

The Supply Chain Capitalism of AI: A Call to (Re)think Algorithmic Harms and Resistance (Extended Abstract)

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Abstract

The more a product is desired by the world market, the greater the misery it brings to the Latin American peoples whose sacrifice creates it. (Galeano 1971, p. 77)

Dialogues surrounding the impact of Artificial Intelligence (AI) have revolved around bias, surveillance, and opacity. Yet in the context of the climate emergency, we need to further understand the environmental impact of AI and its infrastructure. Each stage of the AI lifecycle presents complex challenges. The extraction of the mineral resources required to manufacture AI hardware, such as graphical processing units (GPUs), leads to soil destruction and water pollution. The data centers needed to store large-scale databases and run algorithms consume a huge amount of energy and water. As data centers grow in size, number, and complexity, the demand for energy and water also increases. Moreover, these data centers are connected through a network of submarine cables that impact the marine environment through habitat damage or loss, noise, and chemical pollution. Finally, the local communities living near electronic landfills face severe environmental and health threats from exposure to toxic elements contained in digital devices and microelectronics, leading to respiratory issues and neurological disorders. This paper is an invitation to broaden our perspective towards algorithmic harms and resistance through critical and transdisciplinary lens.

Building on Tsing's concept *supply chain capitalism*, this paper proposes a theoretical framework to shed light on the material reality of the AI industry. This technology is woven into a supply chain of capital, natural resources, and human labour that has been neglected in previous debates about its social and ethical impact. Given the current surge in generative AI—which is estimated to use more natural resources than classic machine learning algorithms—it is vital that we better understand the politics of its production mechanisms. This paper offers a journey through the AI industry by illustrating the complex, diverse, opaque, and global structures of the AI supply chain. The supply chain capitalism of AI is orchestrated through big tech firms together with mines, semiconductor factories, data centers, e-waste landfills, and transportation companies. The paper offers an ethnographic journey to better understand how natural resources, such as silicon, are extracted from mines to build GPUs. Then, the GPUs are installed in data centers that in turn are using elec-

tricity and water to power AI algorithms. At the end of its lifecycle, GPUs are dumped into landfills across the globe. The supply chain capitalism of AI offers a novel approach by unveiling the material and labour reality of AI connecting local infrastructure through global logistical networks.

From a methodological perspective, this paper illustrates an ethnographic journey into a data center hub in Latin America—a very specific point of the supply chain capitalism of AI—and interrogates which harms and resistance emerged from it. To do so, it presents three months of fieldwork in México, which is becoming a hotspot for the data center industry—a key element in the supply chain of AI. While data centers promise economic growth and innovation, my ethnographic observations demonstrate that this industry is also contributing to environmental struggles. On one hand, Querétaro, a Mexican state with an industrial legacy, is concentrating a large number of data centers. On the other hand, it has become the first state in México suffering water stress in its entire territory. As a result, the Indigenous and rural community of Maconí, located in the mountains of Querétaro, is suffering from water scarcity. As individuals from the local community expressed, they do not have water to irrigate their vegetables for self-consumption and have to walk eight hours to gather water. In fact, this region has suffered the consequences of the industrial activity in the city of Querétaro and is demanding that the government prioritise their needs rather than feeding the industry with more water.

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References

- Galeano, E. 1971. *Las venas abiertas de América Latina [The Open Veins of Latin America]*. Ciudad de México (México): Siglo XXI Editores.
- Tsing, A. L. 2009. Supply chains and the human condition. *Rethinking Marxism*, 21(2): 148–176.