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Special Issue on Hybrid Pedagogies, (special issue Digital Creativity)

Editorial:

An increasing awareness of the potential biases and problematic impacts of digital technologies is driving a renewed focus on social responsibility and ethical considerations within the fields of engineering and the computer and data sciences. Similarly, a renewed sense of complicity in our socio-technical environments has encouraged scholars from a range of design, humanities, and social science disciplines to engage more directly in public-facing work, often through prototyping, exhibitions, and hands-on educational activities. However, practical and epistemic difficulties continue to impact our capacities to bridge social and technical orientations and to design pedagogical activities that are responsive to these entanglements. The so-called 'great divide' as described by Bowker, Star, Turner, and Gasser remains as challenging today as when they engaged with similar issues in the late 90's. Yes, significant progress has been made in the ways we theorise about the tensions (Latour 1999; Stengers 2000) and indeed in how we might approach them productively (Benjamin 2019; Parreñas 2018; Pérez-Bustos 2017; Puig de la Bellacasa 2017). The rub, however, surfaces in how we put these ideas into practice and, pertinent here, how we build hybrid pedagogies that are able to work at the messy but nevertheless generative intersections.

This special issue on hybrid pedagogies contributes to this developing and ongoing conversation in a resolutely interdisciplinary way. It includes articles by scholars within the fields of computer science (CS), engineering, critical race studies, postcolonial, queer, feminist, and learning theory, arts, architecture, STS, and others. The contributions offer alternative starting places to explore the themes of hybrid pedagogy and include auto-ethnographic accounts of teaching and mentorship, descriptions and analyses of organizational efforts and curriculum development, the positioning of design and engineering in wider sites of world-building, methodological inventions on the cusp of the social and technical disciplines, as well as pedagogical interventions that amplify under-recognized legacies of data science or technology development.

Contributions

In "A "'Speculative Pasts' Pedagogy: Where Speculative Design Meets Historical Thinking", Tega Braine and Laine Nooney introduce a technique the authors call "speculative pasts" where students revisit and retell a conventional or dominant historical account around/with technology development. With this technique, students ultimately create and present an artifact that does this historical retelling. The authors describe not only a subset of the artifacts produced but also the structure of the course and the ideas that informed it. The article represents a strong articulation of a new pedagogical method. Beyond the particulars of their case study, the method promises to enliven new and important connections between humanistic (specifically historical) and pragmatic (specifically designerly and technological) ways of working.

Similarly, in "Analyzing Public Interventions through the Lens of Experimentalism: The Case of the Museum of Random Memory", Annette Markham and Gabriel Pereira provide an analysis of their ambitious Museum of Random Memory (MoRM) project, a series of material and

conceptual interventions that prompt members of different publics to reflect on the digitization (or "datafication") of memory. Taking the form of an exhibition and performance, these interventions serve to spark conversation and debate about continuous transformations around personal data. Their article aims not just to introduce the MoRM project, but more importantly to unpack the conceptual orientation that inspired their performance of everyday digital media engagements, a framework they refer to as "experimentation." Focused on informal learning and 'lay audiences', the multiple techniques they describe in this article will be useful to both researchers and educators interested in digital and data literacy.

"Cultivating Critical Imaginations: Post-disciplinary Pedagogy in a Computational Design Laboratory" also explores the intersection of pedagogy and techniques. Daniel Cardoso Llach and Mine Özkar present a case study of a highly successful and innovative post-disciplinary, computational design program, consisting of research seminars and studios. They engage readers in a rich description of how the university program functions by using four compelling examples from student work. These examples help to shed light on the hybrid pedagogical approaches of material and socio-technical, creative and critical exploration. The material presented is both detailed and specific, and provides examples of the themes and tensions entailed in working across disciplinary and epistemic boundaries.

The fourth article in this special issue turns from specific pedagogy to more general themes. "What Design Education Tells Us About Design Theory: A Pedagogical Genealogy" explores key themes within education that link technical practices to more conceptual work. Using an historical approach, Malileh Ghajargar and Jeffrey Bardzell explore how design education navigates a complex path between technical rationality and more pragmatic/phenomenological perspectives and processes. This intervention offers an interesting framing for thinking about hybridities and specifically what it means to take seriously pedagogies that afford or necessitate a pragmatic synthesis of these approaches. The authors highlight design and its history as a particularly valid site for entangling rationality with phenomenological approaches. With this hybridity, they suggest that educators from adjacent areas, such as STS, media studies, digital humanities and the like might meaningfully use design and its history as a lens for thinking through similar entanglements within their own fields.

The fifth contribution to this special issue presents a compelling argument for considering the complexities of (infra)structural inequalities in pedagogy and pedagogical hybridities. In "Infrastructures of Abstraction: How Computer Science Education Produces Anti-Political Subjects", James Malazita and Korryn Resetar move through the complexities and recognize the always emergent tensions at play by introducing the reader to a critically orientated perspective/syllabus in Computer Science (CS) education. Specifically, they employ the common trope in computer science, *abstraction*, to show how programming practices come with particular epistemic cultures and political potentials. However, at the same time the application of abstraction allows these 'social' concerns to be legitimately bracketed off and placed out of bounds. Rather than reaffirming them as separate from or inert in CS programming and design, Malazita and Resetar put forward a radically alternative curriculum that places identity, power structures and epistemics centre stage and integral to students learning to program.

In "Doing Thinking: Revisiting Computing With Artistic Research and Technofeminism", Lorren Britton, Goda Klumbyte, and Claude Draude address similar themes and tensions but

from a very different disciplinary context. In this article two methodologies often considered as non-complementary, namely that of artistic research and of computing, are brought in conversation. Through their collaborative research project "Reconfiguring Computing through Cyberfeminism and New Materialism (CF+)", the authors aim to refigure the dominant epistemologies and practices of CS and electrical engineering by introducing unconventional technofeminist and speculative material concepts. Drawing on a more open-ended and experimental culture as frequently experienced in artistic practice and research, the hybrid methodologies offer a greater attentiveness to the hierarchies informing the traditions and practices of computing and beyond.

We end with "Navigating Equity Work in Engineering: Contradicting Messages Encountered by Minority Faculty." Here, Diana Chen and Alex Mejia offer a timely critique of the challenges minority engineering faculty face while teaching within an engineering program. Rather than provide a simplistic critique of existing practices, the authors aim to highlight contradictions experienced in the classroom based on their firsthand experiences. The article addresses critically and in detail the structural activities required to reform engineering education that are being undertaken by junior faculty, women faculty, and faculty of color. Informed by feminist, postcolonial, and engineering education theory the paper addresses such issues as the ongoing power of "white male" stereotypes, hegemonic norms, and microaggressions prevailing in engineering culture, and the need to develop cultural norms based on diversity and social justice that are substantially backed up by auto-ethnographic reflections.

Read together, this collection of articles shows that sites of pedagogy—and the spaces, people and practices that constitute these sites—are potent assemblages for making a difference in technoscientific ways of being. That making a difference is necessary is made obvious in increasingly impactful events where the lack of attention to the complex linkages between technical systems and social life is manifested. Whether through image tagging algorithms that label photos of black people as gorillas, social media platforms that simplify practices of political manipulation, or racially-biased AI systems in policing and in healthcare, it is clear that we need new ways to reflect, teach, learn, and make. Through cases, examples, and close readings, the articles teach us that myriad worlds awake from educational experiment, from testing and reworking the hybridities so that more is able to happen**.** What though is this more? From the cases and stories that follow, are there ways to think with hybrid pedagogies, altogether, that enlarge and thread across the woven knots we clumsily divide into the social and technological? And what might such rethreadings tell us?

In a recent article in Wired Magazine, Lily Irani and Rumman Chowdhury (2019) critique the technology sector's ignorance of long-standing fields - such as STS - that provide tools for better parsing the complex nature of socio-technical systems. Instead of encouraging students in computing related fields to cross-train in the social sciences and the humanities, the authors note the ways new fields are proposed. In particular, they criticize Tristan Harris' proposal to create a new field of 'Society & Technology Interaction" intended to address engineer's lack of social and cultural knowledge. Seeing such a move as a colonizing of valuable but often under-represented scholarship, Irani and Chowdhury encourage the tech sector to be more respectful of multiple forms of experiential expertise and to "learn from history and the contributions of

others." While sympathizing with Harris' intent, we agree, and see this special issue as a way of modelling what such respect and learning might entail.

Something that is recognized in all the special issue contributors is the necessary investment in a continuous project of working across worlds and staying with the tensions and "troubles" that arise. (Haraway 2016). Joe Dumit, in his own previous pedagogical engagement (2014), links Haraway and Deleuze in the main problem we face in addressing the complexity of the world. It is hard, he notes, to not 'turn away' from the troubles, from the violence. It is easier to step back and away. Yet, as Dumit writes, "Non-innocence and complicity are necessary if one is to confront world histories as histories that one is a part of and accountable to." We agree and indeed, we learn it is finding and working through the sources of trouble that demands our attention in pedagogical practices. What we might take away from this then is that hybridities are more than bringing things together, they involve efforts to resist practices that close down, bracket off, and let things be.

Building up a hybrid pedagogy includes the making of space that allows us to be *un*bounded by our relations and rapport with things (Taylor 2017; Devendorf and Rosner 2017) while remaining tied to these things and complicit with them (Ratto, 2017). To do hybridity is to be willing and open to what the entanglements invite, and at the same time to continue to be responsive and responsible for the worlds-in-the-making. To be pedagogical in this vein is to hold open this invitation with others, and to be ready with them for what might come.

REFERENCES

Benjamin, Ruha, ed. Captivating Technology: Race, Carceral Technoscience, and Liberatory Imagination in Everyday Life. Duke University Press, 2019.
Bowker, G., Star, S. L., Gasser, L., & Turner, W. (Eds.). (1997). Social Science, Technical Systems, and Cooperative Work: Beyond the Great Divide (1 edition). Mahwah, N.J: Psychology Press.
Devendorf, Laura, and Daniela K. Rosner. "Beyond hybrids: Metaphors and margins in design." In Proceedings of the 2017 Conference on Designing Interactive Systems, pp. 995-1000. ACM, 2017.
Dumit, J. (2014). Writing the Implosion: Teaching the World One Thing at a Time. Cultural Anthropology, 29(2), 344–362.
Irani, Lilly, Chowdhury, Rumman. (2019). To Really "Disrupt," Tech Needs to Listen to Actual Researchers. Wired. Retrieved from https://www.wired.com/story/tech-needs-to-listen-to-actual-researchers/
Latour, Bruno. *Pandora's Hope: Essays on the Reality of Science Studies*. Harvard university press, 1999.
Haraway, Donna J. Staying with the trouble: Making kin in the Chthulucene. Duke University Press, 2016.
Parreñas, Juno Salazar. Decolonizing extinction: The work of care in orangutan rehabilitation. Duke University Press, 2018.
Pérez-Bustos, Tania. "Thinking with Care: Unraveling and mending in an ethnography of craft embroidery and technology". *Revue d'Anthropologie des Connaissances* 11,1 (2017):a

Published: Ratto, Matt, Daniela Rosner, Yana Boeva, and Alex Taylor. "Special issue on hybrid pedagogies editorial." *DIgital Creativity* (2019): 213-217.

Puig de La Bellacasa, María. Matters of Care: Speculative Ethics in More Than Human Worlds. Minnesota Press, 2017.
Ratto, M. (2016) Making at the end of nature. *Interactions*, Volume 23 Issue 5, September + October 2016, Pages 26-35,
Stengers, Isabelle. *The Invention of Modern Science*. Minnesota Press, 2000.
Taylor, Alex S. "What lines, rats, and sheep can tell us." *Design Issues* 33.3 (2017): 25-36.