- infrastructure, people, and norms -- with establishing and maintaining infrastructures, spaces and tools, that promote inclusion and an openness to uncertainty and emotions, as well as healthy, enjoyable and generous collaborations with researchers that I trust and thrive with. As I have also experienced that the research I do have been dismissed and laughed about, perhaps because of its speculative nature, because I use humour, or maybe because of people's own discomfort with the topic, I have also increasingly worked strategically on how to ensure my work is valued and respected, both in my own institution and more broadly. This means that my work has taken a scientific and medical turn, as I seek to explore how the stigma and social barriers may shift when a speculative project also becomes a science project.

Commented [Sha Xin W20]: key

With the inspiration of Matt, and his brilliant story of acquiring a sink in his lab, I actually have in mind that that is something I need for my work: a sink! Because working with bodies, and wet and organic materials can get dirty and may need a clean-up. Few interaction design or electronics labs I have been in have a sink, but that is what I want and need for my work going forward (among the social acceptance and institutional support, of course).

Commented [Marie Lou21]: maybe delete this, maybe bring it forth later

And secondly, I have done a lot of "diversity work" for this to happen, including contributing in diversity initiatives and ensuring that institution procedures for filling harassment and discrimination are in place. This all to ensure that research on intimate and bodily topics can be done with scientific rigour, room for creative exploration, and most importantly while ensuring personal freedom, health and well-being. It can both be risky and exhausting to do critical work that aims to make change on a systemic level, but also extremely rewarding when you meet people that share your vision, or when small things start to change, and you see you have an impact.

Commented [Sha Xin W22]: please keep this! and in fact elaborate this. In the Topological Media Lab, the institution never imagined that a cutting edge computational media lab would want a sink and compressed air, and sewing machines.. Let's gather our stories and motivations, and outcomes.

PSV [comment]: I really appreciate your engagement and generosity in sharing your work, perspectives and personal experience. When going through the above again, I was reminded that one thing I really appreciate with both of you is that you have a lot of integrity. I remember you, Marie Louise, telling a group about the reactions and responses when you took your work to some kind of innovation fair at your university in Denmark (one of these venues/places which are supposed to help researchers to bring their work to market). You have a quality I really appreciate, which is that you at times seem oblivious to the non-recognition or exclusion of your work. When you spoke about it, I got the impression that you went there believing that they should cater to your work (although the model is science-based, male, conventional innovation etc.), and not necessarily shifting out of that frame. I realize it is not quite as "simple" as that, but it was very empowering and inspiring to listen to you talking about this. And Matt, you manifest your integrity through your work, but also through the way you refuse to back down when arguments are not grounded, or when someone is taking an easy path to building things. There is lovely sharpness to this. Also, (and it is easier to see with you because your career is longer), you have consistently made choices that speak to the work and commitments you talk about above, also when this has not been the easy path forward (following the system and the embedded career expectations). Doing this over time has given us a body of work that is important for the questions we are discussing here.

PSV: There are many reasons why I thought of you together for this dialogue, but one immediate prompt was that I heard both of you talk about current work over a couple of weeks. You each talked about projects/collaborations across disciplines and epistemic traditions. The projects themselves were exciting - intellectually and in terms of (potential) real-world implementations. I was particularly struck by how you paid a great deal of attention both to the actual making things happen in these complex and challenging collaborations (where you were active participants) and to how the knowledge making process developed and could be furthered). I think you know what projects/collaborations I am referencing: Marie Louise (MST Microsystems collaboration) and Matt (Smoking addiction). I hope you are okay talking about these (if not, please let me know).

(I wonder whether you could get us started through describing the project, your role/s and experience to get the conversation going (can be as brief or not brief as you like, this is also to get us started, but useful to get a sense). It would also be great if you could talk a little bit about why you got involved in this work (my sense is that there would be much more low-hanging fruit).)

Or perhaps better: What I was struck about with your descriptions was that you both provide excellent examples of the kind of critical-constructive work that I have been trying to get at, and that you managed an inside-outside role (actively working in the projects collaboratively but also reflecting on the process etc.), which gives you unique insights I think. Also in working across epistemic traditions in projects that are substantial but still confined (and more academic I guess than societal). There was also detail and layers of reflexions to your stories. Perhaps a better question is to ask you to describe this inside-outside position in relation to these projects, and again, why you got involved in the first place?

MLJ: Excellent question. Last year, I received funding for a short research collaboration on the topic of Life Science Technology, internally at KTH. I initiated a collaboration with researchers in the Micro- and Nanosystems Engineering department. My collaborator, who has an expertise in microfluidic systems and point-of-care diagnostics, was developing a home-test for urinary tract infections for women, and I was invited to collaborate in this research to both bring a design and user-perspective. The goal of the collaboration was to make the “messy” urinary sampling and testing process easier to perform for women in their home, without the requirement of visiting a doctor’s office. This would involve cultivating bacteria in the home through a product and service between patient, doctors and pharmacy, with the goal of increased sense of autonomy and control in women.

With my previous speculative design projects about menstrual blood and urine analysis, I was extremely interested in exploring and learning from this collaboration with a different discipline that is actually “making real” what I am speculating on — and to a certain degree also thinking critically about! I had no idea about where it would go or what I would get out of it, but I was motivated to immerse myself and learn from the inside of bioengineering of medical diagnostic

tools what kind of body was performed through these tools, and how my lived experience of urinary tract infections was (or wasn't) represented in this research artifact, which designed for women but primarily developed by men.

This collaboration taught me so much about how tools shape and enact our knowledge(s) and where we — as users, patients, researchers, bodies — are situated in this and what we can do to influence these knowledges which become solidified through disciplines and technologies. Both from the inside and the outside out this collaboration, I saw my role as trying to demystify this knowledge and trouble the design of the urinary testing tool, as a tool that both provides knowledge (of whether you have a urinary tract infection, or not), but also a tool enacting the power of medical and pharmaceutical industry, and a tool of knowledge production for individual people as they are co-constructed as human beings and patients in their own home by this medical technology.

What became apparent also for my collaborators were, that my critical and feminist-informed design perspective was not about making the tools easier to use or more beautiful, in the eyes of women (as if I could ever represent such a plurality of experiences). While this might be the dominant idea of what design is and does, I believe I managed, through a number of meetings, workshops, and design provocations (such as sketches, scenarios and prototypes), to open up for reflections on how this tool would act also as a sociotechnical system that positions women as patients, bodies as under medical scrutiny, and the home as a hospital -- and eventually to trouble this narrative and imagine how it could be designed otherwise. So for me, this collaboration was never meant to result in finished products that could be marketed and sold, although that might be the case of the wider research project that I intervened in, but rather to better understand from the inside how medical technologies are developed and what role critical thought and design practice can have in this.

MR: I like this term 'inside-out'! Marie-Louise, I really appreciate the story you tell, particularly the part about how you transformed the expectations that your collaborators had regarding your value as a member of the team.

I have a sort of similar story, though I have to say I wasn't invited to participate as much as I found a way in... I've been interested in the general area of AI and behavioral intervention and was looking for an interesting project. A colleague of mine in computer engineering has been working for the last few years with a clinical scientist and professor of medicine who runs an addiction program at a Toronto hospital. They have been building versions of a conversational agent that uses Natural Language Processing systems to provide automated counselling to help people quit smoking. This project seemed particularly interesting due to the way the bot is intended to replicate a counselling form called 'motivational interviewing', a client-centred, empathy-based counselling process. I was particularly attracted to the ways the interactions between bot and human were being considered and developed and thought there would be some benefits to leveraging STS and feminist technoscience in particular. We've been participating in the life of the project for a few months now and have provided some help in thinking about how trust is considered in the design of conversational bots. My sense is that our

Commented [Sha Xin W23]: key, contra instrumentalization. It may seem obvious to us, but it bears spelling out why you think instrumentalization is poor motivation, in the contexts under discussion. Of course this opens up enormous and inhomogeneous terrain (Husserl, Fox Keller Suchman, Haraway, Stengers, Stiegler, ...), but reflexive (re)framing is part of the challenge at play, yes?

Commented [Sara Hend24]: Love this—and I'm reminded of how, during my pregnancies, the midwives I worked with tasked "me" with learning to read the protein-o-meter in my urine test at every visit. It's simple color-coding on a test strip, easily parsed, but I remember how symbolically important it was to be enjoined in the task of understanding and owning the intelligence of my own body. They handed off one modest mode of expertise; I gained some proactive habits to counter the usual deference to specialists.

Commented [Sha Xin W25]: Augment or Automate? One of the fundamental divides in the design of computational technology is whether it is to supplement humans in their activity or to replace them.

Commented [Sha Xin W26]: Charles Kerns @ Stanford told me of a comparative study of different genres of psychoanalysis finding that the most significant factor correlating with successful outcomes was not the method but the therapist.

Commented [Sha Xin W27]: This brings to the fore one of the most fundamental challenges posed by AI, or more concretely, machine learning and other algorithmic pattern recognition. Any mechanical method, by design, and indeed by definition, is indifferent to human intent, concern, care, judgment or value. Some technology-centered perspectives equate this indifference with justice

biggest value is in providing a deconstructive lens to the project and re-opening up previously under considered opportunities. For example, recently we have been thinking about the criteria of 'humanness' in AI and conversational bots and leveraging feminist posthuman starting points as an alternative to typical design choices. For me, the key to this work is not just in denaturalizing things like 'humanness' but also in utilizing this to provide operationalizable insights that help resolve issues the broader team is facing. Like Marie-Louise describes in her example, the main value we provide is in spurring the imagination of the developers. But my hope is that we will also be able to help them translate these alternatives into actual changes to the system they are building. That seems to be the hardest part for most of us critical speculative folks! I think this is actually the new epistemological clog we need to address.

PSV: This is great. I appreciate you sharing your experience from these projects. Your generous descriptions help ground things and point to the complexity of this type of work. It is also practice that I think is key to moving in the direction we have been discussing (building humane infrastructures etc.). What strikes me too is that your "interventions" are not only or mainly (or at all) about contributing a bit of "deconstructive knowledge" or "design competence", but that your interest (and I would think, your practice) is about shifting the logic and frameworks at play together with the participants.

I think you use a slightly more "active" vocabulary in your description, Marie Louise - provocations, intervene etc., Get me right, you provide an active framing, Matt, but a little bit more removed at times ("provided some help in thinking", "provide operationalizable insights"). Interestingly Matt ends with the operational aspect (and actual changes) and Marie Louise with better understanding the process.

MR: This is a good insight Patrik. I use these somewhat passive terms because I actually don't think of what we are doing in this project as 'intervention' but as being part of a collaborative process of design. While we are bringing new insights to the broader team, we aren't doing this in opposition to them or as a way to 'discipline' or enlighten them. We all share the same goals in working towards an equitable, beneficial socio-technical system. If I didn't think the rest of the team were not similarly inclined, I wouldn't engage. This is somewhat different than using a process of design and making as a form of deconstructive criticism (what I called 'deconstructive making' above.) I will say that the engineers and computer scientists I know are both pretty open to new perspectives but also fairly sensitive. As are we all.

PSV: Yes, makes sense. And important not to create or reinforce positions as oppositional (as I did, perhaps). I think what I am interested partly is the granularity of processes of informing each other, and your (as well as Marie Louise's) unique competence in being productive in such processes - which necessarily (I would think) involves intermediate/translatory/catalyst work - working at the intersection of others' being open to new perspectives/having similar goals/being "sensitive". You are part of making the insights valuable and implementable (I would think) - i.e. even though you share the same goals someone with your competence can be key to bridge/shift/turn inside out (I would think, perhaps more than my reading of "bringing new insights" would entail) - and perhaps also align goals (theirs and yours).

Commented [Matt Ratt28]: Forlano, L. (2017). Posthumanism and Design. *She Ji: The Journal of Design, Economics, and Innovation*, 3(1), 16–29. <https://doi.org/10.1016/j.sheji.2017.08.001>

Braidotti, R. (2013). *The Posthuman* (1st edition). Polity.

Commented [Sara Hend29]: Yes indeed—I think this capacity (what I think of as operating with a relational model of change in mind) is sorely underrated.

PSV: A question for you Marie Louise. You came to your project as a very “proactive” interaction designer. How did you negotiate this role with the expectations of the other participants? I would assume this is challenging work. How do you do it? How would you describe your role? And did you allow sketches and design provocations to be refuted (which I think is often the way it works in other contexts, the “customer” gets to choose)? And how did you avoid that the (radical) troubled narratives you helped evolve lived by themselves outside the core operation (science, medical technology as a framework) of the project?

MLJ: I would say that my role shifted and evolved throughout this collaborative project, both in negotiations with the collaborator and through my own reflections. And I believe that was actually fruitful, because if I approached my role as too fixed I wouldn't be open to what could be learned in this collaboration. So it was a balance between living-out some of the normative ideas of what design and designing is, and transcending design's purpose itself towards questioning some of the implicit assumptions held in the project and reimagining other ways of designing not just the technology itself, but also the relations it creates and the context in which it would be used. The actual design interventions -- sketching, prototyping, storytelling -- actually lead to the most transformative moments in the team. We had a sketching session, drawing silly surreal urinary system, which really broke with the expectations of what could be designed and helped reorient design's role in relation to medical technology and engineering. These sketches were definitely refuted by my collaborators, but they were also not intended to be implemented in the first place. A master's student working with me in the team designed a beautiful prototype and wrote a story about urinary tract infections and the role of this diagnostic tool in the home; again, this design intervention lived partly outside the core operation of the project, but on a meta-level it served to reorient our expectations to the role of the designer, and more practically it situated the body of “the user” in this technology development, and it thickened the context in which this medical technology will be used. For now this collaboration has been paused for a while and the project will be developed into a product, but it has taught me something that I will bring with me into new collaborations with scientists and engineers; I don't believe we need to share the same goals or values, although that does make the collaboration easier, but we do need to be open to each others' disciplines and respectful for them and what contribution each makes.

PSV: And a question for you Matt. You say that you have helped your collaborators to consider trust in the design of conversational bots, Matt (which is an important issue). I am curious about how trust plays into the interpersonal, cross-sectional work you do with your collaborators? And what about tension, resistance (?) and integrity? And how would you describe your role (which to me seems like a very 'active' one)? How do you draw on the experience from the critical making lab etc. to intervene (and is intervene a good word to use?)? Are the operationalizable insights you can help provide somehow semi-external to the project work or are you part of designing the bots?

MR: It's very hard to 'fly in' to an existing project and begin to critique the work they are doing. I think this is one of the main reasons so many 'critical' projects from the social sciences and

Commented [Matt Ratt30]: sorry, added the above stuff before reading this question. Maybe delete this highlighted line?

humanities fail to have much of an explicit impact on current socio-technical work. I do think critical STS and design scholarship often does slowly transform current technical practice through a kind of implicit, 'trickle down' process whereby norms of behavior, commitments to appropriate outcomes, and expectations regarding scope of practice are changed. But for more direct engagement, negotiating disciplinary knowledge, epistemic double-binds, and, ultimately finding common ground is absolutely necessary. This involves, as you note, tensions, resistance, and balancing your own values and objectives as a critical scholar with a care for the perspectives, goals, values, and objectives of others on the team. And, ultimately, this really involves being complicit in the results of the shared work and acknowledging this and being responsive and responsible for what is created in the collaborative process. These are always monsters, as Leigh Star, John Law and others noted; monstrous, often uncontrolled and violent, but ours none-the-less. Being accountable to them and for them - that's the hard part.

Commented [Marie Lou31]: so true and also so difficult

Commented [Matt Ratt32]: Law, J. (1990). Introduction: Monsters, Machines and Sociotechnical Relations. *The Sociological Review*, 38(1_suppl), 1–23. <https://doi.org/10.1111/j.1467-954X.1990.tb03346.x>

PSV: Thank you very much Marie Louise and Matt. I appreciate your responses. It is also worth noting, I think, that what we are talking about here are two projects (examples) that reflect and manifest your work interestingly and importantly, but still only constitute a small part of your full body of work. In any case, it is great to see the issues, overlaps and differences across your approaches.

What you say makes a lot of sense, Marie Louise. And coming to it from the position of design and being a designer gives you some license to intervene, which you use to live and transcend design. I remember Natalie Jeremijenko talking about how she moves between different roles, and how she finds the role as an artist often most useful to actually getting some license to imagine and build (although art sets up constraints and expectations, just as design does, but different ones). I totally agree that respect and building across disciplines and expertise is key (whether within or outside the academy). Also, design naturally comes with process and methods (sometimes problematically, but still), which allows you to work over time and to use sketching, building prototypes etc. And using sketching, prototyping etc. conceptually and to reorient the frame (as you indicate) seems like a powerful strategy.

And Matt, thanks for bringing up the issue of complicity (among other things). It is central I think, and one of the things that seems to be very difficult to come to grips with if you start out from a deep, critical perspective. For one thing, that critical work tends to be focused elsewhere (distant), but there is also often (not always) a very strong denunciation of that which is being studied (and the structures, people), critiqued even if that is part of your own lifeworld, infrastructure, privileges and - potentially - responsibilities. This position (perhaps caricatured here) creates limited space for being involved in remimagining and building things together. There has to be a space, an arena for doing this kind of work I believe. And it does not have to be about giving up the humane/humanistic/important values or not being radical, but engaging in dialogue and moving forward together. Asking difficult questions, using the power of turning things upside down, suggesting critically informed ways of moving forward that also make some sense to collaborators. I guess this also means that you have to accept that change takes time and that there are multiple viewpoints, levels and interests. Also this kind of approach does not preclude critiquing actors, providing systemic critique etc., but I believe you need to come to the

table to change things for the better. And I also believe that it is important that the humanistic/critical/humane can invite others to the table.

PSV: At this point, I will pose one more question (and possibly a follow-up) before we invite in the visiting conversationalists. But first there is some space below if you would like to speak to the above - the other person's responses, my comments, your thoughts etc.

MLJ: Patrik, I really like your example with Natalie Jeremijenko and how the role one ascribes to oneself gives you a certain license to imagine and build certain things. When you describe and position yourself as a researcher, designer, artist, engineer or scientist, it comes with a set of expectations and license-to-do-stuff, which other "roles" may not allow for. This may both be the access to tools and machines and materials you are allowed to use, but also to certain knowledges that are (or are not) accessible to you. I think especially for the creative role of a designer or artist navigating in technology and medical-scientific spaces, this role is particularly strong and both brings certain opportunities but really also hinderings. Some spaces you are just only included and invited to if you position yourself as a scientist. So I think that the "shape-shifter", one that is able to change form and identity, as conceptualised in mythology, folklore and speculative fiction (for instance the witch) is really interesting and relevant as we are thinking through collaborative and interdisciplinary processes.

MR: great point - I love this subjectivity! My model is somewhat more old-fashioned - I think of the bumbling detective, Peter Falk as Columbo, always listening, ready to get his hands dirty, redirecting attention, generating insight when you least expect it. Maybe that is a bit too much of a 'hero's journey' but oh well...

MLJ: Patrik, I also really appreciate your critical reflection on who is invited to the table, and perhaps the extent to which you as a critical scholar are situated as/within/part-of that which/those who are being studied, critiqued, or emancipated, or if you keep more of a distance. A lot of my work initiates from lived experiences and that which I've come up against, and I always try to bring myself into the work as much as possible, but I acknowledge that that also comes with limitations in terms of representation and my partial perspective on the plurality of worlds we live in. Thinking along these lines, perhaps the most radical collaborations I, or we, can nurture, are not those with for instance medical technology companies or within industrial or academic institutions, but those with communities, organisations, and partners outside the industry and academia. Can we think of the inside-outside both in terms of our collaborations with industrial or academic partners from other disciplines, both also in terms of those structures and systems we hope to change and/or the communities we wish to support?

PSV: Going through the conversation, I am struck with your confidence in the power of critical thinking/work to enact change, as well as your persistence in pursuing ways of doing such critical-constructive work and reflecting on it. There is substantial range and complexity at play here which you both address, from the small change you talk about Marie Louise to maintaining the infrastructures, spaces and tools needed, and addressing the "structures and systems we

Commented [Patrik Sv33]: Thanks for contributing importantly! I have added some notes and comments. Feel free to engage with each other and/or me. There will be one more question before moving on. And please let me know if you have any concerns or anything you would like to bring up.
@mjuulsondergaard@gmail.com
@matt.ratto@gmail.com

Commented [Patrik Sv34]: Also thank you for your patience!

Commented [Matt Ratt35]: great point - I love this subjectivity! My model is somewhat more old-fashioned - I think of the bumbling detective, Peter Falk as Columbo, always listening, ready to get his hands dirty, redirecting attention, generating insight when you least expect it. Maybe that is a bit too much of a 'hero's journey' but oh well...

Commented [Sara Hend36]: Yes—and Krzysztof Wodiczko theorized about this a bunch, too, from his training in classical industrial design to fine arts and then working in context of MIT engineering. He often cited Kristeva's notion of the "baroque personality," which I still don't fully understand. But it's the same shape-shifter idea.

Commented [Sha Xin W37]: Perhaps we can avoid hylomorphic altogether if we interpret our experiences in terms of "seeing-as" (Wittgenstein's duck-rabbit" not as am apriori-subject regarding an a priori object, but an ever-developing co-articulating of relations + subjects + objects)....

Commented [Matt Ratt38]: yes, the 'seeing as' is so important. Not just turned inward as a way to understand our own positions and perspectives (shape-shifter, baroque personality, etc) but also learning to understand and inhabit the 'seeing as' of others, in particular (I think) in the ways they (and we) have been 'disciplined' by our epistemic and ontological contexts. Shape-shifter, yes, but also epistemic boundary crossers and translators.

hope to change". Matt, I really value your programmatic stance (not least when you do the a-d list of what we need to do), as well as your attention to the detailed interconnections between an impressive array of critical approaches and constructive moves. You also talk about tools out there and their use (although veiled) in some design and engineering work, and the need to have a commitment to enacting change.

I am working on a chapter on "instrumentalizing the humanities" (humanities taken very broadly). When we have collaborated earlier, I have described "staying with the trouble"/troubling design and "critical making" as tools/methods/frameworks in the context of critiquing, imagining and building humane infrastructures. I think of tools and toolsets as boundary objects and processes. In the chapter I look at terraforming, infrastructural inversion, designing for difference and other approaches as tools, as part of a toolset that ideally can be legible both to the outside and the inside. I was wondering whether you could speak to the idea of humane/humanistic tools as part of a toolset and framework, and more generally perhaps, comment on the idea of instrumentalizing critical knowledge.

MLJ: That sounds like a fascinating chapter, and perhaps one that can also stir some debate. The idea of "instrumentalizing" critical knowledge could read provoking to some, I guess, but I think it is interesting to think about what instrumentalization could mean from a humanistic perspective. Like with the words "tools/toolsets/methods", instrumentalization comes with a certain worldview and set of values, which, as I see it in your work, the humanities is part of questioning and rethinking what those values are. In design research, the instrumentalization of design has been critiqued a lot, for instance as solutionism, and many practices like speculative design, critical design, and maybe critical making(?), are ways of breaking away from measuring design's success only through its use value. So thinking of "instrumentalizing the humanities", and the role and perhaps "use value" of humanities in society and societal challenges, I think the first question to ask would be "what can critical knowledge be used for?". My best answer to that question is that the value of critical knowledge exists in its ability to analyse/critique dominant structures, and imagine/propose/build different ones. "Tools/toolset/frameworks" can help in this process as boundary objects that point in a certain direction. But tools/methods/frameworks are often perceived as neutral, free of values or ideology, as well as applicable across situations and contexts. In contrast, "humane/humanistic tools", as I see it, would seek to be self-aware of its own position as "tool", as a change-making instrument that invites for a certain direction. But a "humanistic tool" would also allow for a flexibility for different uses and be "just open enough" for interpretation from plural perspectives. I see the value of such humanistic tools as critically- and theoretically-informed change-making instruments to be used in interventions in particular situations; perhaps inviting for a constructive practice, a technical practice, a legal practice; in any case, in practice-oriented interventions with the aim of fostering change in society. Whereas these tools might operate on a practical level, yet always also in relation with theory and concepts, toolsets and frameworks operate on a more abstract level. I am always avoiding generalisable theory, and instead work with theories that are "just big enough" (Haraway). Troubling design was an attempt at such a intermediate theory, or a framework, of a design program informed by critical and feminist theory. A recent toolkit I developed, Menarche Bits, was similarly an attempt to create a toolkit for both building

technology but also building conversations and resilience, and thus working as a socio-technical system.

MR: I Agree with ML that we have to be a bit careful thinking about the instrumentalization of humanities knowledge. As the old joke goes how do you tell the difference between a humanities scholar and a social scientist? By the existence of a methods chapter. Which is to say that the humanities has always been a bit equivocal about explicit methods. I think this has been both a freedom and a curse in that translating the critical humanistic work from interpretive scholars has always required a couple of extra steps. I also agree about having tools that are just enough – just enough to do the work that we need to do in the moment, just enough to help us translate the complexity of our perspectives and positions into appropriable knowledge, just enough to clear our own minds and to encourage our own critical reflexivity and, more importantly, the reflexivity of the others who are even more complicit in the work. I used to think that the main problem with socio-technical systems was that they were developed by people who were working from a more depleted, instrumentalized base, a base with a rationalized ontology that also denied the existence of alternative starting points. But while this may be somewhat true, it's a terrible starting point for creating collaboration and change. In doing more applied work, I now believe that the failure really sits in the gap between the rationalistic, reductive, instrumental forms of technical work and the imaginative, expansive, critical, situated and embodied forms. We have to increase the work in the middle, carry out experiments and practices of transduction and translation to fill that gap.

PSV: As I think you know, I am interested in the question of capacity building at some scale. Building capacity to mobilize humanistic and humane knowledge / experience to collaboratively respond to societal-academic challenges and problems. This is where the tools and the instrumentality comes in. I believe that we need intermediate arenas/platforms/zones/infrastructure beyond individual initiatives (which often tend to be focused on particular questions or perspectives, and also tend to be precarious). There is strength I believe across methods, perspectives and epistemic traditions (and dialogues like the one we have been having). Get me right, existing initiatives are very important, but I think there is potential and a need to leverage and build on such work. I am driven by academic social needs, people like yourselves invested in critical-constructive work, and the searching for platforms I see not least in early and mid career scholars and experts. I also think very broadly of this enterprise in terms of interaction and uptake (ranging from the conventional humanities to corporations), but there has to be a humanistic/humane foundation and logic. I believe such work requires qualities we discussed above, including respect, shape shifting, bumbling detective work, generosity, sharpness, edge, integrity, tension, will to change, curiosity etc. It is also not necessarily a question of scholarship or applied work in the world, I think it can (and should be both).

And here is my question: What is your advice for the kind of capacity building I am talking about? What is missing in this picture? What is the next step in your mind? Would you want to be part of an enterprise like the one I am describing (and if not, what would it take)? What would you be eager to contribute?

MLJ: Capacity building really needs to operate on multiple levels, globally and locally. The academic community is great at developing and sharing theories, approaches, and tools globally. I am myself really inspired by recent work that intersects humanities and constructive and technical practice, such as Winnie Soon and Geoff Cox's Aesthetic Programming, and Sasha Costanza-Chock's Design Justice. Theories like theirs are seeking to mobilize humanistic and justice-oriented values in technology development, and they inspire and fuel academics and practitioners globally. What we need to do, to ensure that such works gain the impact they deserve, is to continuously focus on how we build capacity locally. So how do we build and maintain infrastructures where critical-creative work can flourish and perhaps be instrumental in creating change? I think this is best accomplished through rethinking our existing educational and research infrastructures, and by academic institutions to nurture long-term relations and collaborations with both industry, the public sector, and communities. And then there is a huge need to relocate value and money to the actual constructive practice of crafting new objects and telling new stories. We need more concrete examples of how all this is done well; both the failures and successes of such local capacity building. I believe the next step is really to emphasize and nurture the critical-constructive work, and academic institutions should go in front to make sure that that happens. Maybe education and curriculum need to be rethought, maybe the spaces in which we do our work needs to be redesigned, maybe the ways and with whom we collaborate needs to be revived. Maybe all of them and probably more that will only become known when one stands in the situation and meeting with other people, materials, and thoughts.

MR: After many years talking about critical methods and focussing on them within my writing and scholarship I've really come to realize that the most important next step is the **internalization of reflexivity within technical work**. Phil Agre really highlighted this need in his call for a 'critical technical practice.' As I said above, I think the real need is in developing practices of transduction and translation, as technologists we need to open and share technical possibilities and potential futures and as humanists we need to reopen those, think through what they offer, and explore and propose alternatives. But most importantly, we have to attend to the epistemic gaps that exist between those two modes - even within ourselves - and work deliberately to find a new standing. Above, ML described a prototyping practice that she used as part of this process - I think **prototyping is a core part of these acts of translation** and one that still remains underutilized by many critical scholars. Most contexts still lack the critical intellectual and material infrastructures (like sinks!) that could bring prototyping as critical translation into being within the humanities.

PSV: Thank you both for responding to my somewhat provocative framing! This is so incredibly rich and useful. Many things to think about and take into consideration. I will need time to process this, but for now I have just taken some quick notes below before inviting our visiting conversationalists.

I love your positioning of humanistic tools, Marie Louise. This is similar to my own thinking. I have taken notes about critiquing-imagining structures, self-awareness, change-making

Commented [Sha Xin W39]: key

Commented [Sha Xin W40]: we use ensemble creation and play practices from musical, dance theater performance : prehearsals. See Synthesis stream <http://synthesiscenter.net/projects/prototyping-social-forms/>

Commented [Matt Ratt41]: that looks fascinating - I'd love to see more of the nitty-gritty of that work!

instruments, flexibility/just open enough for plural perspectives/just big enough, the concrete-abstract axis (this is one of the reasons I think it may be useful to talk about toolsets). The point you make about building conversations and resilience is important too, and relates to the boundary object/processual perspective I brought up. Will look at Menarche Bits!

And from your response on the tools question, Matt, I have taken notes about the couple of extra steps you speak about. Very true. Also about tools that are just enough to do the work, your emphasis about reflexivity (in several ways). I also appreciate your own reflexivity in relation to your own work (as we have seen in this whole conversation and in your work more generally, sets an example really), how you have shifted positions (I have been uneasy with the simple 'depleted/instrumentalized' basis argument, which is quite common among humanists) and what it takes for collaboration and change. And yes about the work in the middle - which is something which I think we all have brought up in different ways.

And also yes about being careful with regards to "instrumentalization". The way I think about it, such a framing is in itself also a critical and constructive move, and perhaps also a way to open up a middle space.

And with regards to capacity building (the second question), I have taken copious notes too, including your point Marie Louise about local and global capacity building. This is a major challenge, but also one that has to be addressed (moving between scales, and not always stopping at the local/situated or starting from the generic, standardized, uninflected, rethinking aggregation etc.). I am thinking too of Kian Goh's point about "big justice" that she made at the UCLA workshop on humane infrastructures (as you know she is an urban planning professor, architect and green deal researcher/thinker among other things). There are all kinds of risks, and navigating in the way you describe makes a lot of sense. I totally agree about the need to rethink our own academic infrastructure, and I find your stance truly inspirational. Some would probably be more skeptical about the power of academic institutions (seeing them as "wrong", not the place to drive change, too complicit, too slow etc.), but I think there is a real opportunity here (which does not mean that there are not also opportunities elsewhere). It is not just an opportunity, but a responsibility.

Matt's (repeated) point about transduction and translation is central for such responsibility taking. Also in the sense of having/creating a vocabulary, processes and examples (and arenas) for such work. I think of it in terms of conversations, collaboration, critiquing-imagining-building together, negotiation, building trust etc., and I think the humanistic needs to retain its "sharpness" and integrity in such processes without standing outside, at least not all of the time. I also believe we need arenas for such work.

We have used inside-outside as one theme for this discussion, and I am struck with how it comes up again and again in our conversation - also when Matt discusses positions within ourselves. And acts of translation (as you call them) such as prototyping are important. And as Marie Louise's example earlier demonstrates, prototyping itself is a frame that can be shifted and challenged (just like infrastructure). An aside note too, that we have just kicked off the

second conversation in this series on “Changing Ourselves - Climate, Carbon and Concepts” (or something like that), and I am struck with how Daniel Pargman’s (KTH) early invocation of an enactment/visualization of academic flying at KTH gives rise to all kinds of insights, questioning of the model (and the data), and possibilities for rethinking, rearranging, reprioritizing etc. This model is made out of chips on post-it notes.

PSV: I am now very happy to introduce our two visiting conversationalists/discussants/interventionists. I am still trying to figure out how to frame this part, but the idea is to bring in other perspectives and competences - key people - to the discussion that has been going on for about 20 pages now. For a while I thought of it as a crit session (like in art education), but it is not meant to be a review, rather provide a space for (generous) conversation, input, questions, reflections, other perspectives etc. We will see how it goes!

We have two stellar visiting conversationalists: [Nicole Anand](#) (NA) and [Sha Xin Wei](#) (SXW). I am so grateful you have agreed to be part of this. Thank you! Your work is inspirational and central to many of the things we have been discussing. Anchor points (for example) include Nicole’s recent [co-authored essay on elephant problems](#) (which among other things relates to governance and multistakeholderism, with An Xiao Mina) and Xin Wei’s [scrapbook notes on prototyping social forms](#).

Instead of doing lengthy introductions (which you both deserve), I would like to ask you to introduce yourselves briefly. Not CV style, but just a few words where you come from, why you (hopefully) find the theme and discussion relevant/interesting, and what in particular you think you bring to the conversation. I hope this makes sense! After this, I will give time and space for interaction.

NA: Growing up Indian American in an affluent white suburb of Los Angeles meant that I felt different when I was young. The day I moved out to attend UC Berkeley I felt a somewhat immediate sense of belonging. In my career, it is my search for *belonging* that turned me into an avid *multidisciplinary* practitioner and educator. It’s at the intersections that I feel belonging.

These intersections are numerous: practitioner/educator, political economist/participatory designer, open global governance/subnational governance, civil society/ bureaucracy, design researcher/strategist, Angeleno/cross-cultural traveler, Indian/American (child of immigrants) etc.

My experience working in intricately tangled intersections is what shows up in my equity, research, design, and systems practice and pedagogy. I think the messy intersection of human, social, and technological is one I’ve played in quite a lot, and I look forward to learning and contributing to this space.

SXW: Thank you Patrik, Marie Louise, and Matt, and Nicole for your singularly rich accounts of your experiences and your perspectives. I’ve already learned a lot from reading through the

Commented [Sha Xin W42]: A great way to present issues of perspective, context. Approaches from processualist and developmental thought (Simondon, Whitehead, Deleuze and Guattari, Grosz, Stengers, Catren, Longo, etc.) may prove fertile...

Commented [Sha Xin W43]: For the main project page, see <http://synthesiscenter.net/projects/prototyping-social-forms/>

conversation thus far. Let me introduce myself via links to the [Synthesis center for transversal research at ASU](#), my [academic, artistic and public work](#), and to a recent commercial startup [Weightless Studio](#) based on Montreal.

Most of my notes are in longhand on a tablet -- which I'll transcribe here asap -- but let for my part let me elaborate on Patrik's question on capacity-building. It may be useful to tease apart capacity-building from scaling. While both are terms of art among administrators and policy makers, "capacity-building" seems to me more amenable to an ecologically affirmative interpretation than "scaling".

A diagram of molecular scaling : catalyst (metabolism) rather than homothety (geometry)

When I animated the year of Pervasive Play with Patrick Jagoda at U Chicago's Gray Center, one of the propositional questions we asked of well-established scholars and master practitioners as : *"When you reach the limit of your method, what do you do next?"*

PSV: I would also like to give Nicole and Xin Wei an opportunity to comment on the discussion so far and ask any questions you may have to Marie Louise and Matt (let's say we start with one comment and one question from Nicole and Xin Wei respectively in order not to overload the conversation). Let's start with Nicole.

NA: Thanks Patrik. This is a fascinating conversation and I've really appreciated all that Marie Louise and Matt have said. It's hard to pick on just one thread, but I will try. I am intrigued by the "roles" dialogue that sparked vivid images in my mind of the "shape shifter" and the "bumbling detective". Since I am both a practitioner and an educator, and I tend to cross in and out of NGOs, bureaucracies, academic environments and so on, I am constantly thinking about how multidisciplinary practitioners operate within a world with entrenched disciplinary silos (and [dominant expertise](#)).

At UNDP, where I spend a great deal of my time these days, I am trying to integrate across climate change, health, digital transformation, gender, etc. experts - it's proven to be a tremendously hard task. At Parsons, the MFA program I teach Design Research in - Transdisciplinary Design - is one of the only spaces I've felt is able to nurture an environment that celebrates and enables plurality in cosmology, epistemology, ideology and so on. So now I am stuck on how we can do the same in institutional environments beyond the small "safe spaces" within them. My question is not new, and many social innovators have been asking it, but I realize that we might have the right set of preconditions at this moment in history to *act* on this question in big ways.

So my related question to Marie Louise and Matt is: when have you seen shape shifting / bumbling detective work possible even when the conditions were not ripe for this mode of operation? And are you seeing situations / environments that have fertile ground for embedding multidisciplinary ways of working in them?

While I see how COVID-19 has made people more aware of the need for multidisciplinary and systems practice, I continue to see how the enabling environments in many cases have yet to be built for these practices to thrive.

MR: Hi Nicole, nice to chat again! Yes, I think there are new opportunities for interpolating more critical perspectives into important contexts with some shape shifting/Columbo work! I am certainly finding some chinks in the wall of instrumentality within digital systems. I think we are seeing some fundamental shifts in the terrain of computational work and associated education. This is being driven by an increased recognition in the deeply problematic results of current digital systems and a sense that alternative starting points are required to create more equitable outcomes. I am seeing some computer science departments and associated fields being more open to novel perspectives. I'm not sure I would call this 'fertile ground' - more like all churned up and confused land - but this offers potential room for functional change.

MLJ: Hi Nicole. Thank you for sharing your story of searching for belonging. How you describe your intersections is exactly how I see this shape-shifting – being between and being both, and crossing in and out of different disciplines. I agree with Matt that computer science is more open for multidisciplinary perspectives from humanities, social science, and artistic disciplines, but the environments still need to be built and continuously nurtured in order to be fertile spaces where people thrive. Otherwise such multidisciplinary work remains to be one-off, precarious labour, and the people who do it will sooner or later want to leave. Artist residencies in software labs, for instance, can create new collaborations and a sense of change, but such multidisciplinary ways of working need to be more deeply embedded in the institutions. And that takes money, time and a will to change and distribute some of that authority, power and privilege that more established siloed disciplines have been sitting on. I do think that design environments have a fertile ground for multidisciplinary, even transdisciplinary, work! Currently I am part of two research collaborations in Sweden and Norway with computer scientists, medical doctors, care personnel, and technology developers. And what that has shown me is that within academic institutions working with external stakeholders, funding (money and time) is absolutely key for anyone to show up. And if people show up, then facilitation of collaboration is necessary. Designers today are more and more well-equipped to facilitate such collaborations by navigating conflicting interests and diverse participation. In my experience, futures thinking and imagining future scenarios have actually worked quite well as a multidisciplinary way of bringing different people and disciplines together to address and respond to major global challenges, in ways that also embrace plurality and difference in experience across people. So perhaps environments that embed critical work, participation and collaborations, and futures speculation, could be such a world that fits many worlds, but I am still looking forward to finding that place and contributing to its growth.

PSV: And you Xin Wei (comments, question on Nicole's shapeshifting question and the responses)? Also, feel free to comment on the larger Marie-Louise thread too. And a more concrete thing (feel free to start and stop here for now if you would like) - I know you have an interest in what comes after (or not) mostly university-based innovation and development - how do we affect change and build humane infrastructure that actually make into the market and

Commented [Nicole An44]: I love the use of the term "confused" here. I've been working a lot with "confusion" lately and how to help bureaucrats and 'public sector experts' embrace confusion and view it as an invitation to learn and explore, rather than a poor result related to a negative emotion.

Commented [Nicole An45]: This really resonates with me. Basically, the devaluing of these ways of working, leads to burning bridges, abrupt exits, burn out and so on.

Commented [Nicole An46]: Wonderful, and I am very curious to hear how these go. UNDP is trying out something similar in terms of the wide variety of collaborators to examine complex development challenges. Futures and foresight are also the methods that are often brought in to guide these processes at UNDP. I've seen Justin Cook at RISD's Center for Complexity take a good crack at this as well. At Parsons, owing to the 'transdisciplinary' focus (as opposed to multi or inter disciplinary) I would say that we've spent less effort keeping people in their disciplinary siloes and exchanging, and more time finding those folks who are open to unlearning their expertise to create combinative practices (that could look very different than their original expertise). Do you know of ongoing explorations of the different ways of facilitating multi, inner, trans disciplinaryity? I've done some research of practical initiatives for the collective I co-founded, but I am wondering if there is some strong academic literature out there.

Commented [Marie Lou47]: I would really like to hear more about the UNDP work with futures!! I followed the collaboration between DPPA and Design Futures initiative closely, and had a whole interaction design class following their brief. That was really interesting, but I am not sure if the effort and findings fed into something more long-term. Regarding academic literature on disciplinaryity, nothing comes to my mind: only this one which is a bit related to the discussion on technology development, policymaking and speculation : <https://dl.acm.org/doi/10.1145/3290605.3300314>

Commented [Sha Xin W48]: We'd love to collaborate further along these lines: <http://synthesiscenter.net/projects/prototyping-social-forms>

(of which our UNDP alternate reality role-playing simulation is a strand)

society, beyond university labs?

SXW: It's such a pleasure to weave into these multi-stranded considerations. Perhaps one way to both respond to and contribute related strands would be to invite you to see the performance-talk my Synthesis team and I presented at ASU: [I-We-World – Ecosystemic Design](#).

One alternative to both disciplinary capture and shape-shifting, which are both symptoms of the cladding of mutually incommensurate and immiscible epistemic cultures, is a particular sort of research-creation introduced and hosted at the Topological Media Lab -- creating experiential experiments for improvisatory ensemble creative activity. (See "[Recherche-Creation](#)" at [SECT VII University of California Humanities Research Institute talk](#).)

Having worked for many years in multivalent contexts, I'm most sympathetic to the tension between academic scholarship and industry-facing or world-facing work. I guess the main discriminant should be : whether and how one "makes a living": is one paying the rent, so to speak, primarily based on one's affiliation with an academic institution or with a commercial (private) sector enterprise, or some other economic institutional enterprise?

For a more nitty-gritty reflection on the experience of building the institutional experiment -- Topological Media Lab -- born in Atlanta / Georgia Tech, transplanted to much richer earths in Hexagram / Concordia / Canada research funding / Montreal / Quebec: [The Atelier-Lab as a Transversal Machine](#)

The Synthesis Center has gone through its phase as an atelier 2013-2019 carrying on experiential experimental research-creation in dialogue with process philosophy and critical studies of emerging technology and science. It's been transitioning into more of a "slime-mold" even more embedded in the public, NGO sectors and beginning to feel its way into private / semi-public sector design / urban planning. At the same time, its affiliate PhD's and researchers are working more deeply into some more fundamental projects: <http://synthesiscenter.net/research/>

PSV: [While we are waiting for Xin Wei](#), I would like to ask you Nicole (and thank you so much for your introduction and questions!!) how you look at the level of governance and multistakeholderism in relation to design in the context of responding to societal challenges. You bring extensive and unique experience, insights and competence to the table (which is one reason why it is wonderful that you are part of this conversation). It seems to me that it is a perspective that sometimes does not get enough attention - that in imagining futures and engaging critically and constructively, we do not necessarily move beyond a certain level (perhaps ideationally and materially stuck). I know that governance and policy are two different things, but I think I would argue that both these are often displaced or not activated. When I think of capacity building I think of scaling up not only to become bigger/more generic or whatever, but because we need scale and multistakeholderism to tackle the challenges at [stake](#)? Doing constructive work is also about operating on the level of governance and policy -

Commented [Sha Xin W49]: Been here, done that :). Thanks Patrik!

Commented [Patrik Sv50]: A really interesting piece by Hillary Angelo and Kian Goh "Out in Space: Difference and Abstraction in Planetary Urbanization" - on scaling kind of <https://www.ijurr.org/article/out-in-space-difference-and-abstraction-in-planetary-urbanization/>

changing processes, frameworks (in my work on infrastructure I think it is as important to change the frameworks and the “logic” as the actual infrastructure) etc. Does this make sense to you? And are there ways we can make such work easier?

NA: Yes, it does make sense, Patrik, and thank you for the question. I think the reference to ‘scale’ is an interesting one because somehow embedded in that is the belief that a governance process (e.g. budgeting, policy-making, service delivery programming etc), is ‘at scale’ while designing a product is not. While my practice is focused on the latter, I don’t buy into the ‘truth’ about difference in scales. When I look at products that have transformed cultures, behaviors, and so on, and policies that have acted as nothing more than paperwork, I could make quite the opposite argument.

That all said, there are reasons I work in the public/social sector and why I think it is severely in need of Systemic Designers and design practices. And perhaps also reasons as to why we see many designers confront a desire or feeling that they need to be working on changing systems, beyond products. The reasons are multiple but I’ll come back to your term of ‘constructive work’ to explain.

Societal - institutional, cultural, behavioral etc - change happens in a multitude of ways and from a governance lens, we see institutions as the key to creating change because institutional stakeholders hold the keys to the rules and norms. Policies developed by institutional actors are decision makers creating agendas that define the ‘rules of the game’. So yes, on the one hand, focusing on those rules and changing them will create potentially widespread and lasting changes. On the other hand, I spend so much time bending those rules.

I believe that you need to know the rules and norms to then find ways of creating alternatives to them. That’s what then gets us into the invisible and the tacit, and frankly the much more interesting bits of systemic design in the public/social sector, and also it is the connection I see to all kinds of design outside of these spaces. It’s the practices that are influential that are not written or formal that designers explore. Dan Hill and others talk about ‘dark matter’, others talk about what’s in the shadows, or making the invisible visible. **I like to think of these spaces and practices that influence social change as unseeable to many, but unforgettable to some.** In other words, in the BIPOC and Global South communities that I tend to spend time within, we often say what is obvious to us, is not obvious to others.

Back to the rules, because we all play by different rules. As such, we can believe that the ‘constructive work’ to positively influence societal change is to both design within the formal structures of institutions and policies, and to design with the “obvious” of some that is also not formalized, widely valued, or well-understood. There is value to be added to the latter in all forms and spaces of design that go well beyond the governance sphere.

PSV: I would also like to introduce another visiting conversationalist. Sara Hendren is at Olin College and really leading the way as to how to connect critical thinking/frameworks with making/design/art. In an honest, respectful, imaginative, student-centered, reflective, logic-

Commented [Marie Lou51]: this is very nicely put, pointing to the directions of norms and behaviour invisibly shaped by design

Commented [Marie Lou52]: yes!

shifting and deeply productive way. I really find your book [What Can a Body Do? How We Meet the Built World is inspirational](#). Could you briefly introduce yourself and tell us something about your headspace and “take”?

SH: Thank you, Patrik! I’m a fellow traveler with these folks in doing some making and thinking over the last decade. I often say now that I’m a “humanist in tech” to account for my training in fine arts, history, and public/political design, all now brought to bear in my role as a professor at an engineering school. I spent some years facilitating collaborations in assistive tech—some practical, some more critical, as I say more about below—all of which was a way to embody the ideals and politics of disability studies *in the lab*. Disability studies is this incredibly rich tradition that’s been articulated by disabled people for decades, and broadly proceeded from the humanities. With the materialist turn and interest in design of recent years, there’s been more attention given to the material culture of disability: high- and low-tech making practices, the work of prosthetics in multiple biopolitical senses, the need for more basic participatory practices in design in both the academy and industry. It’s been so fun to be a small part of that.

These days I am much more a writer—trying to translate that scholarship into ideas that a much more general audience can hear and understand and embrace in their own daily lives. Public scholarship is probably most important to me right now, and a mix of reportage and analysis is what makes up my book: the result of a decade seeing people in so many contexts, reshaping and refashioning their material lives in profound ways. I am trying to write and design against the narratives that overwhelm disability experience in popular media: sentimentality and “inspiration porn,” tech saviorism, unidirectional design from “expert” to “user,” an excessive focus on *high tech as the only tech*.

PSV: Also, Sara, I wonder if you have any comments or questions (primarily to Matt and Marie Louise) in relation to the above conversation? I think you all have explored similar - but different - spaces and approaches trying to make critically-informed and logic-changing difference. But anyhow, the floor is yours!

SH: Hi everyone! What a terrific and substantial set of ideas is laid out here. Glad to join you—I’m an admirer of your work(s). There are so many notes I’ve made while reading; I’ve made some comments throughout the document, and I’ll address some other ideas in sections below.

— “**Seeing things differently**.” I thought you both treated the necessity of theoretical and pragmatic work so beautifully, and I want to underscore something MR said in this vein: that lots of folks can identify and critique the excessively instrumentalist logic of engineering, but fewer people admit the failings of, as you say, “didactic objectives which can also be a way of short-changing deeper critical and reflexive practice.” I think we all share a dissatisfaction with the didactic mode, especially when objects produce a purely “deconstructionist” narrative! I think often of Svetlana Boym’s distinguishing between estrangement in its classic, Brechtian sense—*here is this aesthetic object in which all the viewer’s operative norms are shattered, the end*—what she called “estrangement *from* the world” as opposed to “estrangement *for* the world.” This latter sense is the kind of estrangement, seeing things differently, that still returns us to the

Commented [Sha Xin W53]: hear hear! this applies generally to so much if not all justifications of “high” tech. I’ve been pointing out that digital algorithmic technologies are among the least refined and most primitive technologies we have. Compared to language, cooking and metallurgy.

Commented [Sha Xin W54]: Seeing-as ... Becoming-

Commented [Sha Xin W55]: thank you for this lovely thought from Boym

Commented [Matt Ratt56]: ditto!!!

Commented [Matt Ratt57]: fascinating connections to Haraway’s and others work with the need to remain connected to the work, despite the violence, the need to ‘not turn away’

broken world as it is, and to each other—another example of moving beyond the purely critical and toward possible alternatives, as MLJ mentioned. Just affirming here that the classical artistic strategies of [estrangement](#), [re-enchantment](#), [juxtaposition](#), etc still serve us when they can shed the didactic, ironic stance of in-group critique. And I want to enjoin humanists in the generosity that requires, as you both have said.

Commented [Sha Xin W58]: key

— “**Deconstructive vs constructive,**” + “**critique vs alternatives.**” These descriptions by both of you were terrific, and so attentive to the realities of collaboration and, yes, complicity that’s required if we want to traffic in each of these languages and modes of working. I wrote up my thoughts about the hiring of the new Media Lab director in the wake of Joi Ito’s departure, and ruminated there on [the need for dispositions of critique and repair](#) to live in the same, undivided house. I’ve got very practical suggestions there for, say, remodeling the Lab’s “Fellows” program to be more like “humanists in residence,” one way I’d suggest doing the capacity-building work you all call for. Now: I know plenty of folks who think the Media Lab’s model of corporate sponsorship is a failed experiment, full stop. But I write there about my own experience mentoring engineering undergrads and my understanding of why they seek out a Media Lab graduate education.

Commented [Sha Xin W59]: To the degree that we live in the era of algorithmic technologies, what are the techniques for constructive play with them? TML was one long-running social-material-institutional response with amalgams of computational media arts and experimental performing arts, critical studies and philosophy. <http://topologicalmedialab.net>

I am willing to be the reformist, incrementalist thinker in that piece—which makes me, yes, complicit, in the sense of [Not Satisfyingly Critical Enough](#)—because of a stubborn inner pragmatic streak. (Some of that impulse is my intellectual disposition, some personality traits, but above all a kind of urgency that’s come from raising a child with Down syndrome, who does need the most practical forms of access for his lifespan. He needs new narratives, new political structures, yes—and also hardware and software and services in the better-mousetrap form.)

Commented [Matt Ratt60]: "more critical than thou"

“An undivided house,” too, is the metaphor I used for my own lab, as a way of accounting for the fact that some of our collaborations in disability/assistive tech would be very on-the-ground, participatory design models. And some of our collaborations would result in critical design. You all and many other folks (Jeremijenko, Wodiczko, Wendy Jacob, Rick Lowe, Theaster Gates) have inspired me in this way—an insistence on a big, capacious canopy for working, wherein partnerships and projects proceed from a variety of rhetorical modes and where that shape-shifting can be a joyful, durational set of practices.

Commented [Matt Ratt61]: fabulous work, and, like some of Patrik’s initiatives, really about getting people together, raising table-stakes, infrastructure dev but where the infrastructure is relations and relationships.

— **A Relational Model for Working.** I’m also the PI for [Sketch Model](#) (MR knows about this!) at my home institution, Olin College, wherein we’ve been trying to do some of that capacity-building. We hosted counterpart thinker-makers the first summer of the grant period. Then we switched up the model in the second year to pair Olin-based professors, STEM folks or otherwise, with local New England-based artists, in [a week of open-ended collaboration](#). We hosted a big community dinner, did some lightweight “matchmaking,” offered stipends and some basic supplies with no strings attached. It was a way to invest in a relational model of change: the belief that when people genuinely like and respect each other, good work results. We had no deliverables attached to the stipends; we just had a simple application process and asked for updates. We took a “high risk, high reward” stance toward the investment (even though the risk was in fact low!)—our funder supported experimentation, so we took them up on it. And out of

Commented [Sha Xin W62]: a week is quite short, in my experience setting up organizational conditions for deeper and, transformative collaborations. [_Transdisciplinary_ work](#) can be more than “collaboration”, and is characterized, enabled by: (1) pursuing internally coherent streams of inquiry / making that is open-ended, yes, but at any moment and characterized by a clear -- albeit not always verbalizable -- aspiration; (2) inquiry that autonomously demands crossing multiple disciplines; (3) nontrivial and thick intersection with each transected discipline, yielding non-trivial contributions -- whether it be publication in journal of record or performance or a new technological process or philosophical or critical insight; (4) participants engage in growing relationships that, repeated over multiple projects, lead each participant to [_change_ his | her own disciplinary practice](#).

See Topological Media Lab (2001-2013), in the analysis and reflection : https://www.academia.edu/1537746/The_Atelier_Lab_as_a_Transversal_Machine

Since 2012, we implemented this in forming the School of Arts, Media + Engineering: http://topologicalmedialab.net/xinwei/papers/slides/ame_transdisciplinary

10 funded pairings, 8 really flourished far beyond what we'd hoped: new curricula, new research, new public art and fine art partnerships that grew from that small initial open investment. We learned that you can circumvent the common pitfalls—like the “sensitivity” you reference above—that arise between STEM and humanities when you: 1) have a big convivial meal(!) with all that symbolically conveys, and 2) invest in relationships, generosity, and the structures that we know set up Deci et al's intrinsic motivation: autonomy, competency, relatedness.

PSV: Thank you so much, Sara! Your comments/perspectives/cuts add so richly to the discussion, both in terms of commenting/reflecting on what has been said and brought up, and in giving us more/alternative tools, models and pointers to use when approaching the issues at stake here. It is also very meaningful to hear about your own position and personal motivation. There is an important aggregate direction here (a kind of arena) that resonates with the earlier dialogue between Matt and Marie Louise (and Nicole's comments) and also my own thinking (and I may come back to this as we wrap things up).

I will now invite Matt and Marie Louise to make additional comments or notes in relation to the input from the visiting conversationalists/interventionists (Sara, Nicole and Xin Wei).

MR: What a wonderful convo and set of perspectives, experiences, and insights. I'm doing some writing right now with my friend Steve Jackson who some of you may know from his work on 'repair.' We are thinking through the idea of 'hope', specifically within the domain of 'human-computer-interaction' (an aside, HCI has proven to be an important contact zone for critical STS scholars, designers, engineering, and computer science.) Our starting point for this work is Miyazaki's book 'A Method of Hope' which is proving very evocative. Lots to do with this, (how to distinguish hope from optimism, is hope reconcilable with a lack of faith, how is hope sustained through incomplete progress towards one's goals, etc.) but for me, the main thing is to look for, within critical work, practices, performances, techniques that are generative of hope. I am pretty sure you all are paramours of hope, despite the often illicit nature of hope within each of our related communities. But I believe hope is really necessary right now. As Rosi Braidotti puts it, 'Despair is not a project. Affirmation is.'

MLJ: Thank you so much, Sara, Nicole and Xin Wei. I learn so much from your work and I feel very privileged to engage in this conversation with you and the opportunity for us to share and relate our work and thinking. To follow up on Matt's comment, processes that are generative of hope is indeed something that really resonates with me, and has grown closer to me the last 1.5-2 years of accumulating crisis. Particularly with feminist and climate activists, within and outside HCI community, I have had countless conversations about how the critical work we are doing can or must inspire hope, why that is, and how we do it. Not that that is easy, because these times are troubling in many ways, and differently for different people, but in our at times dark conversations, we have returned to aspirations of hope. I think hope also relates with what Sara is saying about generosity and joyful practices, about returning to the broken world and turning to each other, and about the simple ritual of sharing a meal. I honestly believe that these joyful practices and the flow of energy that arise from those relations is what inspires hope and

allows us to see things differently. Not only critique but excessive joy, generosity and care is what moves us to live/research/make in vibrant ways. And I see this also in the events that Patrik has been facilitating, in which the social, sometimes neglected or invisible infrastructures, are what moves events into catalysts of change. It is like a strong stubborn insistence that things can be different and better, and such an insistence has proved to be a collective act. As also demonstrated in this conversation of endless comments, questions and relations, that are furthering our thinking and have inspired me a lot.

3D-printing, as its very name announces, ferociously implements what Barad memorably observed: "Language has been granted too much power. The linguistic turn, the semiotic turn, the interpretative turn, the cultural turn: it seems that at every turn lately every 'thing' — even materiality — is turned into a matter of language or some other form of cultural representation. The ubiquitous puns on "matter" do not, alas, mark a rethinking of the key concepts (materiality and signification) and the relationship between them. Rather, they seem to be symptomatic of the extent to which matters of 'fact' (so to speak) have been replaced with matters of signification (no scare quotes here). Language matters. Discourse matters. Culture matters. There is an important sense in which the only thing that doesn't seem to matter anymore is matter."