**Ethics and Technology**

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TRANSCRIPT

0:00 It's really great to be with you. I’m sorry I was not able to be there with you physically. As you explained, we are in a really tough situation here. Our everyday lives are completely changed. We spent four months blocking the universities, organizing some big with rallies and trying to fight against corruption and the overall situation in Serbia, so basically I live in a parallel universe here. It is really hard to explain.

0:46 But I’m really grateful that you invited me to speak and luckily I will not speak about the protests. Thank you a lot for the support and for your kind words. I will try to speak more about the investigations that we did in the past and maybe at the end I will try to wrap up with some idea, and maybe in a Q&A if somebody is interested to know more about the local situation, the student movement, I’m also really happy to discuss that.

1:27 I'm going to share my screen. It's usually a really messy screen. I'm basically a counter cartographer, but I’m also a fellow designer. I started as a student of design but basically now for more than 20 years I’m working at the University in the field of new media. All those investigations that I will show you today really didn't start from there. It didn’t start from this, I didn't have an idea that I am doing this as a designer, I never had an idea I'm creating some kind of design object or even art object with these.

2:15 How I started with these investigations was with a basic curiosity. And it started with one map that I created and most of the time I am starting my presentation with this one. And this is the map I created more than ten, eleven, twelve years and this map is basically some kind of is the starting point for me.

2:56 We were like investigating some cases of cyber-attacks on journalists and independent media in Serbia back then. I was working with a cyber forensic back then and so we collected some data and it was really like into some kind of investigations. I had like feeling that we were working like some kind of detectives but in the field of cyberspace.

3:29 I started to work in this because I wanted to understand this environment we are working in. I started to work on these kind of investigations into different internet service providers and different internet networks in Serbia. And this was the first drawing that I made and I was really happy with it. I love it, it’s still really beautiful.

3:49 But in a way the questions I got from here is what is the meaning of all those things and basically how I can read all those relations and what kind of power relations exist there? Because I knew from this kind of investigation that each of those dots here in this drawing have certain powers to block, powers to filter, powers to surveil, different forms of powers that are basically hidden in every router that I was investigating. So I started with this question. What kind of power relation exists here and who controls all of those spaces, and how I can read this cartography?

4:37 And this is how I engage and this was may be 10 years or more long process of investigating different layers, invisible layers behind the screen. It started with this one and after a few years I landed up here. We spent almost a year investigating Facebook algorithms.

 5:08 I wanted to understand how this factory works because I became really engaged not just on this idea of just investigation of algorithms, but I wanted to understand the factory. Back then in 2014 I think, 15, 16, I was like, how do these things really work and who is doing the labour? What is the resource here? We see on Facebook and any platforms we have a huge accumulation of wealth but the factory is basically invisible.

5:53 So, I started to draw this map which is called the Facebook algorithmic factory and we engage in some kind of investigation of all the resources and data they are collecting. Then we were reverse engineering some processes. Then we found like 5000 different publicly available patents that we can read. We basically tried to draw this mosaic of unknown things that exist there. Unknown processes. In order to have a big map that should explain some kind of flow of information from one point to another and what kind of algorithms are being used.

6:39 That was even before this term algorithmic transparency became popular. It was a crazy experience working on this and I, but the thing is if you do this kind of stuff you really need to have a lot of time, and this is something I realised in the beginning that for each of those maps I'm going to make I will need minimum 1, 2, 3,4 years. Nobody is going to pay for that. It doesn't work like that. So I said this is something I do just for myself to explain to myself and I don't care to write any projects about it, I don’t care to apply for some funding.

7:26 I just want to be free and to do this as my hobby, but it was never a hobby because it was taking me, because it was so exciting, it was taking me 8 hours a day to do this kind of stuff. I ended up with this format of big maps. This is the moment when those big maps started to be treated as design pieces or art pieces, because they started to go around in exhibitions, museums.

8:00 But, for me, it was never like this. For me, this was just a blueprint to understand how this invisible factory, how one of those tens or hundreds of different invisible layers of hidden behind our screens is basically functioning. For me this is still a blueprint, and why this is called counter cartography because it doesn't come from the position of power.

8:32 I am somebody who is outside of this factory who doesn't have access to this factory and I'm trying to understand and investigate. It is like countering the position of power because most of the maps are being created from the position of power. This is my company. This is my empire. This is my whatever. This is the kind of counter approach to that.

9:00 Trying to map something from the position of not being part of the power. But it is also something of a utopian idea because for example, for this research we spent one year or even more doing it. All of those things inside of those servers, inside of those machines, are changing on the level of one second and being fine tuned.

9:28 In a way it’s some kind of utopian idea about transparency or algorithmic transparency that we will ever be able to have this kind of final picture of how this system really looks like.

9:45 And then another problem, it’s like ok, even if we have this idea how all those algorithms are being connected and how this is really working, we will need years or maybe decades or hundreds of years to understand what is the impact of those systems on society.

10:01 But I'm still trying to believe in this utopian idea of, we need to have a picture of those systems because those systems are shaping our world, our relations, our information streams. For the beginning we should understand how this is working. But then after this investigation it started to be even more crazy with this map that I really loved and I still love it.

10:32 It's called anatomy of an AI system. This map explains one device, back then it was popular, this Amazon Echo device and I wanted to understand this kind of real anatomy, how this system looks like. It's not just about this stupid cylinder that sits in your room. There is a huge planetary scale system behind it. Together with Kate Crawford I went into this investigation of how to understand what is part of this planetary scale system and how this really works.

11:13 When if think all of this middle of this map that starts with the user and object that we have in our room, extends through networks, to different types of data centres, behind data centres you have algorithms, behind algorithms you have labour or datasets or training process and so on.

11:44 And then if you go like this there is never end, if you really go further and further, because there is always something behind. If you go behind the dataset there is some work, behind this work there is somebody who choose what is dataset, there are pictures that are coming from somewhere or a book that is being part of the dataset is written in the 15th century.

There is never an end of this road. There is some kind of dimensional space in which you can extend your investigation in one direction but even here, so for example, you go and you can start to investigate the first router in the room, this router has 2 cables, one is data, so you go into data to this investigation and it never ends. But there is another cable.

12:36 If you go towards the electricity cable you will end up in another process that will end up in another complexity and you will end up at the end in some coal mine in Serbia for example. I started to log this multidimensionality of it and this map is all of those years of investigations of how I can go deeper and deeper through those layers.

13:10 But then this map exploded in two different sides. The birth and life and death of one device and then from that perspective we create, we started from the elements, from the earth and started to follow this transformation of elements into the infrastructure. Then it is completely different universe.

13:36 It is a completely different story. Then you speak about another form of complexity, another form of obscurity, that is the supply chains. All those rare earth elements. Basically this maps kind of like drawing this discussion, and became, again part of a museum collection, galleries, art scenes or whatever. But it created some kind of joint discussion of what infrastructure, data, data flow and whatever, with nature, with exploitation of nature.

14:15 What we see here, it’s a map of different forms of planetary scale structures, but you also see the planetary scale exploitation of earth, exploitation of human labour and exploitation of data.

14: 31 And then after this one it went even more deeper into, and this is really some kind of Covid time, let’s say, madness that ended up in 4 years of investigation, four years of mapping, that we spend basically 4 years in one map trying to do this one. This one is called calculating empires.

15:03 This is not an anatomy of an AI, but about its about understanding those planetary scale systems. This is about like history of planetary scale systems and history power. So the full title is Calculating Empires, A genealogy of Technology and Power Since 1500s. It is about the relation between power and technology through 500 years.

15:33 This is really a big map so it's starting with investigation of communication devices, then interfaces, and basically follows the same logic of anatomy of an AI going deeper, deeper and deeper. Behind interfaces you have communication infrastructure, behind it you have data organisation, behind this you have algorithms, models, hardware, computing systems, but then this is the half of the map. Another half of the map is basically sorting forms of control and classification during 500 years.

16:28 This is extremely deep and detailed investigation but what I would like to speak here since this is more on the side of design technology, is about language. What you see here is basically some kind of combination of different, so basically once you start to make a map you are defining some kind of language.

17:02 The language here that we use is basically a combination of some kind of punctual data but also forms of instruction and visualisations and different kinds of storytelling methods. Sometimes it is a text, sometimes it’s illustrative or photo. Building here some kind of mix of all of those media into one, and what I really like is it is kind of more, once you go into this more abstract representation of relations and powers you are giving people different ways to read this, to navigate this.

17:49 In a way at the end this kind of map looks really, let me show you how it looks in the gallery space. We are building some kind of structures that you go into and then you immerse in this kind of like, I think for me it's a kind of n-dimensional storytelling space. What I like about this is it is kind of breaking this fear of speaking about history because once you start to speak about history you are doomed. You are always wrong.

18:33 But here we are doing some kind of critical reinterpretation of history in our own way. I am really clear with this idea that it is the same like a dataset. It cannot be unbiased. Every kind of story you tell about history or about the present is always biased. But in a way, here we are using it as a possibility to speak about history in a different way, but also to take time.

19:09 I think what is really radical in this thing, is you cannot consume this in 2 minutes or 5 minutes. You need to engage with it. You need to spend a lot of time, you need to explore. And then it is also like some kind of non-linear story as well. So it depends what is your prior knowledge of things. You can explore this map in many ways. You can jump from one part of the map to another and so on. This is the place where we are now with this investigation.

19:47 This is something I really enjoyed. I really enjoyed all those last 10, 15 years in this completely immersive investigation of reality. Investigation of technology. It was a really big part of these systems that are ruling our lives or moderating our lives are completely not visible. What I really enjoyed in doing this is this combination of investigation, design, art, everything packed into one thing. It is a weird space to be in. It is really exhausting sometimes.

20:42 It is also really rewarding, all of those spaces in between in which you have not, you know, it’s hard to label what you do and how you do it, is it art or design or social science, I really love that. So I hope I gave you a bit of inspiration to find your own completely crazy trajectory of investigation, of design, of art or whatever you're doing in your life. Thank you.