

The supply chain capitalism of AI (Seminar)

A call to (re)think algorithmic harms and resistance

Ana Valdivia

30 April, 2024

Ana Valdivia is a Departmental Research Lecturer in Artificial Intelligence (AI), Government & Policy at the Oxford Internet Institute (OII). Ana investigates how datafication and algorithmic systems are transforming political, social and ecological world

Ana writes: ‘Artificial Intelligence (AI) has woven into a supply chain of capital, resources and human labour that has been neglected in debates about the social impact of this technology. While the literature on critical AI studies have focused on algorithmic bias and opacity, the global production line that fosters AI innovation have drawn little attention. Building on Tsing’s concept of supply chain capitalism, this paper offers a journey through mines, semiconductor manufacturers, data centres, technological firms, data labelling factories and e-waste dumps by illustrating the complex, diverse, opaque and global structure of the supply chain of AI. Then, the paper moves into illuminating a case study drawn from six months of fieldwork on data centres in Mexico, Spain, UK and Chile, revealing that algorithmic harms go beyond code pitfalls. A close examination into the supply chain capitalism of AI reveals that other types of eco-political frictions are arising, particularly in the context of fundamental and environmental rights. This demands a broader and critical perspective on AI studies by considering the entire capitalist production line of its industry—from mineral extractivism to e-waste dumps—and its environmental and political consequences.’

<https://www.youtube.com/watch?v=vkKDJbeHJJY>

Good evening everybody. Thank you very much for coming out on this first day of spring in England.

So it must be reasons to, to wanna hang out on the street.
and thank you to everybody who’s come on Zoom.

This is a really, a very interesting new development for RAG to, have somebody who’s doing anthropology in the field around ai.

Anna Valdivia is lecturer in the Oxford Internet Institute, and on AI, government and policy.

Her research is looking at the transformations that Datafication are having on, a, a politics society ecology and she’s integrating a, a background of mass and computer science with anthropological approaches of field work and multi-site field work.

so this is really something very interesting for us and I’m handing over to Anna.
I’m gonna be helping her switch. Guys, thank you very much.

Thank you very much for, staying here in this summary today.

It’s a really value that you’re spending your, evening, today with us and thank you very much for the radical anthropology for the invitation.

I have to say that everything started on masteron, where you were kind of like inviting speakers, and I self proposed, I proposed myself and I was like, maybe selfish.

I then out to me again. Great. So, thank you very much.

So that happened because I have this impostor syndrome because, I'm a mathematician and computer sciences, so I'm not trained in anthropology or graphy.

So I really value today to stay here and I really value your feedback, about like the work that I'm doing because it is work in progress.

So I'm not like writing a, a paper, about the supply chain capitalism of AI given like the free work that I've done in different places that I will present today.

So, yeah, ire, I will really value your, your feedback as a social scientist anthropologist.

so as I say, this is a paper that is now going on review, media journal and this is a paper, this is my first paper after spending four months in Latin America, given a grant that I got from the British Academy and what I proposed to them was to analyze the political and environmental impact of data centers in Latin America.

Because what we're, witnessing in Latin America is that there are like, sort of like resistance against this data center and this is something that we are not seeing in Europe.

So there are like now different, countries in, in Europe where we are seeing resistance, but it is emerging now while in, in Chile, for instance, happened like a few years ago.

So I was interested in analyzing why is happening in Latin America and not this happening in in Europe.

And, if I found like this sort of resistance, what are like their claims? so I'm gonna start with a quote.

We walk for the water we need, if we don't walk, who will give it to us? If we don't show up in, there is nothing to gain here gain.

So let's see if we win the water.

We used to draw water from a well and it dry up.

It's gone because it doesn't yield anymore.

Since last year there hasn't been rain and this year it's the same. That's why it dry up.

Then the mine, her, us, the water went down and now there is nothing.

If you don't carry it, there is nothing.

So in total is a four hour journey each day to fetch water.

Those who, who can take about 10 liters, those who can take more than 20 liters, and those who can't, nothing.

Well, there in our community, we are used to planting beans next aal, and they're using that, water for, they're using the water.

We are using the water for radiation.

Then you have to wash the dishes and it's done.

You have to go for another water tree.

So Juan, with, this, man here is a middle age man born in the indigenous and rural community of McNee, Mexico and the author of the previous code, I met him during the protest organized by his community in front of the city hall of ro, the capital of a Mexican state, where they demanded the fundamental right to access water.

At the same time of this protest, during October, 2023, relo is becoming the largest data center hub in Latin America.

They're already hosting 10 data centers, and the local government is inviting 18 projects more.

These, these projects are gonna support technologies like Chad, GPT in this region.

Data centers together with food, industry and aerospace industry are extracting water for their economic businesses.

Whereas Juan has to work almost a day to water its beans and mixed amount.

So, So in fact, data centers are considered water intensive industry given the amount of water that they, they need to cool down.

The servers in this piece are that the critical debates about algorithmic resistance and harms, a coordinate harms need to move forward by taking into account also the impact that the infrastructure of AI is, having on communities like the one in.

So it's not only about the impact of the algorithm, it's not only about how much bias is in the data or in the algorithm, it's also about the impact of the infrastructure that, it's just to train these sort of algorithms and to store these, data sets.

So here, for instance, we have a video of, Nvidia n Video is becoming the first, the most important and relevant, company about, infrastructure.

Ah, yeah, something I think you cannot see on, on Zoom.

so basically is, can you zoom guys? See it? Okay, now You see it? Yes, yes.

Thanks. Thanks.

So media is becoming, one of the, largest suppliers of, semiconductors of tips.

It's hosting the 80% of the market.

So that means that all the data centers in the world are, taking, GPU's, tips from this, company.

So it's becoming a very, very significant and relevant company in the market of, ai.

And, I was in, data center exhibition last March here happening in, in long run and it was very interesting because the data center businessmen were blaming n Vivia because while data centers are taking all the bad reputation saying that, oh, data centers are taking all our water Nvidia, designing the chips.

So Nvidia is actually the, who is making the, the problem, right? By creating and designing these chips that are using, a lot of, water and it's what, and what is happening recently is that, okay, we had AI for a long time.

So when I trained, I studied my PhD, I was training machine learning models, but these models are very, simple.

You don't need a data center.

I can train a machine learning model in my own laptop.

What happened with, infrastructure like, algorithms like chatty PT is that you need more sophisticated infrastructure.

You need, these GPU and these chips that basically are more powerful.

So that means that they're using more electricity, more water, more land.

So we are gonna, see an increasement on the amount of water and energy that AI is gonna take, because of its innovation.

So, the development of advanced AI products like chatt pt, relies on the supply chain capitalism.

and as demonstrated in, in that paper that I wrote, it creates both great wealth and great poverty.

For instance, open AI algorithms, Chad GPT is built on a supply chain of minerals such as silicon tantalum.

So these minerals are used for, manufacturing the GPUs and turn into, so you take the minerals, you create, you manufacture the GPUs, and then you send the GPUs into, data centers.

So in fact, OpenAI relies on Microsoft.

Microsoft is providing the data centers so that OpenAI can train algorithms like, chat, pt, and then NVIDIA is supplying the, microchips and what is happening in this, supply chain capitalism is that, basically these companies are becoming, the most powerful, companies in terms of, market capitalization.

They are, in like they are taking the top positions, over the years.

the difference with, all capitalism or like analog capitalism is that they are accumulating also like more capital.

So are, they are becoming richer and richer and for me, this is a, difference between, analog companies, and, big tech companies like, Microsoft, apple, Google, Tela and PSNC that we'll see.

So TSNC is, basically manufacturing the GP four Nvidia.

So Nvidia is like a fabulous company.

It doesn't, it doesn't have factories.

It relies all, his, it's manufacturing into TSMC, that, so those figures moving are dollars.

Are we, so yes, dollars, yeah, dollars, yeah and you're see seeing the changeover of which company, Yeah, got, yeah.

So it, this graph shows the evolution over time of the most important companies based on market capitalization.

So how much capital do they, have a, and what we are witnessing is that big tech companies are taking the top positions, and they're also accumulating more, more, capital, right? Because you also see how these horizontal axi is also increasing, they're accumulating more, more capital.

So, in this paper, I propose this theoretical framework building on the supply chain capitalism of the anthropologists and SDS scholar that refers to the commodity chains based on subcontracting outsourcing and ally arrangements in which the autonomy

of component enterprises is legally established, even as the enterprise are disciplined within the chain as a whole.

So team proposes, ing proposes this conceptual approach to show the heterogeneity of contemporary global capitalism.

While supply chains of capitalism are difficult to follow, and no one can fully keep track of the activities of every firm on the chain, some companies rely on supply chains that depend on things that break not just national laws, but also every humanitarian and environmental standard along this essay seen in by us to stay politically close to supply chain's, hierarchies, and consider supply chain's access to shed light on how exploitation becomes possible through classism, sexism, and racism.

So thing analyze, analysis was published in 29 when Walmart, the retail firm based in the US was considered one of the largest corporations in terms of market capitalization.

However, big tech companies have transformed this scenario and are now considered the most important companies with contemporary capitalism as the previous graph show.

So in 2023, apple, Microsoft, alphabet, and Meta are occupying the highest positions and also companies like Nvidia, the AI chip supplier, is also taking the sixth position in market capitalization.

So, as I said before, this company is, taking the 80% of market share of, chip suppliers and, and, chip supplier and design.

so Invidia revenue has grown over the last decade, and as a result of the AI race, it is considered the only trillion dollar semiconductor firm in the world.

So this paper contents that while much attention has been paid to, big tech companies, and the power that they concentrate less attention has been brought into the supply chain, which is a key concept to understand the dependency on natural resources and labor exploitation.

In fact, the supply chain of AI also relies on commodity chains based on subcontracting outsourcing and ally arra arrangement, where labor, nature and capital are mobilized in fragmented, but linked economic, economic niches as seen, analyzed in her paper in publishing 2029.

So basically in this paper, what I argue is that seeing, seeing analysis can be deployed nowadays in these big tech, supply, chain.

So within this scenario, the supply chain capitalism of AI refers to the logistical network of connections across the globe that extracts, produces and distribute resources, materials, and products to make this technology possible.

Today, the economic needs are linked to mines, tech, factories, data centers, ewa dams, as well as to data leveling factories and big tech companies training algorithms such as chat g pt.

In fact, a supply chain capitalism on AI makes visible the connection in the uk sorry, makes the connection between, an engineer at open AI training an algorithm such as chat g PT in the uk, a minor structuring tantalum in Pakistan, an engineer in a data center in Mexico, monitoring the performance of servers, a data labeler in Spain,

annotating hate content from social media, or a worker in Taiwan manufacturing, A GPO or a worker in Kenya, that this monitoring electronic waste, there are different infrastructural elements that are key in the context of, supply chain and here you have like the different phases that, I propose to, conceptualize this idea of the supply chain capitalism of ai.

So first we have, the natural resource extractivism.

So resources, minerals like, copper or tantalum are extracted to, manufacture wires and, GPUs.

Then we have the tip design and manufacturing.

So these, minerals are transformed into chips and then when these chip are designed and manufactured, they are shipped into data centers where algorithms like TGPT are, trained.

and what happened in these data centers is that, after, for instance, five years, they have to basically get rid of all the infrastructure of all the electronics, and they have to bring new electronics.

So this phase is also, creating a lot of electronic, ways.

we have to think that, um every fi five years, if we think about the amount of data centers that we have around the world, that's a lot of, electronic, ways that we are creating.

So I, or also like, designed this map to show more graphically, the global aspect of this supply chain capitalism, because it's not happening in one location, it's happening in different locations across the globe and I got access to an NVIDIA report where, they have to disclose from which countries and companies they are taking their minerals to manufacture the chips like gpu.

So for instance, in this report, they say that they are taking gold from Colombia, they are taking tungsten from Brazil, they are taking tantalum from Pakistan, they are taking team from China, and all these minerals go to, Taiwan to TSMC, this company that this manufacturing, all these tips for, Nvidia.

So, it's also interesting to see that TSMC is located in Taiwan, because when you also think about the geopolitical tension between the US and China, because of Taiwan, one of the main reasons is TSMC is because it is the main, factory, manufacturing in GPUs in the world.

What g Yeah, GPUs are, the tips that are used for, AI algorithm to train AI algorithms like chat GPT.

So it is used for gaming.

GPU started because of gamers because they want the, like better graphics.

And, and then the industry decided to design a better, tip that could improve the graphics on laptops and then, AI engineers realized that these chip could be useful to train more sophisticated algorithms like, deep learning algorithms or, chat GPT.

so once, TSMC is designing and manufacturing a GPOs, Nvidia supplies all data centers across the globe with, their different, products and as this map shows, data centers are scattered across the map.

We have data centers basically everywhere, and data centers using ai, training, AI algorithms have to, obtain these semiconductors, these chips.

So, after these GPUs are, sent to data centers, data centers connect the GPUs and everything, the AI starts happening.

So we have the engineers, coding the algorithms, but we also have, for instance, data annotators in, for instance, Kenya annotating, hate speech content for social media in order to better classify, hate speech.

we also have, as I say before, engineers are open AI or at Google working here, in, in London.

So we also see like how, we have this more material aspect, so like these miners taking minerals from, mines, but we also have this more, technological, aspect, right about like when we think about these engineers at Google or the mine coding these, algorithms and finally, when the technology is not useful.

So at the end of the lifecycle of this technology, data centers and tech companies send, or also universities because there are also data centers, in universities, they send their, electronic waste to, e-waste dumps and I suppose that you're aware that most of the, electronic waste goes to places like Kenya or Ghana, although the, key waste dump in Ghana has been closed, right? Because of the concerns regarding the environmental impact that then the local community is a bit angry because it was the main income, like to disclose and to, take components of this ewa.

So that was like also this, this friction, right? When in the global north we say, oh, it was down, they are like, but for the environment when we, we need to think that maybe it's like, an income, like an economical activity for the local community.

so, moving to the more empirical aspect of, of this, research, I, I question what do we see when we look at this supply chain capitalism from below? And, and on the left.

So, I don't know if you are familiarized be with like this, framing of below and, and nonetheless, but, in Mexico I had the opportunity to, to meet, linguistic and Mi m which name is Jas Elena Aguilar Hill and she has advice about the material struggles that AI industry is originating in their, in, in her community.

She has questioned this industry, given the amount of natural resources that is needed to train and deploy algorithms such as Jat pt and I quote, while in the metropolis, the development of AI and other new technologies are celebrated and open debates here, other questions arise.

How much more extractivism can the people and territories, which have historically been exploitive, sustain the growing demand of minerals required by new technologies? In fact, Aguilar's reflection reveals that other struggles arise when we look at AI from below and on the left and this expression was coined by the tab in, 2005, referring to the perspective of those who are not guided by trends, by, but by, by commitments from those, despite by intellectuals, the media, governments, and professional politicians from those who are not in the, in the cemetery, the limbo where they disappear away justice that will not come from above, but from below and to the left from the field.

So Tapist say that we need to look at the world from, these people, that they are not, they don't want to gather more power, so from these people that they are happy with, like, an easy life, right? And for me, that, that, narrative was very interesting because, when I was wondering, okay, I'm a computer scientist.

I'm, I'm a lecturer at University of Oxford, and I see all the political economy that AI is creating.

What, but what, um people like, Ja Elena or all the people that, that Juan, the, the man that, we, in, I introduced to you at the very beginning, what do they think about the supply chain capitalism, right? How do they, see this, this concept? So for instance, Aguilar Hill interrogates about the impacts that AI industry has on territories and communities from below and on the left, by question, how this industry could ex could extract natural resources from, from communities in, in Mexico and this is what I observe in my field work and during three months in Mexico and in Chile, so in, in Mexico, I spent part of the time in, Ello that is a state in the center of the, country.

what happened in, in Ello, as I said at the beginning, is that there are like already 10 data centers, constructed.

So this is a map that I created myself, because there's no map about how many data centers are, in, in and through like, desk research, I was able to map them on, on, on this map to also like, have, activists that, were protesting and they're aware about the water struggles in, in Carta.

So that was very helpful for, for them.

So what happened, on one hand we have like these 10 data centers located in, in Carta and the local com.

the local government is inviting 18 data centers, more.

So for instance, when, I came back from my field work, I just saw that the, go nado of, so president of the state, was welcoming, huge investment by Amazon.

So Amazon is gonna come also to, to ro to put his, its data center also there.

So we have data centers on one hand, and then on the other hand, we have, this map that shows also part of RO and, so the community of Mac.

So Juan was born in, this area, this area, here.

So Mcni is a very nice, region in Rero, has a lot of water, is like, the countryside is amazing.

The nature, is, stunning.

so what happened 17 years ago was that the local government of Carrero went to Marconi and talked to the people of Marconi.

You don't have access to waters.

You have very nice and very beautiful water springs, but you don't have access to drinking water in your own houses because in Mcni, is a rural community, they don't have access to drinking water in their own houses.

So the local government, told them, we are gonna improve your infrastructure.

We are gonna give you drinking water, but as an exchange, we're gonna build a pipe, a 100, 2100, 23 kilometers long pipe.

So it goes from here to here to Reta.

So this is like the city of Carrero, and we are gonna take your water by in exchange, we're, we're gonna improve your infrastructure.

So that happened 17 years ago and when, I was in Carrero in, October, 2023, I observed like a protest and these people, this community from were protesting and they were saying things like, it's not draw, it's looting waterfall, the people not for the businesses.

And, I asked them, what, what, what happened? What is going on? And then they explained to me this case of like the local government coming to their community, promising them drinking water and after 17, years, they build the pipe.

The pipe is, bringing the water to the industry and to the people in the city of, but they, don't have seal access to drinking water and even worse, this pipe, is taking the water from their, natural resource, their water resources.

So Juan, for instance, was telling me before I had to walk two hours to take water. but now that place is draw like there's no water anymore.

So I have to work even farther to take water from, long distance.

So I have to walk, more.

And, this video, for instance, shows the, how big the industrial parks are in Carrero. so this is an industrial park, and there are like five or six industrial parks in, in Carrero.

So part of the water from this pipe, from the pipe that, the previous map is, so goes there, goes to, to these industrial parks and in this industrial park is where the data centers are.

And, I also got access to, some official reports that, explain or show, how much, for instance, electricity the new data centers are gonna, take.

So for instance, here we have, the name of the project, the companies that we say we see, Amazon, we see, Microsoft, and the location, and how many, MegaBots are gonna, these data centers take.

So we see, for instance, that Microsoft, it's gonna take, almost 50 MegaBots more than the other data centers.

And, the reason of this is because it's gonna host chat g pt.

So these, data centers are gonna be used to, yeah, supply services of, of chat g pt, reason why it needs more, electricity because the GPUs need more.

yeah, basically more at, and then it was very interesting to also see another data center in ico, which, companies or origin or origin and it's gonna take 220 megawatts.

So, four times more than the, touch PT data center and doing research.

I figured out that is a, online gaming company.

So while it's true that I'm focusing on ai and ai, it's gonna take, it is taken already, like the industry is taking a lot of resources online.

Gaming is also taking a lot of, resources.

So I invite, some of you to do also research on the environmental impact of online, gaming.

so after Mexico, I also got the opportunity to move to, Chile and I was in San Chile for a month, and I was interested in Akeda also, online, and in this case of, an Amazon data center coming to Waba in Santiago Dele.

So Waba is a very interesting borough in, Santiago Dele because it's super working class.

So, I went there to, do my, interviews and myography and people are very humbled. and, and you see, I also come from like a working class, borrow in Barcelona for me.

Like it was very familiar, right? This sort of like, community and, and environment and what, so what happened there was that Amazon decided to come to Ava to install a massive data center and something very interesting about Chile is that, his, it's government is very accountable because they have a platform, that everyone can access and any project that comes to Chile has to submit its environmental report there.

So you have access to environmental reports of every company that wants to deploy its services in Chile.

So for me, that's very accountable because for instance, in the uk, for, we don't have that in Spain, either, right? So the people of, with, they are resisting different, they, they're fighting different, fights, right? For instance, they told me about housing, they're struggling with, housing, and, they monitor with sort of like products are gonna come in order to destroy their, bottle.

So this is how, realized that Amazon was coming to deploy a data center.

But in the environmental report, when they were analyzing the environmental report, they also observed that there was another project related to this data center.

But the environmental report was treated into two.

So divide and conquer, right? Because if you divide the environmental impact of like your business, it's like, oh, it's not that, because you are splitting it into, into two rather than, when you it together.

So this is what Amazon did.

Amazon, reported it's the environmental impact of the data center, but they did not mention that together with the data center, they're gonna build these, electric towers in this mountain.

That for the people of guava is very important because they create, they organize all their activities, there.

So, for them it's like they're gonna protect this mountain as much as possible.

So, they realized for me, it was very also interesting to see how these people that they are not academics, they are not lawyers.

They just like read the report, environmental, impact report and they observed that Amazon was doing something illegal because, this is, you cannot do that.

you cannot split the environmental impact of one project into into two.

So they bring, they bring, Amazon into court, and now they are dealing, with that because they were doing something, illegal.

and also it was, even more interesting, the community of guava invited Amazon to come to guava and explain to them what they are gonna do, with this data center.

So this is an image of the, session that they hold in, in, in guava and they told me that, in the session, Amazon, the people from Amazon started by saying, no, the data center is gonna improve your Netflix connection.

You're gonna have like better connection with Netflix.

They, they, they also told me that they, brought like some cookies and teas, for the people.

But these people, are, um they, they know they, they're chicken and they say to Amazon, if you are gonna bring this project here, and it's gonna bring so much benefit, why you are not taking this to rich borough? Because rich people always take the best.

So if this is gonna bring like a lot of profit, why you don't bring it to, the, rich borough.

So they were also like organizing some protests, on the street and clearly like against Amazon saying like, we don't want, this project, we don't want these towers in, our world.

So, finally to, conclude, the talk, today, so in 2024, the most powerful companies are big tech companies.

In this context, supply chain capitalism, the concept coined by Anna Singh 15 years ago is still valid today in the era of digital capitalism.

This model that was proposed for understanding both the continent crossing scale and the constitutive diversity of contemporary global capitalism illustrates us the complexity and diversity of supply chains as a key element of capitalism.

So while seeing sensor hair analysis in two of the biggest corporations in 2009, Walmart and Nike, this paper proposes to focus on the AI industry and its supply chain.

Supply chain capitalism offers a theoretical framework to take into account the production line of AI and its infrastructure from mines to waste and account for geographical asymmetries.

As we saw in and environmentally struggles as we saw in Chile, that that might not be evident.

The people from McNee were not aware about the large number of data centers told in.

However, this territory shows geographical asymmetries and social inequalities regarding the access to water that stem from the supply chain of ai.

While it is not the goal of this paper to track companies, firms, components, products, and actors involved in the supply chain of AI using a follow the thing method, take us a closer examination into the supply chain of AI from below and on the left and this approach might unveil environmental struggles and labor exploitation.

So to conclude, while data centers are welcome, the indigenous and rural community of NY in Mexico and the working class community of Waba in Chile are struggling to get access to, water, to fly to water mixed al or to take care of their, mos Looking through this lens, the supply chain capitalism of AI intends to open a critique towards the growing AI industry and build a world of many worlds where everybody fits.

Yeah. Thank you very much.

we can take Okay and ask four questions.

I'm gonna switch this off, shall we? So that you Yeah.

Can take a seat and be safe. Yeah. So that, have more light.

anybody would like you, I want you in the camera still.

Sorry. Yeah. Come, come in the camera.

I can bring the camera down if you'd like to sit it.

We can see her over there, Camilla. We, we can see.

Okay. Okay. If you wanna sit. Thanks.

any questions in the, in the room first and then ask on Zoom as well, Kathleen? Sure, Sure. I, I'm kind of an embedded polished anthropologist in the shared hybrid space and like Metaverse European version at the moment and one of the questions we ask keeping the ethnographies is, is, about, for example, about, environmental effects and there, yeah, I can't really say what the answers are, but it's been very illuminating to have this fodder to I can reflect back.

So I want to thank you. It's just really fascinating and important stuff. Yeah.

Thank you. So that, just to, for Zoom, just to say that comment that, that you are working on ethnographies in the metaverse we a virtual reality of a virtual, virtual reality one, Which uses a Lot. So do you call yourself a digital anthropologist then, or what? Not yet. Not myself, evolutionary.

You're still evolutionary, but into that sphere. Yeah.

So, yeah.

So you're very interested in the environmental aspect, and that's one of the questions you, you ask.

Yeah. Yeah. So we just repeat anything so that people on Zoom questions Yeah. But this was very useful.

That's what I'm say for my own knowledge.

It, it educated people up.

Yeah. Yeah. I think it educated a lot of us a lot to see how the things all connect up and it, it is like this kind of octopus of Yeah.

Pentacles of everything and how how can we bring that Yeah.

The, yeah. How, how do we bring that to consciousness? Yeah.

Yeah. And it's very funny that you were saying octopus, because actually I'm saying that on the paper.

I had an interview with, data center director, and he told me that data centers are like octopus because they re they depend of like, so many suppliers because it is like the, semiconductors or like the tips, but also, water.

So the pipes, and also fuel, and also energy.

So it has like a lot of different arms.

So many arms, yes. Manchego, you wanna go? Yeah. that was a great, by the way, just fantastic.

But I, I didn't hear you mention, I, I, I may have just missed it, but did you mention blockchain at all in this, the Bitcoin and all that stuff? That's, that, that's the big thing that's been going on in the States.

We know they're coming in and they're, they're taking the water, water supplies, the whole, the whole cities and using it Louder. So yeah. In, no, we can't pick up here.

So, so the question is about blockchain.

Yeah. So I don't look at blockchain because I want to narrow down Myography, looking only at ai.

There is a lot of research on, on blockchain.

I think that the attention at the, in the past has been on blockchain and how much like mining bitcoins.

so like looking at the environmental impact of mining, bitcoins, I know that actually the US is a country in the world that is costing, the largest number of data centers.

So, like the US regions in the US are only struggling not because of, the mining of Bitcoins, but also because of the hosting of data and algorithms like Chad, GPT.

So, and for this, I can refer to Mel Horan.

She's a media scholar, and she wrote a very nice paper in 2015 talking about the struggles, what struggles of, a data center in the us.

Any more questions online or Yeah, Yeah, precisely and there is another, just repeat that. Oh, yeah, sorry.

so the question was why, data centers have to clean up their, electronics after five years? And the answer is that basically because they become obsolete.

And, that was a question I was asked in Mexico by student, and I was very shocked by that question because, and nobody has asked me that before.

It's like, are they doing that on purpose? So like, are they designing GPUs that only last five years so that they have to buy more GPUs? I was like, wow, I never thought about that.

But that could be possible because we, we know that they are doing that with machine machines and, and so and so, yeah, basically it's, because they become obsolete and they actually, clean it.

Like they, they remove it before, five years because data centers, they are like a very critical business.

If something goes bad, they lose a lot of money, because imagine like zoom, imagine when we don't have access to our inbox.

Uh at University of Fox we have Microsoft, imagine like if a data center, Microsoft data center doesn't function, the amount of money they lost is massive.

So they want to control everything, and then they don't want to reach out to the last year of like, the technology.

Right? So they clinic before that happen.

Yeah. Following, up with that and the cycle that goes to, so all that cleared out goes into the e e-waste dump Mm-Hmm.

how much gets recovered from the e-waste dumps? Or is it real waste? What is happening with that? So, that's a very interesting question, and there is a nice paper I can share by, a scholar that I'm in touch.

She works in the private sector, and she's, advocate, she kind of like builds or designs works in projects to help, data centers to become more sustainable.

So for me, she's an expert on data center sustainability, and she wrote that paper analyzing the, lifespan of every component in a data center.

So you see like the lifespan of pa of, pipes of, chips and, and everything, any like element you can find in a data center and then she also reported, the percentage of like materials that goes to like a recycling, a recycling plant and the percentage of materials that you have that you can't do anything, you just like throw it like to the landfill and is impressive because, the largest percentage are on those that you have to throw it.

Yeah. The amount, the, the percentage that you can recycle is very, very little.

Yeah. And it's very costly also. Mm-Hmm mm-Hmm.

So when I was in that data center exhibition, the data center businessman, they were asked, talking about how to become more sustainable and they were saying, let, let's recycle everything, right? Because if we recycle every, everything, but then they were saying, no, but this is not, we, we cannot take profit from, recycling and actually things that are recycled doesn't work as, as, well, as things that are not recycled.

Doesn't pay Yeah. It doesn't Say risk.

Really brilliant talk and I'm, I was, I'm sort of surprised at myself that I found it so new online.

Why have we not been following this? I mean when you said it, of course, yes.

He's our far the biggest corporation, far the most powerful one.

Somehow, most of us on the left haven't really caught up.

So I mean, real congratulations. It's really fantastic.

But maybe my prop, my, I got slight confused to the last slide, and possibly it's just a matter of language.

Mm-Hmm. But, but anyway, the slide was sort of saying that supply chain capitalism, it is a very good thing because it has good intentions and the intentions are to open a critique of all this stuff.

But you're using the term supply chain capital as your, as not as, as your positive project and resistance.

I'm just wondering, I mean, I don't know, is that, is that intentional? Are we supposed to be a bit puzzled and then work it out? Yeah. It seems like this, the actual cabinet of itself has got good intentions.

Can we repeat that Point? so the question was about the, last slide where I was presenting the conclusions and saying that, supply chain's capitalism is sort of like a good thing because, but my intention is like, is not that companies are doing good and so my intention by saying that the supply chain capitalism is a good thing, it's from a theoretical perspective, it's because it's, it helps at least me, to shed light on

the political economy of, ai and not only focusing on big tech companies, but also like having like a broader picture and thinking that when I'm training at ch at Chad GPT, and I'm calculating the carbon footprint of uht GPT, I also need to calculate the carbon footprint of, taking, extracting lum in a mine.

Right? So it's, it is, for me, it's beneficial, but in a theoretical way because, because it, it helps me to conceptualize this, political economy. Right? Right. Very compelling answer. But actually, It's also taken from Anna Sing, is it the, the concept, right? Yeah. So it's her, it's her idea of putting together that whole map of everything linked together, that's Obviously very positive. Yeah.

But call capital, yeah.

Confusing To me.

Yeah. Okay.

I mean, I'm not saying that capitalism is a good thing, actually.

I mean, I'm criticizing The, the means of analyzing Yeah.

The monster, isn't it? anymore Kathleen.

Yeah. so the EU has, as well as this principles of course, protection of the environment, which they've, which they've talked about.

In your ideal, in your ideal world, planet, what would you say to the EU in terms of environmental protection? In terms of ai? that's a big question. Just repeat that. Yeah.

Sorry, I, I forgetting.

So the question is about, what could I say to the European Union in terms of like, protecting our environment, given my, my research? That's a big question. so there is a new legislation coming in two weeks, regarding data centers.

So data center, data centers above 50 megawatts will need to report, their elect, energy and wa water use to the European Union and I don't know if you remember, the amount of megawatts of the, data centers in Mexico by Microsoft.

Do you remember the name, the number? Sorry, 50 49. 49.

Yeah. so the legislation will, oblig data centers above 50 megawatts to report and the data centers in Mexico were four, 49 point 50 mm-Hmm.

So they are noting the law, right? so this is what happened.

I mean, for me, we need more regulation.

We do need more regulation.

I mean, we don't know, for instance, in the uk, London is one of the cities in the world, having with the largest number of data centers, we don't know how much water they are using.

I asked things water, I did freedom of inform information petition, and they told me they don't know.

so we need more longer Here.

Yeah. That's the reason. Yeah. We regulated maybe.

So what I would say to European Union is that we do, we, we need more regulation and we have to do it better because I think that this, this, business activity has been, there's no regulation.

I mean, there are like standards, and there are like some regulation regarding like, their industrial activity.

But there is no regulation, focusing on, on data centers and for instance, I'm from Spain, and in Spain we have meta coming to a rural, region, and it's gonna take a lot of water and we don't know what are gonna be the environmental impacts yet and the project has been accepted.

so yeah, we need more. Thank You. puts, another light on the whole thing about Brexit and the Tory policies that they wanna make London the place where all the data centers can come and no regulation that that's, that's, that's the story.

Yeah. Payment islands or of data centers. Yes.

Saravia, would you like to? Yeah. thank you so much. This is a fascinating talk.

I want to go back to, I think one of the earlier slides which talked about this topic in terms of algorithmic harms and resistance.

A lot of the work around algorithmic harms talks about like fairness bias in ways as if they can be fixed and the approach always is a good ai, a perfect AI or a fair AI is possible.

But what you've shown also looks, looks at the harder questions where it may not just be possible.

So I wonder if how you would view, an alternative if, if it would be a revisionist approach or an a abolish, perspective.

There, there's a whole range of conversations going on.

So I was curious, given your experience in this work, how you, would you view it? Thank you very much.

Just saying, did people hear, did you, did you hear that or repeat? Oh, you heard it.

You heard it. So I don't have to repeat.

Well, basically the question, thank you very much for the question.

I really like that question.

so the question is given, the algorithmic harms, all the literature on algorithmic fairness and saying that it can be fixed.

So how algorithms are harming can be fixed, or it's very difficult to, to fix it.

what is my alternative? so I'm, I am advocating for evolution in technology, or I think we have to go like, step by step and something that, for me is very dangerous is like climate change.

I mean, we are not taking all the actions we need to take in order to, we are not gonna mitigate c climate change, but in order to protect, um society, but on only society also like, the environment and such, like the animal, the birds, the plants, and with this, system with capitalism, we're, not protecting that.

We are not taking any, measure on, on this.

So I would say, like, in my ideal word, I would stop writing papers.

I would stop like, giving talk like this one, and I would start like growing plants and living in a community.

So that would be my evolutionist approach towards, technology.

But we cannot do that.

So I think we have to go step by step and the first step, and that's related to the previous question, is start by regulation, is start by putting like legal, legal frameworks on, these data centers.

Given, given like the context of climate emergency, I, thinking also about regulation, it always seems that we are a little bit late to the facts.

we're all always too late of what's going on.

So the regulation that's about to come, it'll be 50, and they already have the solution doing this sentence that, with, 49.5 and anyway, it's, it's, it's going to be done with 50.

And, would there be another kind of way of action that, was, that possibly was not based on, I mean legacy or loss or regulation or this, this way of acting that seems to be too, maybe too old or maybe too slow to the kind of challenge Facing? Yeah, yeah.

So the que the question is if we can move beyond regulation in order to tackle this, problem.

I think so I think we can, at least like have, like the idea now when, we send an email or, we are like on Instagram to realize that this has a supply chain, that it has a contribution, it has a environmental and political contribution, right? so to every time that we are consuming something, for me at least, it's very in, it's very important and it's very relevant that, we are aware about this supply chain.

So for me, like informing people about the environmental impact of, technology, because, when I talked to, I was talking to people in Mexico, do you need water? Okay. when I was talking to people in Mexico, in the protest, they didn't know that data centers were there.

They don't know how much water they are using.

So I think that another action we can take is like to start informing people, but to start informing people, we need to know how much water and like what are like the environmental impacts of, of, of this infra infrastructure.

But for me, this would be like something to, to do and spend less time online on, more like in, in gatherings, because I think we are like sort of like missing this in, in our societies and this is something I saw in Mexico, like, they spend a lot of time in the street, they dance in the street, they eat in the street.

It's true that the weather is nicer than in the uk.

but when I came back to Europe, for me, I was shocked, right? Because after spending so much time in Mexico, I realized how much digitalized our lives are and how much time we spend and I'm, yeah.

I, yeah.

thanks for, I really, you've already responded to a question about, sort of international legal framework that is, affecting the, and I was wondering, in your research between, and Mexico, I was wondering if you have encountered the perspectives of local authorities or local councils who are experiencing, public protests, and how they are responding to this challenge of global capitalism within their, very local jurisdiction? Yeah. So the question is, if I found in Mexico or, Chile local councils, um reacting because of this, sort of protests, and that's a very interesting question.

because I found disparities in Mexico and Chile.

So while in Mexico, the local government of Korea is inviting more data centers and if you check, her, his Twitter account, his pro technology, he wants to build a Silicon Valley.

he was very proud of announcing this huge investment by Amazon.

So you could see that, the council is inviting more data centers and they kind of like not see the struggle of their people in that community.

In, in Mcny in Chile, I saw a different, thing.

So in Chile, there is this case of a Google data center that, my colleagues Sebastian at Kings College, analyze in, in the past.

So in that, what happened in that data center was that people were protesting, because of the water, the amount of water that Google was announcing that's gonna, that data center would take, take and at the beginning, the, local council, they were like, oh, but it's gonna bring a lot of jobs, because this is what they are always say, right? It's gonna bring innovation jobs, progress to the region.

But then the protests, increased and they took the street and then, the council changed its mind, their mind, and they, yeah, they went with the, local community and say like, no, we are gonna stop this, data center and when the local community in Chile, they brought that Google data center into court, the local community sort of like adjoin them.

so this is what I saw in, in what, what Sebastian saw in, in Chile and in guava, because the thing is still going.

So, now the local community reported to the local council that they were doing something illegal with splitting the environmental impact, in that case, the council is like ambiguous, I suppose, because they want the data center there because bring a lot of money, but they're also seeing like elections and they don't want people against.

So this Yeah, it's, it's, it depends on, on, on the region, it depends on the time, like if there are elections going on, and Yeah.

But thank you for the question. It was very interesting Sort of, yeah.

You, you, you, you, you, when you are listing these companies, the, the megawatts that they required you came to the company that was producing gaming.

Yeah. And, and it was like four times, five times any, the others just make me think about, I never the great astrophysicist for both a neuro disease.

Stephen Hawking, just before he died, he was asked about what happens when we destroy this planet and he was quite cheerful about, but we always go to a, lots of,

lots of other places out the universe we can go to and I believe Stephen, Elon Musk, yeah, was asked a similar story the, and said, well we're building rockets, we can go to other planets and it sort occurred to me that what's actually happening is people aren't going to another planet.

Mm-Hmm. And it's completely imaginary gaming planet with all the really exciting stuff happens in a world while you are relating this imaginary, you could find planet Yeah.

You're destroying the only planet which is actually live.

And, I'm sorry, it's, it's not exactly a question, but, but it does, I mean, I suppose the question is, given that this is the, the hugely most hungry of all these horrible corporations Yeah.

wouldn't it be turn off brilliant analytic attention to this, this, this monster.

Did, did Zoom hear that? Sorry, it's a bit longwinded.

Oh, did, did Zoom hear that about the, the gaming? Yes, we did. We heard it fine. Yeah, fine. Great. Okay.

so I think you talk, you should talk to Kaylin that is, yeah.

Is an activist by, tech, not tech for tyrants, right? Not with gaming, Not with gaming, but with the tech companies.

So they're like, organizations, kind of like doing activism against these tech, tech companies and I suppose you're aware about Palestina and Google, developing or giving their services to the, Israeli government.

Mm-Hmm. And using ai, algorithms to monitor and target, um like points.

So there is a lot of protests.

We, we need to also take that into account because sometimes when I give this talk, people are like, we are gonna die.

Like, you, you are so pessimistic.

I mean, I, I want to believe that we have a better world and like there is, and we have like organizations like not Tech for Tyrants and other organizations, um extinction ion, here.

So we also need to talk, to see that, right? To see these other, other side, like yeah, there are like these people like Elmo, El Musk saying, I'm gonna bring my rocket to, to Mars and I'm gonna create my society.

Mark Berg bought a massive island in, I think in nearby Hawaii, and he's building like walls, massive walls in the island.

Just Excel. Yeah. Yeah. so like, good for them.

I prefer to, I don't know, maybe I'm misanthropic, but I prefer to live in community and to take care of each other.

I think it's, Trust from Below on the left.

Yeah. We got more on Zoom just Says.

Yeah, yeah, yeah. The new book.

You Always speak about data, but you open more different, Yeah.

Sorry, what's the book? Kate Fufu. Yeah.

Who's that? That's, y Yeah, yeah. Has a new One. Janni the course three economic minister. Yeah.

Who was Chuck out of Germany or refused to be able to speak in Germany.

I, I heard, podcast, Novar Media.

They interview him and he talks about the book.

So if you don't want to buy the book, you have also the podcast.

I'm not against Barki, but Yeah.

I think that in this, so given that concept of, techno feudalism, moral of, has, written about that long time ago, ov I think he has also like some, texts, in, in the Guardian, about China humanism, but yeah.

Trying to save capital. Yeah, yeah, yeah.

I may be, naive, but we've got this, this wonderful, this map of all the, yeah.

From the mines to the GPU manufacturing, to the data centers and then the e-waste dumps or what, what are the prospects of, or is there any kind of linkage going on in of the communities in solidarity, say from the mines in Brazil to Taiwan to, the e-waste dumps and so forth.

How, how is that going? Yeah.

Is there any sort, sort of thinking about how that, how we get Yeah, thank you very much, Solidarity.

Exactly. No, thank you very much for the question, because I think that's also very important, right? To see that when we are, fighting and resisting, we are not alone.

There are like other people also fighting and, and resisting.

And, given that it's quite large, when we look at the supply chain capitalism, because we have to look at, miners, we have to look also at, unions So these, data labelers, they, have created also unions to protect like their labor, rights and we want to start by lead, like step by step and in September, October, we are gonna organize a gathering with critical scholars have done like research on data centers and activists, activists from Mexico, Chile, Spain, the uk because I don't know if that, but in the UK there is also a grassroots organization protesting against a data center in, east London, h harboring, hovering.

Yeah. so we are gonna organize this event that we are gonna bring all these different organizations together, because we want to put like academics in touch with, activists and people like resisting this infrastructure, in order to, yeah, to bring everyone together and have like a discussion about the impacts of, of This. Fantastic and that's in the autumn? Yeah. That's happening in, Yeah. In autumn.

Yeah. I wanna know about that. Mm-Hmm. I have that. Yeah.

I was also gonna ask you, you've been in Mexico, you've been in Chile, it that presumably is because your Spanish language access, so that ne that isn't necessarily representing like where in the world the, the data centers or the communities are engaging with this, that that's because you are, you are picking those communities.

Yeah. For, for sake. Exactly.

Because for me it was easier to, yeah.

Access the, the communities and also like it was my first time doing field work, by myself because I don't feel work prefer on, migration with like, migrant scholars.

I learned from, from them and that was my first time doing that alone.

So I was like, let's do it in my model tone.

Let language so that I'm Yeah, Fair enough. Yeah and yeah, No, that, that makes sense.

Yeah. Yeah, yeah.

Are we gonna find any more, any more thoughts or questions about this Absolutely. Fascinating topic to, to open our eyes to.

we'd like to hear more about no tech for tyrants as well, but yeah.

That, that all sounds amazing.

I mean, there's obviously this is an area that's of vital, vital importance Yeah.

For the, the whole future of all of us. So, yeah. Yeah.

People ask me like why I am not coding anymore because I dunno why in academia we have this idea that you have to be put into your own discipline and I've been trained as a mathematician on computer sciences, right? Mm-Hmm. Right. So I code algorithms I use like the cloud.

Mm-Hmm. so I use these data sensors, but given climate change, it's like I don't find motivation anymore.

like by coding, right? I mean, I'm gonna code something.

I'm gonna be like, an algorithm and then what, so like why we don't look at how to critically engage with infrastructure of, digital infrastructure.

So I stop coding, I code a bit, but not anymore.

because I miss motivation and yeah, I'm now doing this more ethnographic patch-work.

That's what all the best anthropology is, is coming outta some other discipline and doing an interface with the, you can see things that, that kind of bother that a trained anthropologist won't necessarily do.

So anthropologists will always come from somewhere else, basically.

Interesting. So, yeah. That, that works. okay.

I think we better say thank you to Anna for absolutely fascinating and revealing talk.

Thank you so much for coming to talk tonight, and thanks to the audience here.

The Ted K Archive

Ana Valdivia

The supply chain capitalism of AI (Seminar)
A call to (re)think algorithmic harms and resistance
30 April, 2024

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