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Collectively Reimagining Technology

By Kirsti Reitan Andersen, Majken Overgaard, Mirabelle Jones, and Irena Shklovski

Abstract

This article explores the use of participatory art and technology workshops as an approach to create more diverse and inclusive modes of engagement in the design of digital technologies. Taking the starting point in diverse works of science fiction, we draw on the concept of critical making and Ursula Le Guin's disdain for the distinction between hard and soft technology to discuss the role of collaborative reimagining in the creation of technological futures. Such an approach facilitates a nuanced and reflected understanding for how technologies come to be designed and can empower more open and diverse participation in technology development.

Keywords: Critical making; Science fiction; Diversity; Technology; Collective.

1. Introduction

Science fiction is becoming increasingly popular as a tool to speculate and envision futures; we can speculate about different scenarios and reflect on how our current behavior will impact the future (Kohno and Johnson, 2011, Burton et al., 2018; Kong et al., 2021; Linehan et al., 2014). The genre is a frequent source of inspiration for innovation by designers, artists, engineers and inventors. Though it is a difficult ground to mine for plausible near-futures, science fiction offers a rich terrain to explore in artistic and critical technology projects. For example, Art + Com Studios' Terravision is "... an isochronous realisation of Neal Stephenson's literary idea in the novel 'Snow Crash' as well as a prequel to Google Earth" (Art + Com Studios, n.d.). Another example is SymbioticA's Tissue, Culture & Art Project (TC&A) installation "Disembodied Cuisine", which was shown at an international, biological art exhibition in 2003 (TCA, n.d.). NASA later requested to patent the tissue culturing protocol that TCA developed for this installation (Catts and Zurr, 2004-2005). Such translations, from science fiction and critical and artistic explorations, can lead to concrete visions of near futures that can become innovations.

Taking our departure from the American writer Ursula Le Guin's "A Rant About 'Technology'" (2004), where Le Guin argues against the classical distinction between hard and soft science fiction, this paper explores the relationship between humans, technology, and the potential role of science fiction in reimagining our technological futures and who gets to create it. Le Guin reminds us that 'technology' and 'hi tech' are not synonymous and that a technology that is not 'hi' is not necessarily 'low' (2004). We apply Le Guin's thoughts to suggest a new understanding of technology that is not hierarchical, to make room for a multitude of approaches to technological innovation. Our analysis and discussion are based on our experiences with developing and running the Digital Alchemy Workshop Series, a series of four online workshops that took science fiction and/or speculative fiction as a starting point and deployed critical making (Ratto, 2011) and participatory speculation as methodologies (Frauenberger, 2019; Shklovski and Grönvall, 2020).

Two decades into the new millennium it is hard to imagine a future in which digital technologies do not play a key role. Acknowledging the many opportunities brought about by these technologies, its wide-ranging impacts on individuals and societies are also increasingly the topic of heated debate (Gingrich et al., 2020) and criticism on account of their lack of inclusivity and diversity. Although such 'limitations' in our creation of technologies are not necessarily a result of evil will or conscious exclusion, but rather mirror existing cultural hierarchies and bias, it is fair to say that these represent a certain narrowmindedness and lack of ambition in our imagination and creation of technologies. We argue that using diverse works of science fiction and critical making as starting points for collectively reimagining technologies can help us speak to and reflect upon the current state of technologies, facilitating more inclusive and diverse processes of technology creation as a result.

2. The Making of Digital Alchemy

Science fiction has been touted as an inspiration for HCI research (Mubin et al. 2016) and used as a basis for workshops in experiential entanglement (Kong et. al 2021), prototyping and narrative scenarios (Burnam-Fink, 2015), to explore the relationship between sci-fi and HCI (Mubin et al., 2016), and even to invent alternate endings to HCI papers (Linehan et al., 2014). Though not new as a source of workshop material, the Digital Alchemy Workshop Series differed from previous workshops due to an emphasis on *diverse* works of science fiction, going beyond the traditional North American and European canon (Okorafor, 2017), our desire to delete traditional tech hierarchies and a focus on the joint processes of critical making and participatory speculation.

Critical making according to Ratto “emphasizes the shared acts of making rather than the evocative object... They [the objects] are considered a means to an end, and achieve value through the act of shared construction, joint conversation, and reflection” (Ratto, 2011). Thus, as opposed to workshops where a final product is emphasized as the goal of the endeavor, the digital alchemy workshop series stressed the importance of the creation process itself. This was emphasized through introductions of techniques, repeated assertions that it was alright to make mistakes and encouragement to the participants regarding experimentation. This intention of emphasizing the process not the product was in keeping with the workshops’ additional focus on participatory speculation. Frauenberger argues that it is critical to create “spaces and processes that enable humans and non-humans to come together in the creative, political, controversial Participatory Speculation and mattering of future socio-technical configurations” (Frauenberger, 2019, p. 19). The workshops took this collective “... mattering of future socio-technical configurations” as a starting point for developing insights into science fiction concepts using present day materials (Frauenberger, 2019, p. 19).

Thus, using Le Guin’s ideas of collective expedition, presented in her short story *Sur* (1985) and critical making as starting points, with this paper we investigate the intent of creating an inclusive joint journey, where participants and their experiences can become an indelible part of critical knowledge production and the creation of technologies. We propose that such an approach may create a foundation for a new methodology that invites and facilitates a multiplicity of skills and voices in critical discussions about and the creation of technologies — making the process more transparent, inclusive, and diverse.

3. The Workshop as Collective Expedition

The design of the workshops and our interest in the potential value of a collective learning process was inspired by the short story *Sur* by Le Guin (1985). In this short story Le Guin describes an expedition to the South Pole by a group of women from South America. It was our ambition to establish an informal learning environment that resembled the scientific expedition described in *Sur*, where the women’s journey is motivated by the longing for the South Pole. In this fictive expedition, the women set out not to break scientific ground but to observe and discover, to travel and see. Given the possibilities for women at the time the short story takes place, none of them had any formal education and therefore no possibility to officially add to the scientific knowledge about the South Pole. Instead, it became the act of travelling and observing that was essential for the women; to build knowledge for oneself and collectively travel as part of the expedition. This inspired us in the construction of the workshop, shifting from the classical approach to knowledge transfer towards facilitation conversations that could constitute the reimagining of what we want future technology to be.

Our goal was to put the privilege of imagining new technologies into the hands and minds of the participants.

In the design of the workshop format, Le Guin's short story supplements Ratto's ideas of critical making by speaking to the additional value of non-hierarchical structures in exploration and knowledge creation. The women in the story are "by birth and upbringing unequivocally and irrevocably, all crew" (Le Guin, 1985, p. 2012) they are all equal, rely on collective decision-making and are thus able to reach the south pole through a collective effort.

Thus, we sought to create a learning environment where the participants have the possibility to actively engage with each and the workshop content, eventually becoming "crew" in a collective exploration of possible technological futures.

We held four online workshops that lasted between 2-3 hours each in February and March 2021. All workshops took their starting point in science fiction written by a diverse body of authors including women, LGBTQQAI* folk, and people of color. According to Leah Zaidi "science fiction empowers marginalized voices, fosters equal representation, and challenges entrenched orthodoxies and concepts of 'the other'" (2019). Combining this approach with a focus on process rather than product (Ratto, 2011), we borrowed the worldbuilding created in these narratives to inspire workshop participants to imagine a future world, where diverse voices are creating the technologies, we might use and the futures we may live in.

Through the workshops we relied on skill-building as a method to be able to understand and work with, for example, a microcontroller. However, the conversations about how to understand and perceive the technology being used in each of the four workshops were considered equally important (Ratto, 2011). By emphasizing the dialogue and the joint discussions we proposed technological futures where the distinction between "hard" and "soft" could be dissolved and where speculation about technological futures could help inform the way we negotiate our present through learning technical skills and interpreting their potential.

4. Collectively Reimagining Technology

With a focus towards 'hi tech', we often speak about "the black box of technologies" (Stahl, 1995). To many, the ways in which technologies are created and operate are mysterious and maybe even considered magical. While there is a tendency to think about technologies as inherently complex and modern (such as the digitalized technologies of the last twenty years), Le Guin reminds us that technology is not only 'hi tech'. Rather, technology is "... the active human interface with the material world" (2004). Thus, all manmade objects including knives, paper, linen, and aspirin pills are forms

of technology, each requiring a set of specific skills to produce. Le Guin continues: “I don't know how to build and power a refrigerator, or program a computer, but I don't know how to make a fishhook or a pair of shoes, either. I could learn. We all can learn. That's the neat thing about technologies. They're what we can learn to do.” (2004).

Thus, Le Guin (2004) reminds us that humankind has created technologies for thousands of years; she reminds us that technology development is deeply ingrained within our cultures; she reminds us that all technology development depends on certain skills and knowledge; and she reminds us that we can all learn and take part in this development.

The Digital Alchemy Workshop Series attempted to unpack and reopen some of these same questions, revealing some of the biases of our material structures and setting the ground for a collective reimagining of technologies. Speaking to some of the workshop participants a few weeks after their participation in one or more of the four online workshops we found that we were successful at least to some extent in our ambition to encourage more nuanced reflections about the development and use of digital technologies. The workshops generally moved the discussions beyond issues of addiction to SoMe and data collection to include fundamental questions of socio-technical systems such as what is technology and how its use might result in exclusion or inclusion, and for whom and by whom is technology created? The participants generally reported that they signed up for the workshops to learn (more about) a specific skill or tool, but what seems to have stuck with them afterwards were the science fiction inspired conversations and processes facilitated by the artist-moderators. In this way our use of science fiction written by a diverse body of authors proved useful in initiating critical reflections on the opacity and biases of current technologies. Drawing on this specific literature, as opposed to the usual North American or European science fiction canon that tends to inspire much current technology thinking and imagination, gave room for an array of different worldviews and worldbuilding scenarios and initiated questions of hierarchies in technology creation and use.

While at times causing some frustration amongst participants who were eager to make or learn something, such as how to use advanced sound editing software or write code, the workshops' focus on process rather than product supported the collective reimagination of technology, making room for asking different sets of questions and playing or experimenting with technologies. At the same time, we felt that little or no sense of collectivity or crew was established for most of our workshop participants. Generally, participants came to the workshop expecting that someone would take the lead and that they would be taught a skill without needing to put themselves out there through dialogue and reflection. Speaking to participants following the workshops, it was clear that they were challenged by our attempt to level the playing field and to invite everyone to contribute to the conversation, either feeling that they knew too much or too little. Participation and giving yourself voice among strangers can be a daunting experience after all. Collectivity, of course, is more than

merely seeing others as available to be with in the future. Collectivity also resides in finding ourselves changed through our interactions with others.

5. Discussion

The standard ways in which technologies are made, can result in systems and technologies that lack cultural richness, emotion, and people- (and planet) oriented values (Hertz, 2015). Thus, engineers and developers often end up creating products and services that prioritize principles like efficiency and productivity that contributes to a consumer culture "... that overworks, overproduces, and overconsumes." (Hertz, n.d.). What Le Guin's "Rant about Technology" and Ratto's (2011) critical making reminds us, is that such problematic approaches to technology creation are not necessarily or always on purpose, but rather a demonstration that technology creation is deeply embedded in our socio-technical systems.

All built technology embodies cultural values (Hertz, 2015; Dunne and Raby, n.d.; Ratto, 2011). Thus, the opacity of technologies is not only a question of a lack of transparency in technology creation, but perhaps a question of a lack of transparency in our socio-technological systems at large. Adopting methods of critical making, we propose to further encourage critical reflections by introducing conversations inspired by a diverse body of science fiction authors including women, LGBTQQAI* folx, and people of color. In this way our focus remains on the process (Ratto, 2011), trying to expand and support the collective reimagination of technologies through an array of different, diverse, and inclusive worldviews.

While Ratto (2011) highlights the importance of the process, to the extent that he in a talk at the Service Design Global Conference 2019 proudly announces that he has no pictures of prototypes or products developed during his workshops (SDGC, 2019), Hertz (n.d.) argues in favor of a focus on both process and interactive prototypes, seeing both as potential tools in the creation of more culturally relevant, socially engaged, and personalized technologies. To Hertz, a sole focus on process limits the experience to workshop participants, whereas interactive prototypes can "operate as a type of boundary negotiating artifact or boundary object – objects that coordinate the perspectives of diverse communities of practice (n.d.). Agreeing with Hertz on the potential powerful role of objects "... beyond the process of making" (2015, p. 4), our primary aim with the Digital Alchemy workshop series was to explore methods that could potentially facilitate a collective criticality, which in turn sets the ground for the making of critical and meaningful practices and objects.

In her short story "Sur," Le Guin tells a story about an exhibition to the South Pole, a place unknown to most people and a place without law. Our respondents tell a story about a similar

place, namely the internet. One participant talks about the internet as “the wild west” - a lawless place that is both slightly frightening and full of opportunities. Le Guin’s expedition to the South Pole in our case became an expedition to the internet and the technologies that surround and shape our interconnected world.

Yet this non-hierarchical structure was challenging to establish throughout the online workshop formats, and it is questionable whether we succeeded in creating an environment where we were “all crew” (Le Guin, 1985) as described above. Through the analysis of the interviews with the participants it became clear that even though we attempted to embed an expectation of these conversations in the workshop invitations, the reference to skill-building may have led participants to expect a classical teacher-student environment of knowledge transfer, rather than being active co-producers of knowledge in an open-ended joint expedition.

The questions of pre-existing skills and skill-building loomed large in the workshops. While some of the participants had the feeling of knowing too little, others had the feeling of knowing too much. In both cases such feelings ended up stifling participation. This made it much more difficult to create conditions for a non-hierarchical dialogue. Both experienced participants and beginners held back. The latter because they didn’t feel they had any valuable information to add and the former because they wanted to provide space for others to learn. This begs the question of how much knowledge is necessary to feel legitimacy in partaking in discussions? What role does skill building process have in helping people become part of a collective? These are questions of workshop design and of the intrinsic ways all of us can simultaneously feel the presence and lack of expertise when we encounter different kinds of technology. Nevertheless, the participants’ idea of hard/soft technology and thereby also their own skills were challenged. We saw a recognition of the need for dialogue around technology and what it is perceived to be. We find that technology capabilities and expectations need to be negotiated as part of intentional workshop design to achieve greater impact.

6. Conclusion

Technologies we use in our everyday lives are supposed to improve our lives and make things more convenient and yet every so often, what the technology wants and what we want, diverge quite a lot. Every so often, we get frustrated and wonder who thought this was the right way of doing things? Someone somewhere made design decisions and consigned the rest of us to shoehorn ourselves and our practices into the narrow ways of how technology imagines things ought to be. How might we change this?

Our purpose with this paper was to suggest a critical technology exploration workshop format that draws on a diverse body of science fiction and critical making to develop new and more inclusive strategies for the development of our technological futures.

We used skill-building as a method and invited the participants to a conversation about how to understand and perceive technology. The experimental nature of the workshops was intended to build a non-hierarchical place for workshops participants to learn collectively, because we believe the act of collective reimagination is essential in creating more diverse technological futures. In this way we sought to bring people together as crew to collectively imagine a plurality of worlds or what the Zapatistas call the pluriverse - a world in which many worlds fit (Escobar, 2018).

We suggest that a diverse and inclusive science fiction inspired critical making methodology has the possibility to push our thinking beyond the limitations of current socio-technological systems to create more open, diverse, and inclusive technological futures. We also acknowledge the shortcomings and challenges of pursuing such a format. In traditional workshops, it is common for participants to approach with expectations about learning outcomes and formats. While we envisioned a collective workshop environment, ultimately, we found that participants found this format challenging when it came to practicalities such as whether / when / and how to participate in the teaching process. Further research could be done in examining how participants might be further directed or encouraged to participate in the knowledge making and sharing of such a workshop. We did find we were successful in creating lasting impressions and considerations about technologies through centering our discussion and making practices around diverse works of science fiction. These works provided a basis for considerations of alternative and inclusive futures.

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