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□ So here we are, in the bunker, talking about algorithms. I don't know if you guys had the chance to give a thought about what are we doing here and what does it mean to be in a bunker talking about algorithms while, at the same time, a cloud of white smoke is popping out at the Central Pavilion, where the collective show is happening... And then some questions – of course no answers – came to my mind, because I think the work is extremely layered and very interesting – but some questions came to my mind and I'd like to start sharing these questions with you and then we build from here.

I mean, here's the bunker. What is this bunker? Is this bunker a metaphor for a machine? Is this bunker a computational machine? Are we inside the belly of the beast? Are we, by any chance, the last human beings who survived inside the machine? And is it possible, while being inside this machine, let's say, to change the shape of the machine? To change the shape of the bunker with our voices the same way that wind is carving stones? The same way, for example, human language is changing the morphology of vocal cords in relation to the phonetics of the language that each of us talk...

And what's the relation between the bunker – the heaviness, the concreteness, the underground nature of the bunker – and the cloud. Are we sonifying the bunker, indeed, the computational machine? And is the cloud of smoke, outside, re-spatializing our sounds, our conversation? And isn't this something that has to do with a change of state in the same way that physics talk about? From the concreteness of cement to the ephemerality and to the ethereal nature of this cloud. And isn't the cloud itself, indeed, a metaphor for the computational cloud?

So these were some of the things that I was sort of having fun with while waiting for you guys. And of course, the relation between the bunker and the cloud can be read as the relation between hardware and software. And indeed, what about us humans interfacing these two dimensions and the changing states between the two? And can we politically articulate these two dimensions? I mean, can we resist and can we use algorithms for political aims – that's one of the things that interests me the most.

I've been spending the last 10 years of my life doing a sort of nomadic work in some of the weirdest regions of the world and during some of the most convoluted and bizarre and dangerous events of recent history, from the revolution in Iran in 2009 to all over the Middle East during the Arab Spring and then in Fukushima during the nuclear disaster and then the Umbrella Revolution, and at the borders between countries, and so on, so forth. And I've been trying to do this work because I did believe that it was possible to use technologies to approach these events and to investigate the role they played in shaping the political agencies of the people that were involved in those events.

This practice is something like a performative approach to cinema, a cinema becoming a life-form, if you want. And also, a form of video squatting.

A way to squat places where, usually, it is not possible to do or record anything, for example while crossing sensitive borders. The concept of border, indeed, on which part of my practice is grounded... what about the idea of borders and the idea of algorithms, I think that it might be interesting to think them together. I mean aren't algorithms, designing borders in the online space as much as borders offline are designing the structure of the world that we inhabit...

And when I was performing borders, I was very much interested in a specific zone, which is actually in between countries... Indeed, in between borders. I mean, actually, countries never border each other, physically. There's always a pillow area, like a buffering zone that you have to cross. And then this zone is a zone where, technically speaking, there's no jurisdiction of a country's law over another. I mean, it's really a no-law land. And that's why, at least that's how I see it, it's a gated space. That's why you only transit, you don't stay. And that's why, of course, you are not supposed to do anything creative over there.

I say this because the concept of *conurbation*, which is a concept coming from a French philosopher, Jean-François Lyotard, is a concept that, to me, points at this buffering zone in between borders. And my question, and I'm coming to the point that I'm trying to make, my point is – where is the buffering zone, the *conurbation* of algorithms? For Jean-François Lyotard, *conurbation* was the moment in which, when you're tuning radio and you can't catch the right frequency... There's an anecdote. He was in California at that time. He was traveling in a car, and he couldn't tune his radio properly and only noises were coming out because he couldn't catch the right radio wave. C*onurbation* is a way to talk about borders in a liquid, amorphous sense. And it is, in a way, an attempt to re-articulate the notion of borders in an emancipatory way. Not as something frozen and stiff, very much in the same way we are used to thinking about algorithms. Algorithms are used to datafy, to profile people. That's how we are constantly violated, if you want. Where is the buffering zone of algorithms? That's one of the questions that I was trying to think about today. Is there a buffering zone for algorithms? And this idea of buffering zone and *conurbation* made me think also about the relation between the cloud hanging over the pavilion, the cloud of white smoke, and the idea of breathing. Isn't the cloud a manifestation of our conversation? And isn't our conversation, a form of breathing? And what's the relation between breathing and algorithms?

I'm saying this because I'm working with Franco "Bifo" Berardi on a movie project around the notion of breathing. His last book, just published last January, is called *Breathing*. And the attempt that Bifo does in his book is that of trying to think breathing, and indeed rhythm – I'm saying this because I know there are some musicians here – breathing and rhythm as political categories. And indeed, the idea is also that of looking at the history of social movements and at the history of uprisings and revolutions as the attempt of... Well, not to be technical, but of the general intellect to give itself a body. And giving itself a body means giving itself a breath. A breath which is de-synchronized from the mechanized breathing coming out from what we called, in the conversation we had recently, the iron lung which is the algorithmic breathing, which is co-opting the organic breathing.

It's a metaphor, obviously, but you see, I think it's a rich metaphor. And how is it possible to get rid of the iron lung of the computational abstract machine? Is it even possible and is it possible to do so by highlighting and finding the buffering space, the *conurbation*, between these algorithms, and can we tweak them starting from this place? A place which I don't know where it is located and not even if it exists. Please, any time, from now, jump in if you feel like.

One of the main issues, I think, in relation to some of these concepts I'm throwing here, is the relation between algorithms and differences. Personally, I do believe that the main problem with the way that algorithms are designed today is that algorithms are promoting identity and are based on the principle of identity instead of being based on the principle of difference and instead of promoting differences, promoting diversification, promoting bifurcation instead of... And we see this very well in the way that datasets for artificial intelligence are built. I mean, Pasquinelli says that very well. It's statistical induction, it's averaging. Really, it's algorithms against difference instead of algorithms to promote differences.

O Do you think that every algorithm works like that? I mean, aren't you categorizing algorithms just as those computer technologies that make profiles of people on the internet for economical, political reasons? I mean, algorithms are pretty much everywhere. And the first note I would like to put forward is that it seems to create a difference between a human being and algorithms which is, from my point of view, not entirely correct, because human beings have chemical, biological algorithms called DNA and RNA. And that's a self-replicating algorithm, which is so working well that created evolution from small cells or beings in the sea to the whole life you can see on the earth. It's so coming from the same algorithm which mutated many, many, many times and created diversification.

So my first point to your pitch would be to say, are we different from algorithms or we are, indeed, algorithms? Because I think that we are. And the fact that we create algorithms... Algorithms are basically the way we solve problems. Anything you want to solve to calculate some kind of data from a physical phenomena, you need algorithms to do the job because, of course, you cannot handle all the other numbers. And algorithms, of course, they're also to save your life on a daily basis. For example, nowadays, the technology with nuclear medicine uses sophisticated algorithms that literally paintbrush tumors inside the brain with protons. And that's a huge deal of algorithms working.

So is this just about bad algorithms? And what are bad algorithms? And why we are facing those algorithms? Before leaving the words to my colleague here, I will add that many of the topics that we are going to talk about today are object of scientific research of the European Commission. And I'm talking about what they call the digital transformation. Sooner or later, we will face a world where everybody will have the DNA analyzed. And that's good because we will heal a lot of diseases studying many, many DNAs from people. But of course, that could be also a downside on this, that we will be controlled by algorithms.

For example, algorithms are used in jails in Europe and the United States. Some algorithms say, if you are a black man, there are some percent probabilities that you will reiterate the offense. And that's a bias in the algorithm. Another algorithm will say, if a person lives in a certain point of a city, he will not get alone because he probably lives in a black population. So another example of bias in algorithms, but algorithms are not just that. I mean, are not just Facebook, are not just corporations or nations because what we face in the future with digital transformation are two big paradigms. The first is Chinese, which is national control by algorithm. And the second one is American, which is corporation control by algorithms. In all these two big contradictions, there is no space for democracy at all. But again, there are good algorithms and we are algorithms, too. So where do we go now with this knowledge?

✱ I would expand because I wouldn't want to put an adjective of good or bad algorithms. But in fact I think that yes on one hand we are organisms, we have genes, our genes are programmed to recreate themselves and expand and they will do anything they can to do this. And in a similar way, they will push so that this happens in a bad or in a good way. It doesn't really matter. This goes beyond the concept of what we think is good or bad. It's far away from the morality or ethics.

O Yeah, yeah, yeah.

✱ So to put it in kind of a wider scope, algorithms are part of a system. Now, how we are developing and how we organically move within these systems is actually beyond this. Maybe one of the other topics that I read we could talk about, that was in the string and that is probably part of this cloud, is polarization and it is something, Mitra, you were mentioning, something about identity. And yes when we talk about, let's say, just to pass the word "bad algorithms" it is because, for our concept or at least for mine as an artist, when I see Facebook or anything of the big corporations, Google, whatever, we are promoting a lot of identity. We are promoting identity in a period where borders seem to be not so liquid, whilst your identity is very liquified. So you're not defined anymore so specifically by a function that could be your job, a family, your role in a family (families are changing, the role is changing, the economies are changing and the economies are changing worldwide).

And actually, algorithms are being used, as you were saying, for biased profiling. You do this, for example, in airports. To study the best way for somebody to buy something, there are algorithms that can tell you, "Put the coffee place on the right-hand side, 10 doors away from the next gate," because for sure, by studying the way people move, you can make them do things. So if you put a publicity here to the left and the coffee place to the right, everybody will go towards the coffee place and nobody will see the publicity. And one would think, "Oh, that's against publicity because you're not publicizing," but in fact, it's working for the coffee place. And this is an algorithm that says, "Okay, you go in. You don't go left. You can go left or right. If you go left, you check my advertisement. If you go right, you go and buy coffee. If you go straight, you go and take your airplane." Problem solved.

And that is to go back to what you were saying about algorithms are a way to solve problems. Many years ago, many artists and activists thought, "Yes, let's use these algorithms. Let's take computers and algorithms and power of processing data in places where there seems to be less of this capacity, especially in the southern parts of the world." And there was this big belief that we could actually make a huge change and I think that, for a large period of time, this was happening. But I think then there was some sort of a trauma or the polarization, so the fact that you have these big corporations dominating with these type of platforms of social media put not the algorithms, but this way of using internet or platforms for communicating, I think it pushed it to a way that we became, also, non-sensitive about it and less critic about it. I mean, I think everybody uses one of these big things here, like Facebook, I guess. No? I don't use it, but I see it more and more. If you're talking about the bad algorithm, this could be one of the bad ones, but why is it really bad? It's a question. I'm not saying it's good.

/ I think this idea, like good and bad algorithms that you raised, is really relevant to talk about because it's true that, especially when it comes to critical digital media purchase, we are very much... we have in mind, when we hear the word algorithm, we have in mind corporations, mostly. Especially after the Cambridge Analitica scandal and what Facebook has done and all this facial recognition that is happening right now, airport security, surveillance. So this is the reason why we are leaning towards picturing the algorithm as something really bad. But as you rightly point out, we are also made of instructions, right? DNA, RNA are instructions that we have in our cells that... I guess, the difference is, though, that we do have free will. So it's a combination of a preset string of information which we have in our DNA, RNA, and a combination of these together with our free will.

And I think the point of agency is the, really, focal point that we do not see when it comes to algorithm because the way in which we see algorithms, usually, is by removing any trace of agency from them. But in fact, the algorithms are designed by humans in the end. So it's a set of instructions that is configured and mastered by a human being. So in the end, there is free will in the design of the algorithm.

O Yes. Well, there are many good algorithms that keep you safe every day and you don't have any control on them, but you trust the people that do these algorithms. So it's a matter of trusting who and why. Whenever you talk about corporation algorithm, you must take into account the fact that, first, these algorithms are patent protected. So there are laws protecting the secrecy of these algorithms. And the second is that, because these are patent protected, there are a lot of lawyers that will fight to protect them and to keep them secret.

But what happens if an algorithm of corporation become so important and so vital to the life of society in the 21st century? What happens with this kind of algorithms? Because the point is that one can make a mistake. I can write an algorithm and I can make a mistake, a mathematical mistake, and then some people suffer for this.

On the other way, I could be not a very good person or I could do some biasing because I'm racist and so write an algorithm that punishes black people in some way or another. And that's a different thing. So there are algorithms that are bad not because they are intrinsically bad, but because they are badly programmed, because there are mistakes and men make mistakes every day. It's part of our way to learn.

On the other hand, there are algorithms that are biased because there is a reason, a political reason or a sociological reason, an economical reason, of course. And one of the striking revelation I had this year working with European Commission is that they consider the great internet corporations much more powerful than nations. So we talked about borders many times in this year, borders between nations, but the real problem is that we are not looking at the right direction because nations are something that is not going to stay forever. We have a revolution happening right now, which is in no space. It's not a physical space. It's a different kind of space and, still, nobody has rules for this kind of space. So the problem with algorithms is control. Who controls the algorithm? Who verifies the good or bad algorithm? Because many times algorithms save our life.

/ Yeah. I'd like to raise a point on this very note that you are talking about, which is, okay, you're talking about corporations being more powerful than nations, which is probably the case. And you talk about space. So this situation is erasing borders, so probably the question that Mitra has raised is no longer of any sense because borders...

But, yeah. I think what you are addressing is a question of legal borders. So because the European Commission and not even the US Congress, as we have seen again in the case of Zuckerberg testimony, they are no longer able to impose rules on these big giants.

O They don't.

/ Yeah. But I'd like to raise the issue that, okay, maybe there is no such thing as a legal space to regulate these corporations. However, I would like to point out that we are talking about materiality, in the end. I mean, algorithms, the fact that there is here a cloud that is steaming, it's a really important thing because it's hinting to the fact that, even this discussion, like algorithms and codes that seem to be transparent and not based in any place, in fact, they are based in warehouses. And most likely, there are people like digital slaves, or underpaid labor, most likely living in non-western countries that are exploited by corporations in order to do digital work. Right?

And also so there is labor. So this is a word that I would like to throw on the table because algorithm risks to be, as a word, too transparent, too light, too ideologically light, actually.

O Yeah, yeah, yeah.

/ But I do think that we should point out the labor dimension, the materiality of this corporation. The fact that there is not just people working for content moderation that we tend to erase. We tend to get these people out of the picture and we tend to highlight just the role that algorithms have when it comes to content moderation but, in fact, there are real people, underpaid people that do work in content moderation. But also, the fact that the cloud is based somewhere, it's not really a cloud that exists in the sky. It exists, most likely, in a place that has been disrupted when it comes to environment. So this cloud is actually generating a catastrophe when it comes to our planet. So I would like to juxtapose the word algorithm with the word labor and materiality.

* Yeah. And I would add that you're talking very rightfully about the cloud, that the talk we are doing now is in a bunker. We're in a bunker. It wasn't many years ago that, I think this thing was conceived. I mean, there are still wars happening in all the world and I think this is the real materiality. There could be a time where we could be speaking by ourselves without a microphone and not being streamed, and we would just be here. And this is to get back to the point that Mitra was saying at the beginning. This is a heavy materiality. This is a condition where we are closed in this space, talking and it could be, ideally, in a moment where there's nothing else outside.

Plus, I've worked as an information technology manager, apart from being an artist for something like 18, 20 years or maybe more, I don't know, I forgot how old I am. I was once in a place where the whole data warehouse burnt and all the data of two very big companies were lost. And these two very big companies, which I will not say the name, one of them just disappeared just because they did not have any more all their client, customer information. That was something that shows how physical this immaterial world is, and it goes back to the labor because what happened is that, in India, this data warehouse got burnt, and I was in India with people working shifts of 24 hours, which is highly illegal for any type of world. Yes, there were no economical borders... well, there is a border but at the moment it's kind of flimsy.

/ Right. It was also recently out in the news, they're talking about this loss of data because we do consider data as being immaterial... So we mentioned the company Myspace, that now is kind of like old-fashioned social network or almost forgotten but there was a time where Myspace was the Facebook. So it was really important and many musicians, you are artists so you know this, have invested, have uploaded their artwork on Myspace. And recently, Myspace lost 10 years of data because there was a physical damage and they didn't have a backup.

So I think it's important and I like the fact that we are talking from the bunker because, in the end, this reminds us of the very condition of materiality and it's freezing, also.

O Yes, but the paradigm of data storage is totally different right now. I mean, the big data are... I don't know if you know something about big data, but big data is not stored anymore in that way.

We have multiple copies of database all over the world in different space and that's how it works. It's a huge space that can grow infinitely. It's based on multiple copies. And regarding labor, for sure, nowadays we have problems of slave labors also in technology, especially in production of technology. Not much like in the production of data, but in the production of physical objects like cellular phones and computers, of course. But a great deal of the jobs which have to do with database will be all computerized pretty much, because artificial intelligence will wipe out millions of jobs. So slave labor is just momentary.

/ Yeah, but this is problematic. My work is focused on Syria mostly, and recently, actually today, there was an article in *The Atlantic* that was addressing the fact that many Syrian activists... I'm pretty sure that you know that Syria is the most documented conflict in the world and people have died and faced jail in order to document the conflict in a visual way, in order to produce evidence. Right? So what happened is that most of the corporations, like the platforms where this visual data was stored by activists, most of the data has been removed. Not most, but many data which is digital evidence has disappeared.

And so many people who could be held accountable for war crimes and violations of human rights can no longer be accountable because when algorithms are taking a decision... So this is how I connect to your point. Yes, it's true that artificial intelligence is taking over humans. So it's true that a lot of algorithms now are doing the work that used to be done by digital, underpaid labor. However, this is problematic because algorithms and artificial intelligence do not understand context as much as humans. And sometimes, we do need humans to understand the situation.

So sometimes, they would flag content as violent just because there's something in the metadata that is violent. But how about people understanding the context? Understanding the reason why people, for example, do applaud destruction, blood, and death for the sake of holding people accountable. So I think the understanding of the context is quite relevant when it comes to crisis zone and it cannot be delegated.

O But I think that you are underestimating the computing power of today. I mean, what is happening in Syria is a very special case in which we have multiple nations fighting. So there are many secret services working there and I'm pretty sure that nobody makes a mistake there. They did it on purpose and they use algorithms just to hide behind algorithms, but those crime scenes are wiped out from the database because somebody wants to. And remember, you have multiple nations which are big, big, big empires. I mean, Russia and United States and not just them which are fighting each other right there.

And so I really doubt that there are mistakes from algorithms, but these things are proposed with intention. And regarding the fact that machines cannot see the context, I'm not sure anymore about this because artificial intelligence nowadays is pretty complicated and very sophisticated. There are engines for semantic computing.

So computers can understand languages and words and context in a perfect way. And I know that there are researches going on in the United States where they analyze... I think that they are doing the same in Europe. But anyway, in the United States they analyzed all the 400 million tweets every day and they can understand everything. The computer can understand everything because they are semantic computers.

□ Yeah. I'll try to bring some of these ideas together. It's interesting, I think, because we might have different positions, which is great for the conversation. But then I want really to address some of the things that made me think and also a little bothered me. Starting back from this idea of good/bad algorithms. I mean, to me, they're neither good or bad. Actually, they are both at the same time and that's what's been defined back in the days by Plato with the notion of *pharmaka*. And technology is *pharmaka*, which means it's both poison and cure. I mean, I want to point that out because I might be misunderstood or pushed towards a corner which I'm not really belonging to. I'm not a primitivist. I'm not against algorithms at all. I want algorithms. I mean, I need algorithms to move in Venice with my Google Maps. I get lost every three seconds, even with Google Maps. Just imagine without it.

So absolutely. We need algorithms and it's about, I think, use-value of algorithms. And then, of course, we need to think about data values and working conditions connected to data, which is also important to remind: algorithms are operating not only on the cloud, but on the materiality of humans' working conditions [mechanical turks, data cleaners], for example. But what I really want to say, is that I'm a little worried by the easiness with which we are associating human beings to algorithms. No, I don't believe so. I don't think human beings or anything organic is an algorithm. Although, there might be something similar to an algorithm, which is a string, in the case of DNA, of letters.

Let's have a conversation about this. Okay, maybe it's not algorithms. Let's say they are *ecorithms*. Right? And then they call it *ecorithms* because, they are algorithms somehow connected to an ecosystem. But then what's the real difference here... I'm specifically focusing on point of view in my theoretical research, and I'm actually doing research in relation to the differences between a phenomenological, organic understanding of the notion of point of view and orientation and what happens to this notion when it becomes machinic, when it becomes cinematic... And what happens to this notion when it becomes algorithmic... What's the meaning of an algorithmic point of view and what's the difference between an organic point of view and an algorithmic point of view such as the one produced by Generative Adversarial Network, which tries to replicate the phenomenological functioning of an organic point of view?

Okay. Do you have two points of view, there is a dialogue, if you want, metaphorically speaking, between points of view, sharing images, and then one says, "Yes, this is the real image," and then one keeps proposing images.

So the structure, the architecture of Generative Adversarial Network is really based, if you want, on a phenomenological notion and understanding of point of view [POV] and of subjectivity, but yet there is a difference. And the difference, to me, it's a difference in quality. It's not in quantity. And that's why, also, I don't believe that we can read everything. I mean, believing that by going through 40 million tweets a day we have a perfectly clear understanding of something... Otherwise, novelty wouldn't happen and that's why the algorithmic reference to the DNA, it's only partially true. Not to say, maybe false a bit because what happened with DNA is that DNA produces differences, besides the fact that there is the mystery of consciousness.

O That's a part of the algorithm. The difference is a part of the algorithm because the DNA is just a long string of instructions. Those instructions create proteins and the proteins have different functions in your body. And the DNA has also many other similarities to computer programming because it tells redundancy codes to correct itself. It works, indeed, like a digital information. And we must recognize that it's an operating system. It's a self-made operating system. It's a self evolved from biology, but it's an operating system. It works in many, many ways like computers.

And I mean, I've started machine language to program, bit by bit, computers. And then I started to use the DNA, and there are so striking similarities that you would think that there is a connection, but there isn't. The fact is that both systems are logical. They function. They work. And the DNA evolved in billions of years in the way it is now. It's difficult for me not to see the human machine is an algorithm.

□ But you remember, back then, I mean...

O Of course. Hold on, my last sentence.

□ Yeah. Of course.

O When you talk about DNA, you have also to take into account all the other things that make a human being because the DNA is just the operating system. What you fill inside the operating system, what you put inside your computer is just your experience and that's epigenetics. And that's all the...

□ Exactly, exactly.

O ... your history, your family, your friends, your language, your land, everything. Of course, a copy of myself in the DNA format is just a copy of my operating system, not of me.

□ Yeah. And the copy, itself, is never precise and they're always failing in a way because of epigenetics, because of experience, because of the *Umwelt* and so on and so forth.

○ But the DNA, itself, works as a multiple-layer algorithm. It's a very sophisticated one, but the way we produce enzymes and proteins, the way that we produce genes, the way that we evolve, it's all inside the code. It's all made to make us evolve. So this is why, I think, that it's impossible to detach ourselves from the algorithm because we are doing exactly what we are programmed for. We are programmed to create life. And because we are intelligence and we are the only species on this planet that can think about life and the universe and create science, create art, we are meant, in some ways or another, to use our technology to evolve ourself.

□ Yeah. The computational metaphor, obviously, and that's very common, inevitably, at this time. But wouldn't you be concerned by the fact that in the previous historical epoch we were comparing human beings to a vapor machine? And back then the metaphor was perfectly functioning for describing the function of the body because back then it was the epoch of industrialization and then everybody was convinced, "Yes, we work like a vapor machine".

○ But you should not confuse a metaphor with scientific data.

□ Right, but then it's even more scary because then what you're saying is you are scientifically convinced that we, as humans, are algorithms. This means not considering the free will and, most important, means not perceiving the presence of the body, I think, because then...

○ No, no. Of course, the free will, it's there and the body is there.

□ Yeah, but the free will is not coded habibi...

○ Do you have any kind of free will if you, in your genes, there is the alzheimer's gene? No, you don't have any kind of free will.

□ Free will is an emergent property that makes us different from algorithms. And this may be happening, and I want to introduce the topic of the body because also you mentioned this thing of...

✱ I think you are both going to a level which is very simplistic. I don't want to offend anyone, but you are forgetting the context. You are forgetting that we are multiple systems interacting with another system and we are within other systems that have other types of relationships. And we are in, let's say, these types of systems, we're rhizomic. So there are multiple inputs and multiple outputs of which we have not yet calculated or even seen what they are, what it is.

In nuclear physics, we are studying nuclear physics, we know, up to a certain point and we maybe know a little bit more about the astrophysics or cosmology, we are starting to know. We are in 1% or 0.000 something percent of what we could actually start to define.

So we are, I think, in this type of conversation, we are trying to define something that is really not definable and at the same time, there is a mix between human beings and the other concepts, If we want to define what a human being is, it's a complex machine. It's a complex system which interacts with other human beings and other forms of life and the universe.

Now, starting from there, why is it important that we emphasize on the algorithmic part of what this machine is, of what the human being is? And this is maybe what you were trying to... At the beginning, you said, "Why are we here talking about algorithms?" I think it's both interesting to understand that yes, there is an organic part of ourselves which is done, is coded, and is in this way, and then the world that we are creating, because we do create life, we create our own life and cognitively we are projecting something that is probably coming from within ourselves.

So in this, I kind of agree with Sancristoforo when he says, "Yeah, we are kind of coded to do this." Then, I don't know if it's free will. I don't know what it is, but I am very fond of any type of error because...

□ Exactly, Matias. But then, if we're focusing on the error part, that might be also an interesting point, then it's when the malfunctioning of whatever you're trying to call algorithm, which to me is not, that's when evolution happens. I mean, it's based on the dysfunction of the algorithm.

✱ Yeah, yeah. Of course.

□ Which is what you don't want to do. You don't want it to fail, right? DNA works when it fails, paradoxically. When it fails, you have evolution because you have a bifurcation which is unexpected. It's not coded because it's appearing in the relation of...

✱ Yeah, but that's what I'm saying. I'm not trying to define what it is. I'm not trying to define if we are... I think we are... Buckminster Fuller used to say we are verbs and we are not...

□ Verbs.

✱ Verbs, because a verb has a time in it. It's an evolution by itself, by definition. So we are something which is in continuous change and is changing and is modifying and we don't have the possibility, or we have a certain extent of possibility to predict what our evolution will be. Now, something which is very interesting that comes from algorithms: we were talking about machines, machine learning codes, and somebody mentioned artificial intelligence, is that we are in that point where we have to kind of decide. When you build, you build a train. A train derails. A train has 42 seats by wagon. You know something like 80 people could die. So do we build the train?

When we have an airplane, 180 people can die. What is the error of that plane? That, if it crashes, 180 people die. Then what is the error of the atomic bomb? So we're always facing this. What is the error or l'*accident* of this machine we're building? It's the constant thing a scientist has to face.

Now, we are programming machines to be able to program themselves. So we are creating lives that will actually be able to do their own thing, possibly. And Stephen Hawking was very against it.

O Pessimistic, yeah.

✱ Pessimistic and said, in a few years, we're gone, because we are very problematic, anyhow, as human beings. We're problematic in a one-to-one relationship.

O Yeah.

✱ Imagine we are irrational and illogical... I mean, we do create problems that, if you are a set of algorithms and you want to resolve a problem...

□ Get rid of the human.

/ We do create life or we do create death, also. I mean, it's not that we do create life only.

✱ Yes of course.

/ And also, I think it's deeply ideological, what you are saying. Because when you say that we are designed in a certain way and so...

O No, no. I didn't want to say we are designed.

/ No, but it looks like we are designed to produce this kind of technology whereas we could create life by doing something else. Right? So this is a historically-determined direction that we are choosing now because of certain circumstances. And so the fact that we are leaning towards thinking that this is the way we should evolve, it's ideological. This is not the only way we can evolve. There are so many other ways.

O We are doing it with technology.

/ Yeah, but we could do something else. It's not naturally, ontologically determined that we, as humans, we design technology and we do algorithmic stuff. Right? We could do agriculture...

O Hold on, hold on. The first civilizations...

/ We could do poetry, we could do something else. So the fact that...

O Yeah, but it's always technology.

/ No, no. I think the emphasis...

□ It's always technology Donatella, it's the relation between technology and *techne*, right? This is the issue. And then you can use technology in different ways. Donatella has a lot of experience in the Middle East, as I do. And there we've seen people using technology in an extremely emancipatory way. So we are not really against technology. Right? We're trying to define ... I mean, I think the point is entropy. I've led into the topic of entropy because then the difference between human-generated algorithms and biological algorithms is there, in a way. And if you follow the idea of Schrödinger, and I jump into this a bit, into physics and stuff...

O I don't want to be the cat.

□ No. Nobody wants to be the cat. Right?

O Especially because we are closed in here. So if that is the whole thing, let me out. In whatever state I am in, I just want to go out.

□ But biological algorithm, DNA, according to Schrödinger in this tiny book *What is Life*, they're anti-entropic. They resist entropy. So biology, organisms, they resist entropy. Why? Because they create fairly stable structures that resist entropy but also, to do so, produce entropy... That's the paradox and it's not well articulated in the book and that's the work we are doing in France with Bernard Stiegler right now.

The fact that as an organism, you are a meta-stable structure, that resists entropy, up to a certain degree. But to resist entropy and keep your order, well, you create a little entropy outside. At the same time, algorithmic technology is straightforwardly increasing entropy not because it's bad, because technology is *pharmaka*. It can be also very good. So the problem is context, if you want, it's a political issues. I don't think anybody here is against algorithms. The opposite. It's about use-value, again.

O But I don't understand the difference here. I mean, what do you mean? The technology is producing entropy and human beings resist entropy?

□ Yeah. I mean, not only human beings. Everything organic, everything biologically alive, according to Schrödinger and many other and especially Bernard Stiegler these days, biological organisms are ordered structures. And to keep meta-stable order is a form of resistance to entropy. While entropy is an excess of, or a generation of disorder. The paradox is that these biological forms of life, and especially when it comes to human beings and especially because of the use of technology... to keep our anti-entropy, we are increasing the entropy outside. And we are, right now, accelerating entropy.

Why? Because we are using technology not in a wise way. I mean, there would be other ways. And we have seen these ways. We have seen these ways in revolutionary contexts. We have seen people using algorithmic technologies, using the Internet, uploading images during uprisings and revolutions, and turning these technologies into something that is enhancing human agency, and if you want, reducing, in a sense, the entropy of the soul.

This is the issue of locality. Algorithms are not localized, in a way. A biological organism is always localized. And being localized, it means being part of a *niche* or *Umwelt*, if you want, a technological *niche* which is connected and shared with other animals, which are approaching the same space from a different niche. And these niches are reticulating with each other. I mean, algorithms, they don't have that locality. One of the main issues right now... and I want to throw this and maybe try to decline it from the point of view of your practices, if you want, because I think one of the most important topics these days is the topic of locality. Again, we are working on this issue in relation to entropy and algorithms in Paris, at the moment. And the issue of locality and algorithms is... Well, the issue of locality today is: why locality is conceived as a fascist concept these days? Because it's based on the idea of nation and the idea of identity politics is based on territory and language, for example. Right?

Now, if you look at biology again and if you look at sharing ecological *niches* and finding a metastable equilibrium between organisms and so on, well, it's exactly the opposite, in a way. How is it possible, indeed, to reinvent locality in an emancipatory way? Locality, when it comes to human being, is not only biological, and it is doubled by an algorithmic locality, which is not local, but instead delocalizes biological locality. And that's very clear when it comes to data profiling. You know, the data selfie are a digital, algorithmic form of *de-locality* which functions around the concept of identity instead of the concept of difference, which is at the base of biological locality and of its capacity of resisting entropy.

Biological locality exists because it’s based on difference and bifurcation. Biological locality gets de-localized by technologies, and that’s why there is the Anthropocene right now. Right?

○ It’s universal.

□ Sorry?

○ It’s universal. It’s not local.

□ Which one?

○ Diversification of life is universal, it’s not local.

□ Universal, I’m not quite sure, again. That’s maybe...

○ On Earth.

□ Well, on Earth, but the biosphere, itself, is a macro-locality composed by the differentiation of billions of micro-locality.

○ You would say that, also, Facebook is a locality.

□ Facebook is a locality based on the principle of identity, while the biosphere is a locality based on the principle of difference. And that's why algorithms increase entropy instead of reducing it, because we are using them not mimicking what biology does which, in a way, I would say that's what you would like or which is what you seem to push towards which is interesting and I would go for that. Donatella, how do you see the issue of locality? I mean, you've been seeing technology used locally and with good results. Do you feel like saying anything about that, for example?

/ I mean, I'd like to go back to politics, to be honest, because I think we are going too much...

✱ Can I say just one thing, then, which is very abstract again?

/ Before I go into politics, okay.

✱ Yeah, because the locality... and you were saying, okay, Facebook is about identity, but anything which is on the web is, for me, and I've done this through the practice of my work and my art is that this is a space/time concept. We were used to a linear concept of time. We are now in a phase where we are understanding this space/time as a concept, as a different way of understanding what our time and our space are together. So this issue of locality is very interesting because, as he was saying, yeah, Facebook is probably a local... You have your local profile. It's a local profile. It's your profile, which is everywhere and it is at any time. But your body is not. Your body is held in a physical place and your particles are united together, even if every day you have other types of space particles going through your body. So in the same way, you are your border and, at the same time, you are not. Your particles create some sort of border. Anyhow, that is going too far away.

○ Electric fields.

✱ Yeah. But this sense of what is local, what is global. What is at the same time, what is... This is very interesting because this is what we were trying to talk about algorithms, good algorithms and all that we said. And to go back to the politics, yes, I think anything which is local, we have to define what is local, but in a very broad sense I think it's a treasure nowadays. To have anything that you can define as local, you can treasure it. If you're able to define what is of this place we are here now, what is local of where we are now and what we can bring to show to someone...

It's a kind of a treasure and this is diversity. This diversity is a treasure because it's not based on a general form of identity. Let's put it this way.

□ Right. I leave you the word, but then insisting on this. Yeah, please.

✱ No, no. Go on.

□ No, because I totally agree and that's my point. But aren't we facing the fact that this beautiful idea of locality as diversity and as a treasure to keep, to preserve, to enhance, even more, to produce through more diversity, it's totally corrupted by fascism and it's turning into a conservative idea of locality based on identity and nationalism and so on, so forth.

✱ I absolutely agree.

□ And the question is, how can we turn locality back into this beautiful idea of diversity, which is where it originally belongs...

✱ I absolutely agree but, because we were talking in specific about the algorithm and went into this. For example – we were talking before – people don't read. We said very few people read or read books. I don't remember if we said it here or outside because my sense of space time is very weird.

/ That was outside. On the traghetto by the water.

✱ Okay. So it was a nicer place.

/ Nicer, yes.

✱ Yeah. So for example, what do you do when people don't read? You can't force them to read, but what I do is publish books because I think people don't read, you need books because it's easy. It's a very small algorithm, this one. But then I need to distribute the books. I need to make them available, but I try to do them in this way. Bottom up, local places. I identify these localities based on many different things, which is the connection and the relationships that you get through different types of identities. So through different types of people and I think that is politically per se. Per se, that is a political act to be able to produce and to show whatever you want to show.

Then another thing I wanted to say, as an example, I was once, I don't remember the photographer I was talking to – I've worked a lot with Israel and Palestine, I haven't been there, but I've worked many years with things related to it – at a certain point with a Roman photographer who told me, "I'm kind of tired of seeing people dead and showing dead people, because death is no longer anything. You see it everywhere. The spectacle has taken Thanatos made it a spectacle, and it's so obvious that nobody really gives a shit."

○ That's what Susan Sontag said.

✱ Susan, yeah. In fact, he was quoting Susan Sontag and it's actually in the photography book, but one photo is better than one thousand gigabytes of video sometimes. But sometimes, one thousand gigabytes of video can make a difference and not because of so much about what is the real content. It's more about squatting I think this is what your practice is. Sometimes we... yeah, yeah.

□ Squatting, if you want. Yeah, squatting and taking space. Yeah, yeah.

✱ Taking space for a certain amount of time, that can be so disruptive and it really doesn't matter how good the whole video is. It's more about having this disruption and this interfering in this line, in this space time.

□ And creating an offering, if you want. Right?

✱ Yes.

□ I think the space of your...

✱ So you're creating your autonomous zone for one moment. You're breaking the space time in that moment and you're making your own local space time which is, by default, a disruption because nowadays if you disrupt what is a script, because like you were saying, the governments, all the secret services etc. If you break the script, if you break their script, it's not true, I don't believe that we are doomed, that we will be always governed by terrible governments and bad people because if I did think like this, I would probably leave for another planet. Sorry.

/ If you can find an exit.

✱ Yes.

□ That's what the bad people want to do, anyway. Bad people are planning this.

✱ Exactly. Because they're clever and they have money.

/ No, no. Going back to politics because I like the fact that we maybe end up on a political note. I don't know. You decide. I don't want to suggest that I am the last one, I just want to throw the word politics on the table because, of course, the discussion about algorithms is definitely a political discussion very much. Also, because you are talking about locality, local, global, and because I worked in the Middle East for many years and I had the chance to witness 2011, which I would like to remind that was a very lucky, blessed moment in which the local intersected, in fact, and connected to the global. I mean, there were uprisings pretty much everywhere in the world.

So maybe you remember 2011 as the year of the Arab Spring, but this is not just the Arab Spring. There was indignados, Greece, Italy, everywhere. There was a moment in which politics was really global.

It was acted local in different places, such as from Syria to Greece, but also there was this connection that was clear, also because of social networks and because of technology.

So I think that, back in 2011, what we saw was this political use of technology and I think that, unfortunately, the Arab Spring did function as a laboratory for power to study the use of technology.

O Absolutely.

/ And this is really the problem. With the restrictions that we have today, 2011 could not happen. And this is what we should think about because, since then, there's been a backlash from political powers, from corporations, because they saw that people were using technology to make a change. And after that, a set of restrictions were implemented in order not to make another 2011 happen.

O Can I make a question to you? I totally agree with you with this, but I would like to make the devil's advocate for one second.

/ Sure.

O What makes you think that those spontaneous revolutions were not instead engineered with the use of technology? Because that's the work of the devil.

/ Yeah.

O To make people believe that something doesn't exist.

/ Okay, right. My practice, I am an ethnographer. So I don't talk about theory. I study the field. And I used to live in the Middle East and I do speak Arabic and I lived in the region for many years. So I am blessed enough to understand that the Arab people have an agency and not just because I was there occasionally. I mean, I spent 15 years of my life there. So I do think that what happened in the Middle East is the result of a very slow process that is historically determined after Sykes-Picot. So I mean, we are talking about decades and decades. So no, I don't believe in conspiracy theory. I don't believe that Facebook...

O No, no, no, no, no. I didn't want to...

/ ... came all of a sudden and...

O I didn't want to make a conspiracy. I'm just telling you that, if I see some ... I mean, look at Syria. If you have some people that is against the tyrant and you, in some ways, use technology to facilitate an uprising of the people, I'm not telling you that these totally engineered from scratch. I'm telling you that there is always a faction that doesn't like the tyrant, the president, the king, whatever.

You take the useful bunch of people which is against this and then you facilitate with technology some kind of uprising. And I'm not talking about Middle East because I'm not an expert at all. But for example, we have many others engineered coup d'etat all over the world in the last 70 years.

So what my fear is is that, in some ways, technology could be used the way you told. People connecting and be active and organizing themself against injustice and whatever. But what if we underestimate the fact that technology is not in the hands of people, really, but it is in the hands of corporations and nations which have top-level access to these technology that could be used in ways that we don't totally understand. I mean, are you taking in consideration this?

/ Of course. This is actually my point. My point is that, right now, 2011 could not happen because there are frictions that have become crazy. There is friction being put on technology by the corporations themselves and by governments which are not the same that we had in 2011. In 2011, the situation was much more open. There were more flows that have unfortunately...

O That was not regulated at all.

/ It was not regulated, exactly.

O But what is telling you that... I mean, we are regulating the internet right now.

/ Yes, definitely. I mean, we are talking about 8 years after.

O What is, in your opinion, the reason behind this regulation? And the question is sincere. It's not provocative. Because, in some ways, I believe that probably we want more control. They want more control. Somebody wants it. Who has power wants control, of course. But on the other way, they probably are also doing this to protect, because what do you know about another nation putting the fingers inside the social life of another nation to change the political life of the station or whatever? Look at the United States and America and China fight themself in cyber space every fucking day.

/ Right.

O And they are tackling inside the politics of the other nations, doing this every day. So the regulations probably are there not just only because who has power wants total power over people, but they are probably trying to protect the citizens from other nations.

/ I think the powers that be are trying to protect the powers that be. So they are trying to protect the status quo. For me, 2011 was a way to hint at the fact that technology can be used for political change. When this is restricted to a region that has been disrupted for years and object of colonial powers fight, such as the Middle East, then it's fine. In fact, if you go back to 2011, the narrative which you find in western media is that, oh, this is the Arab Spring. It's amazing and people are...

O The Facebook revolution.

/ Yeah, the Facebook revolution.

O The Twitter Revolution.

/ So why there was this ideological readings? Because of course, it's in the interest of our so-called democracies that a place such as the Middle East liberates itself without blood and without sending tanks and bombs and whatever. But after they saw that change, especially change in a region that has been so much under control, needs time and needs, unfortunately, blood and also does generate violence and also touches this political change that was in the making in 2011, also touched neocolonial interest. Then there was a backlash. So of course, now the situation is... Middle East was used as a laboratory to implement control and surveillance on technology because it was fine when technology was liberating the Middle East, but it's no longer fine when technology is used for political change in here. And so the more conservative regimes fear that technology can give too much power to citizens and put corporations, for example, at risk. That's totally legit and I understand it and I agree, but my question is another one then. What makes you think that people is always on the right side?

/ Oh, no. That's for sure not the case, but...

O I mean, we know that the worst scenario is in Europe.

/ You're absolutely right, but what makes you think that Zuckerberg...

O I don't know.

/ ... knows how to regulate us or China or...

O He isn't able. As a matter of fact, he went... I don't know if you saw the interview he gave at the European Commission, but it was really put in a bad situation because the European Commission has enough of this and they called them band-aids. And there is a reason, because these people sell data for really nasty reasons, which are totally political. I mean, Facebook is a political medium. We know it and we cannot deny it. It's used by the United States for political reasons and that's why China doesn't have Facebook and that's why Russia doesn't have Facebook, because they know it's a political instrument.

And the fact that the European Commission put a lot of pressure on Facebook and all the others, I don't believe it is to create a state of control where we no longer have free speech, but we have to be very careful because this is a new kind of power we are facing for the first time. Because until the 1900, the power was the typical power of kings with armies. Okay? Nowadays, you don't need an army. You need very good programmers and very good servers and very good service to people.

So I'm not sure that every time that people uprise is right. Sometimes, people make very stupid choices. I mean, Nazi Germany was totally created by people, people that acted Hitler. It was not a coup d'etat. It was not engineered by anybody. You don't agree with that?

✱ Goebbels wrote some pretty interesting things on how he engineered the whole...

O Well, they were great marketing engineers. But, guys, the anti-Semitism was there much way before than Hitler.

✱ Yeah. Also...

O It was there since Martin Luther.

✱ Yeah, yeah. That's kind of... of course.

O Even Goethe was an anti-Semite. So it was there and people elected him. So I do not trust always the other people because people make wrong choices based on the belly. And you see...

/ Unfortunately, the controllers are in democracies elected by the people.

O Yeah, exactly.

/ This is a question of the head and the egg.

O I have an interesting question.

/ Who elected the politicians? Us.

O I have an interesting question for you and for you guys and then you can go on this way. For me, I have the sense that democracy is in a huge crisis. And maybe, I hope not, but I think that it will be replaced by something else which is not dictatorship, because it will be not persons giving orders, but it will be machines giving orders. And I tell you, again, the point is that we have to choose between the Chinese and the Americans, but the result is just like the saying. It's just a different face. The Chinese have these incredible technology of face recognition and whatever and I don't know if you know it, but the Chinese are sequencing all the DNA of the people. They sequence one full genome every 10 minutes and they have the biggest genetic laboratories in the world. All right?

And they are doing this for many reasons. One reason is that, if you know all the genetic codes, you could heal many different diseases and pretty efficiently. But on the other side, you have total control, of course. You don't have any more kind of privacy, whatever. But the technology was not invented by the Chinese.

The face recognition, the algorithms, the DNA, it was all US made. So we cannot fall in the joke, believing that we have the good guys and the bad guys. They are both bad and they have immense power. Only that we don't know exactly who has the power in the west.

/ But this is why I think you should not see it as a binary choice.

O No, no, no.

/ Whether the China model or US. I mean, we, as European...

O That's why Europe is important.

/ Exactly. You're talking about the European Commission. So let's wake up us, you know?

O Absolutely. Yes. That's why...

/ Because this can be the third way.

O Exactly. That's why Europe is so important. That's why nobody talks about Europe in a realistic way in newspapers and magazines. They don't tell what the Europe does for you, what are the researches they do, what they do to protect you. Because the real thing is that we are facing huge empires; India, China, United States, Russia, and Europe is just in the middle. And if we split in some many states governed by local fanaticism we end up crashed totally.

/ Yes, yes. This is the realism.

O We need a huge Europe, absolutely. I believe that.

/ Stronger.

O Stronger, absolutely.

/ But this is the reason why, also, there is... and this, I believe you're right when you talk about orchestrating something, that the fact the Brexit thing... This is definitely algorithmic led.

O Come on. The Brexit was definitely...

/ Yes. Because there is an interest there from other...

O Exactly.

/ Yes. In having a divided Europe. That's for sure.

O Yep.

/ Because they want us out of the game because we could propose a third model between those two models and ...

O You remember maybe some American official say, “Fuck Europe.” I mean, they want Europe out. Americans, let’s be clear. United States want Europe split. And Russia could be interested in the same because, if we are split, they can do whatever they want and they will do it with algorithms.

□ Exactly. And this sort of parochialism and nationalism and anti-politics is built through algorithms. At the same time, we’re not that much aware in Europe about this, I guess. Right? Because we’re focusing very much on the surface of this underlying process, which is, okay, fascism is rising again.

O Exactly.

□ And then we forget that, well, this is produced by technologies, up to a certain degree. Echo chambers and filter bubbles and stuff like that.

O Exactly. And there is, if you look at newspapers and TV news lines, nobody talks about Europe in a good way. They always talk about Europe when it’s about problems, not about what Europe does. Not a word. Do you know that one of the biggest scientific research centers of European Commission is 60 kilometers from Milan on Lake Maggiore? Nobody does. Do you know that it has... Well, except you, but nobody knows it has two nuclear power stations and one cyclotron and 1,600 scientists and 33 kilometers of streets and 400 laboratories. Nobody knows this. Why? Because the media are not interested in talking about Europe. They say, “Well, there are specialized magazines about Europe.”

/ It’s boring.

O It’s boring. And this is killing Europe because people don’t know anything about it. They are trying to cure cancer.

* It’s not very spectacular, Europe. It’s very... And it’s not so polarized.

O Politicians use Europe.

* Yeah, of course.

O National politicians use Europe to get votes because Europe is seen as this stranger commanding in your home, like the Starks are going to command the Lannister or something like that. Instead, the seven kingdoms all together make real power, not just one commanding the others. The problem is that we have this deficiency of communication in Europe, which is tearing apart Europe. Brexit was totally engineered.

□ Yeah, absolutely. Yeah. Guys, can I ask you, after this overview, or better this flux of consciousness, how do you guys use algorithms? Because I have the impression that you guys are working with algorithms. How do you, in light of what we just thought about, how do you work with algorithms? I would be happy to know because we just met...

✱ Well, I'm feeling really bad now that I use them.

□ No, because I am sure that you use them in a good way. Right? I want to know how, in practice.

✱ I'm also a programmer. So I use them to create programs and I do generative music and algorithmic composition. So that's electronic music. My aim, usually when I use algorithms in music, is to... Let's say you can create a pool of variables and these variables that you have in an algorithm are part of the instructions you give, so you would give an instruction to say, for example, then we are using some microphones now, pick up this sound, put it through a chain of events that I want, and then I could introduce, for example, multiple variables that come from something else and that would change the sound. And because I'm interested in creating this moment of something I do not know and I do not expect. And it's either an error. It could be an error, then the system could crash and it's okay, good, it's good for me. The system can have many outputs. And another way I use algorithms is to take data which is not relevant to the music, not relevant to sound, and to transform it and see how it can work with this type of data. For example, I'm doing this with some data which is relevant to the cosmology. So for example, take a planet's eccentricity, which is how it revolves in its axis, or, for example, how far it is from the moon, from the sun, in our galaxy, or how it relates to other planets, that data to transform it in numbers that change a type of sound that I am doing. I have actually one installation which is, ideally, infinite until there is electricity. But it's ideally infinite because the music that it produces consists of very simple oscillators, it's inside a cabin and it takes the data from the start and stars, planets, and the everyday time of earth and the rotation of earth. So it's basically creating... You can hear sounds that will be different every time you go there to visit this place. Obviously, for a human ear, the sound that you could hear on Monday, on Tuesday will be more or less the same, even if it is not. But it's a way for me to work on what is time and space, the concept of space and time.

○ Well, I must say, we have very similar stories. I work with algorithms on a daily basis. I program every day. And of course, I do also generative music. And the reasons why I do it are the same of you, because I like to be surprised somehow by the machines because... I'd like to point out that algorithms in music are very old, actually. And for what I can recall, the first algorithms were written in the 17th century by kind of Athanasius Kircher with the *Musurgia Universalis*, which was inspired by Jewish gematria, which means the Jewish permutation of letters, to create permutational music, permutated music. And you can find this in Mozart's work when he was young, doing the work for the *O Isis* for example. But Kircher was a real precursor of algorithms.

And I'd like also to say that music has a special relationship with technology which no other art has because electronic music was born right out of scientific instruments. So it's pretty natural that electronic musicians, sooner or later, start to tackle, to handle scientific instruments, scientific notions. Also because, of course, if you look the Middle Ages, the Quadrivium, music was alongside with mathematics, astronomy, and geometry because it's all the same. I mean, it's a time and space, and time-space in different declinations, but it's always very closed matter.

So to go into specifics, I work with my DNA, with my genome, and also with radioactivity. So I work with nuclear waste materials and value isotopes, so to speak. And I've written algorithms to modify the gammas spectrometers, which are special analsyer of radioactivity that analyze the energies. You know, the Geiger counter tells you how many clicks, so how much activity you have from a specific material, but it doesn't tell you what material it is. Instead, there are other technologies called spectrometers that analyze the energy of the particles. So we see the frequency of the photons. And then you can find a fingerprint of a caesium-137 or a strontium-90 or whatever.

So on one side, I use radioactivity and I study radioactivity and I sonify radioactivity. And on the other side is my DNA coded into music. I create neologisms for this, which is phonosomes and the phonosomic... The phonosomes are an algorithm to translate, in one way, my DNA into a piece of sounds, which is generative, of course. And then the twist is to mutate myself, my DNA, with radioactivity. But I use radioactivity not in a political or ecological way, but just as game changer of something that mutates, that creates the mutation. All around us, there is a lot of radioactivity and mutation happens in our body on a daily basis. And I just use radioactivity as an enhancer and as a human artifact, because it's totally... Many radioisotopes are totally human made and they are a symbol of this anthropogenic age we live in.

So my work is about change and I decided to take my big data, which is the DNA, which is one of the most sought-after data in the world because a lot of companies want your data, want your DNA. If you look at the prices of DNA analysis on Facebook, they are very low. They are very cheap because they want it. Okay? And I decided to take my data and to modify it and create mutations of this data.

□ Yeah, yeah. That's incredible.

○ So that's why I need to use algorithms, because I need to create a ward of translation. It's a work of translation.

□ Yeah. And I guess, that's also part of the zeitgeist in good and a bad sense at the same time, the fact that there is this tendency in the arts, of pushing the limits of these transductions, because I don't believe it's a translation. It's something else. Right? So there is, in a way... And here, you can see if you want, also, the corporate *zeitgeist*. We want to capture everything with algorithms. But then in your practices, I can sense – you're doing it for change.

○ Yeah.

□ And your work is political. I mean, what you said to me, it's extremely political.

○ Absolutely.

□ Taking ownership of your own data, mutating your own data, you know, transductions that are not there that you're inventing. This is all based on differences and producing differences.

○ It's an old tactical statement.

□ Completely, completely.

○ Absolutely. And that's why I totally appreciate what you said. We have to get back our data, get back the big data, but that means that we need to be educated on computers. I mean, if we avoid algorithms like strange entities that we don't know, we would never have power in it. We must learn the alphabet to write. So the most critical borders nowadays, for me, in my point of view, are the nations who are not able to get on the internet and to make computing. That's the most critical problem because the big differences in the future world will be those who have access and those who don't. But that is who can, those who can tackle because you can modify.

□ But that's also difficult. Right? Because then again, it's a little bit binary, what you said. In the future, will it not be a privilege, the very possibility of being disconnected? And isn't being disconnected eventually... empowering. Right? Because then my data are not traded. Only the rich are going to be able to be offline, right?

✱ You can choose. But the point is that whether you can choose or not. Maybe in the future, you will not be able to choose if you're online or not.

○ Exactly. You will not be able.

✱ And you will have to face the data.

□ Yeah. Only the rich people are going to be able to choose if to be online or not, because you're going to be immediately online. Right?

○ Probably, yes.

□ And so in that sense, being offline would be a privilege, but also a way of resisting, in a way. Right? And fucking the patterns of recognition of whatever system we're referring to.

○ I'm talking about being literate, about the language.

✱ I would actually say that, even before that, because we're in a world which is made of images, we have very little knowledge on how to read images. But the education, algorithms, computational devices, whatever, but we are still so far away because we were talking about identity and this world we are looking at, we look at it. We talk about things we see. We don't talk anymore about things we read. Maybe, no, not the majority. So there's not really a culture of how to see an image and how that relates to you. So imagine how many things...

□ And there's no much culture about "seeing" algorithms, right? Especially as algorithmic procedures are more and more invisible.

✱ It's both.

□ More and more invisible, if you want.

○ But at the same time, we are a society which is now driven by image.

✱ Yeah, that's exactly what I'm saying, because you're saying we need to get educated. I would take one step back and say we should actually be educated about images. And before saying how...

□ Why images? I mean, really, what's lacking is education about algorithms. I would say we are almost stepping out of... I mean, images are this glitterish mirage that is just there to track data to convey materials for algorithms... So it's a little bit of a *specchio for the allodole* [lark mirror]. It's not really the focus. I don't think it's images anymore. I think there is alphabetization towards images, now. A little bit more, at least, than in the past. There's no alphabetization on algorithms, and why? Because algorithms are becoming more and more invisible. Why? Because the distance between body and interface is shrinking. And your work is pointing towards that. Algorithms are getting into the body. And if the body is not algorithmic the way you are saying, it's becoming algorithmic because of this violence, right?

○ We willl become cybernetics in a matter of a few years. And you will not even realize it because it will start with nano medicines, with nanotechnology that will cure cancer.

□ Yeah, yeah, yeah.

○ But it's a process, I think, in my point of view, that we cannot avoid because we are on that path. And unless we destroy ourself with a nuclear war, we are going to be half digital, half biological, for sure, in a matter of few decades. Maybe 100 years.

□ Yeah, yeah, yeah. Nobody, I think, here is...

○ So that's why I'm very interested, for example, the most interesting music scene I see, it's not in Europe because in Europe we have too much monies, too much technology.

And for this absurd reason, the ones who have more money and technology by 40 years old, technology like modeler synthesizer to make music, they don't use computers. But in places like Argentina or Mexico, where the monies do not flow like in Europe, they use computers and Linux and they do biohacking. They do incredible hacking of themself using digital technology. And that's, for me, the very interesting thing that turned me on about modifying my DNA, exchanging my big data.

□ Yeah, yeah, yeah.

○ We have too many commodities. That's one of the biggest problems.

□ And also, that's also... Can I go back to the Middle East... I was also thinking, maybe it would be very nice to listen to something. Maybe this would be a nice way to close this conversation. If you guys have something online, maybe we can put it up. And then at some point... But I would like to say...

/ But we are offline.

□ We are offline?

/ We are disconnected. Yeah.

○ We are totally offline.

/ We are in the bunker.

□ Do you have anything on your computer?

○ Not disclosable right now.

□ Yeah, okay.

○ I'm going to make these expositions with the JRC in Brussels with this installation with my DNA and nuclear stuff in October.

□ This is new stuff. Yeah, okay.

○ Yeah. So it's s till quite secret, but I don't know if you guys have something else.

□ No, we can close on this, but I think it would be nice to close on a note that is somehow... it's a bit of a concern of mine because seeing all this incredible work and seeing all the references that you are talking about when it comes to biohacking in less developed countries, whatever it means, less developed. Right?

○ Less rich.

□ Yeah, let's say, less rich. If we think about what happened in the Middle East and the ways that technology has been used there, these moments of diversification in using technology as much as the moment of diversification that you guys, as artists, are able to produce with algorithms... How much this incredibly rich variety is immediately subsumed by algorithmic governance itself. Right? And then metabolized, and turned against, against the revolution in the Middle East, against experimentation that artists are doing to promote diversity. Then I think it's...

○ Yeah. In a globalized world with this technology, we face one huge problem which is background noise. Whenever the network is big, the noise gets higher. So it's very difficult. I mean, you can do... Probably we have a Michelangelo living, right now, somewhere in the world.

✱ I think there are many.

○ Probably, there are many. Leonardo. Okay? But we don't see them because everybody is shouting. Everybody is making noise. So we are not really under control. We have created something which is totally not under control. And I would like to ask you one, single question. Are you optimistic or negative about the future and algorithms?

□ That's a good point.

/ I have the...

□ That's a good question.

/ ... "skepticism of the reason and the optimism of the will." This is Antonio Gramsci.

○ That's pretty neat.

/ "*Ottimismo della volontà, scetticismo della ragione.*" Yeah.

□ Fantastic, fantastic. Yeah.

○ What could you say after Gramsci.

□ I have a good one, as well.

✱ I was about to say, yeah, thank you for passing me the word right now! I would say something really simple, that in my everyday work I produce ... and this is for money because, even if we were in the rich part of the world, I do not belong in the rich part of the city, probably. But I produce algorithms every day to make images. And I was teaching recently to some kids about 11, 12, 13, 14, something like that, and I saw that everything they talked about was images. How they communicated was through images.

Their mobile phones had image. The music they talked about, I was doing something regarding music, was through images. Everything was related to images and that's why I thought, we should really reinstate a sort of education of what time is in an image. What is in a film, in a movie, in a video. Everything is so... so as a reaction, I started painting again because I actually do a lot of stuff with algorithms, also, in video and real time, but then I thought, no, I don't want to do this anymore – and I had a huge project that I had to close because, as a reaction, and I said I was reactionary, let's say, in this way – And I said, "No, I will actually continue painting. I want something which is not..." (makes gesture with hand to show something tangible).

□ Yeah. And that's a tendency, a peculiar one, which is ... It's a return to the body. Right? It's a paradoxical return to the body, return to materiality. Right?

✱ Yes.

□ And in theory there's a lot of work done in that sense and Donatella... And then I have a quotation, then..

✱ Also, the fact is, if I do a painting, I'm not going to put it online. It's a different thing.

□ It has to be offline, completely.

✱ It's offline. Plus, it's only viewable by who has the painting. There's not anything much more local than this.

□ Back to the locality. And then the locality, to me, and I want to quote Keynes, to whom Bifo refers to, saying something like, "When the inevitable is in front of us and it seems you can't do anything," which is, in a way, the situation that we are currently living in, "the unpredictable, always happens"... I mean, this is going to restart everything from the beginning, in a way, it's sort of a loop. The unpredictable is really what the algorithms, itself, cannot catch right now, and wouldn't matter how many data you are in control of. The unpredictable would always happen and as such, in a way, is what produce what Guattari called beautifully the right to singularity, the right to be singular, which is the right to be local, eventually. I don't believe that algorithms at the moment are capable to do so for many reasons. So optimism, yeah. I think the Keynes and Gramsci did the job for us.

/ Yeah.

○ I admire you guys. I mean, I'm not optimistic at all.

□ You are totally nihilistic, almost.

○ Well, no. Neolistic. I mean, I've been living with people who have places and jobs in critical places of the government and they don't know what's going to be like. They don't know what's going to happen. And I fear that the power will always have the winning game.

So I'm not very optimistic because we were told that science would help man to have a better life and this is only partly true. We are using technology to make life worse, much, much worse than our world thought. I mean, 1984 is a joke today.

□ Of course, yeah.

○ It's a real joke. So I'm not very optimistic. I'm kind of negative. If we don't end up with a nuclear war in the next 25 years, which could happen...

/ In fact, Gramsci said, "Optimism of the will and pessimism of the reason."

○ That's why, that's why.

/ Which is a difference. But anyway, I think...

□ Really, the *uncomputable*, it's the scary part. Because in this sense... I mean, you see with the ecological disaster, with the Anthropocene and with global warming. We are not capable of predict enough...

○ We are not meant to ...

□ We are not able to compute these problems.

○ We are not meant to ...

□ There's intrinsically not enough computatational power, cause it's not about the amount of data... Right?

○ It's not in our DNA to de-evolve. I mean, to expansion and... *crescita*... I don't know how to...

□ De-growth.

/ Growth. Yeah.

○ It's just in our DNA. We are meant to do that. So it's very difficult that we will deal efficiently with global warming because we are not meant to do it. So that's a checkmate, of course.

✱ Yeah, but Bookchin [Murray Bookchin] doesn't really agree with you.

□ What do you mean we are not meant to do it?

✱ It's for de-growth.

□ Oh, de-growth. Okay.

✱ Yeah, of course.

/ This reopens a whole...

□ This opens everything.

○ This opens a black hole.

/ Yeah, growth and you just touched upon... growth versus de-growth, which is huge.

○ I don't believe in de-growth but he, of course, has his point of views and there are many good words about it, but I don't believe we are meant to step back.

□ I would like to believe in the un-computability of the biological and the fact that this uncomputability can possibly create the unpredictable moment that's going to save us from the inevitable moment. Right? The paradox here is that we can almost engineer that. And I want to say we need, at the moment... The only way out, we cannot leave that to biology. We need to use technology, because it's too late. Right?

○ Can I ask you something, guys, and then I...

□ Yeah. Of course, yeah.

○ What if I tell you, if you make your DNA analyzed tomorrow, everybody do it, we could cure incredible diseases like this, would you do it?

□ Yeah. But then, of course...

/ No.

□ That's the part... but I mean, yeah. But...

/ I wouldn't do it.

□ You wouldn't do it. Right?

/ No.

□ The thing is, you wouldn't have a chance to choose, in a way. Right?

○ Well, you have a chance today.

□ You would have a chance to choose about the policies behind these processes. Right? Okay, yeah, so let's do it because we will have these advantages. Well, it happened already in China. They removed this factor from the DNA and then...

○ Yeah. In the west, they are kind of...

□ Right? I mean, you know the story.

○ ... of putting the ethics before everything.

/ Yes.

○ A lot of diseases will be cured.

□ Yeah, but then is about data policies, right? Okay. Let's use the data in this way. They are encrypted. They can only be used in certain... You know, all this kind of things that...

○ It's like the atomic bomb but, once it's open, it's open. Once you open the Pandora's Box, it's open.

□ And you can't control it.

○ You cannot control it.

□ Right. And we are already in this phase right now. Right?

○ Yeah.

□ But can we steal it? That's the question.

○ I think that we can steal it.

□ As artists, as theoreticians...

○ I mean, I feel myself and I think he does, too, a little bit a hacker of music. And we hack computers to make stuff and we know how to correct systems, how to create crises in the systems.

So that's why being literate about algorithms is important. I mean, pretty much like being literate about Greek history.

✱ Yeah. I actually did a course on how to dismantle a bomb, for a job I did.

○ I'm doing a nuclear waste management.

✱ Fantastic. That could be useful sometime.

□ Then let me try to finish this because I was just trying to find... it's a kind of approach... pushing the limits towards which algorithms are failing.

Pushing the algorithms towards failing is a way to understand algorithms better and to possibly use them to create something different, and in a way, steering the opening of the Pandora door, which is anyway already open and what's inside is exploding right in front of us. I mean, maybe. I mean, because it seems that you guys are pushing these thresholds. Right? When the algorithm fails...

○ Well, I don't think that there's a perfect algorithm anywhere. I mean, "Only God is perfect," you will be told by a religious man. I think that computers fail every day, many times. And we fail, too, the same way. And one of the most dangerous things is to create something perfect. Perfect societies, worst scenarios we had in history. So we don't have to look for perfect, but we have to be able to control it some way on a personal level.

□ Yeah, on a local level, if you want.

○ On a local level, yeah.

□ And towards diversification, towards bifurcation, towards...

○ Diversification is part of our nature.

□ Yes. And not of algorithms. And now we're back to the technological use...

○ Actually, it depends by the algorithm because the one me and he write creates diversification.

□ Exactly, yeah.

○ They are designed to create diversification.

✱ We actually desire that this happens.

○ Exactly.

✱ It's within our will and our desire to make this happen.

□ Yeah, yeah. So it's possible. You guys are doing it. The only problem is that the system is really trying to metabolize these fantastic experiments. And it's succeeding, and yet there's always something...

○ But there are a lot of data which are available.

□ Exactly.

○ Which is very interesting. The DNA that you don't want to give right now, it is available for scientists.

✱ In his laptop. Already now.

○ Anybody can look for genetic browsers, which can show you many, many interesting things. And that's what I'm doing with my genetic code. I have my pieces and I can check with the genetic browsers what they are. Those pieces might have some disease, okay, or not. But I have some control now on that data. It's not in some corporation. They have it, JRC, of course. But they can do whatever they want, I told them.

□ So okay, reclaiming control of data, promoting bifurcations, and pushing algorithms towards failure to invent new algorithms that will eventually implement diversity. Don't reply so we have a closing now...

○ At least being active and not just subjects.

□ Right. Right, right, right. Thank you, guys. It was fantastic meeting you.

✱ Thank you, yeah.

○ Thanks to you.

□ And, yes. I'm not sure how we're going to be able to get out of here.

/ We should get out of the bunker. Please, get us out.

□ I think we are locked in. I mean, but ... yeah.

/ Get us out of the bunker.

□ Yeah, it was nice.

○ Super.

□ Fantastic. Yeah, thank you then. All right. What are you...