How Could AI Supply Chain Research Shape HCI Inquiries And Vice-Versa?

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Abstract

HCI research on AI has largely focused on end-user interactions or the practices of developers working to improve system performance. This meetup proposes to broaden that scope of interaction to encompass the material, political, and economic dynamics that shape AI across its lifecycle. Drawing on STS, we recognize AI as the outcome of extended supply chains involving practitioners, organizations, infrastructures, and governance, all entangled with power asymmetries and economic incentives. Much of this supply chain remains invisible within HCI, yet it profoundly influences how AI systems are designed, deployed, and experienced. The meetup will bring together HCI scholars to explore how supply chain perspectives can enrich HCI research. We plan to gather researchers of the HCI community and beyond, in order to discuss how they could integrate the AI supply chain in their research and what would be the implications, and how HCI can further contribute to supply chain studies.

CCS Concepts

• **Human-centered computing**; • **Social and professional topics → Computing / technology policy**; • **Computing methodologies → Artificial intelligence**; • **Applied computing → Law, social and behavioral sciences**;

Keywords

AI, Supply Chain, Value Chain, Research Agenda, AI Lifecycle, Infrastructure, Sociotechnical Systems

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1 Motivation and goal for the meetup

Research in HCI has often conceptualized artificial intelligence (AI) through the lens of human–AI interaction. For instance, HCI scholars have worked on the design of interfaces that allow end-users to interact with AI systems appropriately, and conducted research on the impact that these interactions have on end-users [1, 17, 23]. Additionally, HCI scholars have started to examine the AI lifecycle [13] with, e.g., discussions of stakeholder inclusion across design and evaluation [11], and infrastructural studies on the human and computational resources that underpin AI systems [15, 24]. Resonating with critical AI studies and STS, which conceptualize AI as an assemblage spanning data, models, compute, infrastructures, labor, and governance [2, 9, 20], this work underscores that such AI supply chains are not neutral backdrops but active forces shaping practices and interactions [14, 16].

Objectives of the meetup. This meetup seeks to start consolidating and expanding such a new lens on AI systems, and explore the many research opportunities that remain. We aim to foster a discussion that will expand the scope of what constitutes an "interaction" with an AI system to include the material, political, and economic interactions that exist throughout the system lifecycle and are essential for the system's development and operation. Beyond advancing this research, the goal of this meetup is to initiate a community and bring together HCI researchers interested in AI infrastructures, materiality, and political economy to foster connections across subfields. In doing so, the meet-up will appeal to researchers of AI supply chains, pipelines, and value chains; those working in responsible AI, governance, and participatory design; sub-communities focused on contestability, infrastructural perspectives, and domain-specific AI applications; and scholars building on STS and CSCW traditions. In conclusion, we see the session as both a networking opportunity and a facilitated discussion to collectively imagine how HCI can better engage with AI supply chains.

Examples of the ways in which the supply chain perspective interacts with HCI research. We now provide examples of research pathways that could be discussed during the meetup as they expose synergies between HCI research and research on AI supply chains.

First, the supply chain perspective invites us to revise our understanding of the interactions between the end-users and the AI

systems. Rather than focusing only on the interactions between the end-users and the AI systems that is produced by the supply chain, this perspective invites HCI researchers to unpack how end-user experiences are also shaped by the infrastructural dependencies and procedural activities happening within the supply chain. For instance, although the *deployment* of the AI systems is often seen as a mere engineering challenge, application-specific literature shows that it can also be a source of harm for the end-users interacting with the AI systems. E.g., deploying computer-vision-based AI systems in farms creates economic dependencies between the farmers (end-users) and the AI providers (developers) who have to continuously pay a subscription for the material infrastructure (e.g., cameras in barns) to be maintained –maintenance being a procedural aspect of the supply chains– [7], and it might also diminish the welfare of the farmed animals whose barns have to be restructured to let such material infrastructure in [10]. From a supply-chain perspective, these consequences of interacting with AI are not "side effects", but integral parts of the human–AI interaction: the farmer's experience is mediated as much by subscription contracts, infrastructure maintenance, and the welfare of animals, as by the interface with the AI system.

Second, the supply chain perspective invites us to reframe the HCI works that have analyzed the interactions between the AI developers and AI systems [5, 12]. On the one hand, this perspective invites us to consider more comprehensively the complex social and political interactions that unfold across layers of policy, compute allocation, and/or system design. This enables interrogation about how infrastructures, policy frameworks, and social factors interact to create AI systems. On the other hand, this perspective highlights the lack of studies on the ways AI developers further engineer the material infrastructures underlying AI systems and impact governance layers.

Third, the supply chain perspective opens up new research questions that HCI scholars are well-placed to tackle. The growing debate on AI sovereignty often framed at the national level, exemplifies this trend [18, 19, 21]. While sovereignty has been extensively analyzed in AI policy as part of supply chain concerns, it remains still underexplored in HCI. Engaging with it offers HCI researchers an opportunity to investigate how sovereignty is imagined, enacted, and contested in specific practices and contexts. This line of inquiry resonates with prior HCI work on how collective visions of technology are translated and materialized in development practice and extends it to the AI development contexts. Questions of why sovereignty is pursued, by whom, which aspects of AI are subject to sovereign claims, and how such claims are enacted reveal sovereignty as an ongoing negotiation between autonomy, interdependence, and competing values. For HCI, this opens pathways to examine how sovereignty discourses shape sociotechnical practices across technical, organizational, and political layers. Crucially, these inquiries can inform how AI applications are developed and how interactions are designed for end users. For example, co-design, participatory, and speculative methods could be mobilized to surface community values that guide not only system-level decisions but also the design of concrete interaction mechanisms, interfaces, and practices of control.

2 Structure of the meetup sessions

We envision the meetup to be organized around three discussions, to kick start our workstream on AI supply chains. These discussions would happen both in small groups and with all the participants together, in order to facilitate multiple modes of participation. Discussion (1) would invite participants to reflect on how they relate to the concept of the supply chain, and reflect on potential future ways in which their research could benefit from the supply chain perspective. Discussion (2) would encourage participants to discuss what might be drivers and blockers of work around AI supply chains at CHI. This could be practical, organizational, or disciplinary challenges, that could potentially be solved by joining forces as a new interdisciplinary research community. Discussion (3) would center around the next steps for this research community. Led by the meetup organizers, this discussion would first consist in a synthesis of prior discussions and of the common themes that arose (to facilitate this process, the organizers will take notes all along the meetup on a common document), and then open to a larger interrogation about what the participants think could be the most appropriate next steps (e.g., developing a common research agenda, setting up case-studies).

3 Organizers

We have assembled a team of five organizers who all have conducted work around AI supply chains in the past (e.g., [2, 4, 8, 22]), have a foot in various disciplines (e.g., HCI, ML, systems, security, law, governance, STS, political economy), and have experience organizing workshops at various conferences (e.g., [3],[6]).

- **Inha Cha** is a PhD Student at Georgia Tech. Her research critically examines the sociotechnical dynamics, institutional logics, and geopolitical forces that shape how AI is developed and deployed.
- **David Gray Widder** is an assistant professor in the School of Information at the University of Texas at Austin, and an affiliate of Data and Society. He studies how people creating AI systems think about the downstream harms their systems make possible, and the wider cultural, political, and economic logics which shape these thoughts.
- **Blair Attard-Frost** is an assistant professor in the Department of Political Science at University of Alberta, and a research fellow at the Alberta Machine Intelligence Institute (Amii). Her research addresses challenges of power, participation, and equity in AI governance and policymaking.
- **Jat Singh** is a professor at the Research Centre Trustworthy Data Science & Security (RC-Trust, Germany) and the Department of Computer Science and Technology, University of Cambridge. He leads the Compliant & Accountable Systems group, taking a sociotechnical systems approach to governance, accountability, and compliance, with current research examining AI supply chains and service models.
- **Agathe Balayn** is a postdoctoral researcher at Microsoft Research. She has conducted extensive qualitative work in organizations producing and consuming AI systems, to understand the concerns of stakeholders along the AI supply chain, the factors impacting their practices, and the harms that might arise from their activities.

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