

Beyond and Within: AI Talks

Episode 4 | Have we been Trained?

As an essential part of *Ether's Bloom: A Programme on Artificial Intelligence*, the new podcast *Beyond and Within: AI Talks* invites experts, artists and researchers to dive deeper into the world of Artificial Intelligence (AI) and some of the vital questions it raises. It takes the listeners on a journey of questions, analyses and knowledge, while exploring the many sides of the fast-growing technologies around AI.

In the fourth episode *Have we been Trained?*, podcast host Eliane Eid tackles the relation between authorship, creativity, and machine learning. Driven from the practice itself, she questions along with her guests Jenna Sutela and Jonathan Apelbaum the role and importance of AI in different artistic practices, its changes and advantages as well as its limitations. Is the practice forever changing, or are we used to the ongoing shift in the arts? Are we leaning towards more cognitive art creation?

(As this transcript is based on a conversation, it contains colloquial phrases. It has been edited for better readability.)

Part I

Eliane Eid: Hello everyone and welcome to our podcast *Beyond and Within: AI Talks*. I am Eliane Eid and I will be moderating the episodes of this podcast that was developed by the team here at the Gropius Bau. What is *Beyond and Within*? This limited series of five episodes will take you to a journey of reflection, curiosity and conversations regarding AI with a focus on a more artistic perspective. Within this format, we are discussing points of accessibility, fears and possibilities that come within this technology. We wanted to create this podcast as we had a lot of questions, concerns and ideas about how AI is changing our daily and artistic life. So, we decided to jump on this ride and open up the conversation with experts, artists and researchers who have been studying and working with AI for quite some time and asked their opinion and knowledge about all those questions that are emerging. This podcast is part of *Ether's Bloom: A Programme on Artificial Intelligence*, where we are hosting different artistic presentations and diving into the topic of AI on different levels, through a Writer in Residence, workshops, and discussions. The thoughts of this programme will inform the development of an app which we will launch in 2024.

In this episode, we would like to highlight different artistic forms and potential with artificial intelligence and therefore we will be talking with two different artists who are currently working with AI and Art. I would like to first welcome Jenna Sutela, who is an artist and who works with words, sound and other living media as she engages with both futuristic and ancient materials and audiovisual pieces, sculptures and performances. Thank you for joining us today.

Jenna Sutela: Thanks for having me.

Eid: Jenna, I'm gonna jump right in and I would like to ask you: what sparked your interest and how did you decide to start working with artificial intelligence?

Sutela: I was always interested in systems and sort of art, cybernetics, cognitive science and I was working with computation and digital technologies. For example, I made this work, *Gut-Machine Poetry* in 2017. That was about introducing sort of chaotic processes into computing, via inserting fermenting foodstuff into the guts of a computer. So I was experimenting with what it could mean if the computer had a gut brain like us. The work was basically this sort of digital microbial poetry culture, some sort of a wetware random number generator that was based on microscopic footage of a kombucha SCOBY (symbiotic culture of bacteria and yeast) connected to a bunch of letters or syllables floating on the screen. The stochastic movement of yeast eating sugar in the ferment affected the jumbling of the syllables that eventually came together as some kinds of words in the digital space. I just brought this up because then I think the next project I did was *nimiia cétii*, that took this kind of thinking about embodied cognition in the realm of machines a bit further, at least kind of technically speaking. I mean, *nimiia cétii* was made with machine

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learning and this was 2018. Even if that was only five years ago, the difference today, when it comes to where AI is and how accessible or really pervasive it is, is huge. Anyway, how I got access to it at the time was through this artist residency in London, where I was offered two tours in the field and also a sufficient computing muscle to work with stuff like audio generation models. So that was the beginning, I guess.

Eid: That sounds very interesting, especially when you mentioned the gut brain. I think we're going to circle back to this in a few minutes, but from your experience, I would like to know how you would look at AI in that sense? Is it a tool, a resource, or a take over how everyone is now framing artificial intelligence?

Sutela: Well, one way to look at it is that when machines can take over some tasks that were traditionally done by us humans like organising information, for example, some time is released for us to develop ourselves and find out what our potential as humans could actually be. I'm thinking specifically about this recent text by Yuk Hui, where he is thinking of different possible relationships between humans and machines that surpass competition or don't reduce us to mere patterns of consumption. Then there's another useful approach that I think came from this text by Nora Khan, who suggested that it might be useful to think about AI as a sort of a primordial force of nature, like a star system or a hurricane, something strong but indifferent nevertheless. I'm sure there's going to be a lot of existential shifts or there are already going on, but it's a complicated matter for sure.

Eid: As for your work, how do you usually start your process? Especially with different algorithms. I know there are so many different AI modules that we can work with. So I'm interested to know a bit more about your artistic routine and how this may be changed, or how it's similar to your process.

Sutela: Yeah, I don't know if it changed so much as I was working with algorithms anyway and also working with other stuff like sculptural materials or living matter, like the ferments that I mentioned before, but of course...A lot of art, this AI art now in that it uses deep learning and large language models for research and sketching, or even the kind of image, object, sound or software making itself. On a daily level, I guess I'm talking to GPT quite a lot instead of, say, googling.

Eid: I want to go back to what you mentioned a few minutes ago. So you also work with artificial neural networks. Can you explain a bit how you would be able to extract neural networks into the art field? Because for me, I find this very different or maybe very far away and it's very interesting how you brought them together.

Sutela: Well, I guess what's characteristic of my work with artificial neural networks is that I'm always trying to put it in touch with the modern human world around it, teaching it with materials like bacterial movements or star pulses. In the same way, I'm always exploring the human system and intelligence in connection to the wider environment, with a focus on different interspecies relations within and without us. This just brings to mind, maybe somehow connected, in addition to my interest in the gut brain connection and the experiments that I did with machines and ferments, I had this performance in 2016, where I ingested visceral effluent, the single celled, yet many headed species of slime mold that's also known as a natural computer of sorts. As part of this reading, I imagined that its hive-like behavior was programming my own. So I always considered this sort of speech act or this particular speech act as a form of artificial intelligence, since the slime really helped me make connections where none previously existed. So it's really about interconnectivity, I guess.

Eid: Yeah, definitely. This reminds me of *I Magma*. I found it fascinating the connection between liquid sculpture and the neural intelligence networks. So can we talk a little bit more about it?

Sutela: What's happening in that work is that a machine, Oracle, creates predictions based on the flow of goo inside a group of head shaped lava lamps that are also my neuro plastic portraits. The idea of machine generated divination came from the origins of binary code in the etching.

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[Gottfried Wilhelm] Leibniz, who discovered the language of computing, was inspired by this ancient Chinese divination system and then the kind of AI generated in *I Magma* divination as they build on trip reports from Arrowhead and texts from the Internet Sacred Text Archive and the system. In that work, it uses shapes in the lava lamp as cues for the predictions that can be accessed in the *I Magma* mobile app.

Eid: What were some of the challenges you faced? Especially when we're talking about predictions, because we never know what to expect sometimes from those machines.

Sutela: It was an interesting process. Again, this was like 2019. So it was time before GPT-3, the text generation was a bit more rudimentary, but actually the problem at the time was beyond this. I used this Internet Sacred Text archive as one of the materials along with the trip reports. It's like a collection of old sort of folkloric, mystical texts. I already had to omit certain words that didn't kind of fit, reality as we know it and then the problem, technically speaking or language wise, was that the fact that I was trying to push for slightly too realistic definitions that lacked the "mistakes". It was trying to describe the process of how the lava lamp is taking shape and how it's coming up with its own definition instead of the tone that I was after. I had to do a bit of curation or also a bit of dumbing down the system in a way. I really wanted them to come out more mystical in a way that some of my favorites would sound like: No central creatures are fixed, where AI is a derivative, or a single reality... But this was the tone that I was going for and to get there demanded quite a lot of selection at least.

Eid: I'm now imagining feeding an AI some folklore text or mythical text. I can't imagine what it would do with them, you know. So I'm sure you've seen this part of the algorithm.

Sutela: I also felt like it was an interesting experience because I read so many of these definitions created by the system and thought that there was a part of that syntax. That kind of inherent syntax was somehow showing up throughout the process while just going through them and selecting the best ones.

Eid: I have a curious question that drives away a bit from the talk, but did anyone from the audience or the public ever ask you (because the sculpture of this piece is, like you said, a reflection of your portrait) for a personal piece of their faces, or not?

Sutela: No, no, I don't think so. That would be interesting for sure.

Eid: Okay. I just wanted to ask because I think it would be very interesting to see that if people had this thought. So as you mentioned, you also worked with interspecies intelligences. Based on your experience, I would like to know what we can learn from bacteria as artists and also as viewers?

Sutela: I think bacteria really make us who we are. There's so much bacteria in our bodies, more than so-called human cells. To sort of answer your question, I feel like maybe we can learn this form of existence. We're actually many and I've been looking into a bunch of works that I've also mentioned before. [For] *nimiia cétiï*, for example, I took as a protagonist this bacterium: *Bacillus subtilis*. It's one of the main gut bacteria, but then it's also a species that's taken on space flights to test the limit of life on Mars, for example. So there's this thinking where bacteria, this kind of extremophile lake bacteria, might be able to survive a spaceflight. In a way, then these bacteria that are also shaping our thoughts and emotions through the gut brain connection might actually come from outer space. I think there's also something where this kind of thinking of universal life, or what we consider as alien... – that's actually in us. There's a lot of potential learning there.

Eid: As you know, now, especially those few months, a lot of new updates have emerged with AI. Especially with ChatGPT and with other machines or modules. So how do you see yourself going forward with all of those tools and all of those resources?

Sutela: Regarding AI in particular, I feel like as a tool, it's quite complex as there are all these external forces at play. It's often companies that create and host the algorithms and the platforms

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that we then end up working with. So I'd certainly welcome more artist-initiated tech and AI tools. Mat Dryhurst's and Holly Herndon's spawning is a good example of something like this. Their focus is particularly on consenting data, trying to answer this question from the perspective of the tools and what could be done with them or to this landscape. At large, I'm quite bothered by the inherently kind of centralising nature of AI and curious about ways to decentralise it. What these can introduce is this non-instrumentalised thinking and working in the realm of technology at large. Like making weird, perhaps useless things and focusing on things within themselves. So these are the kinds of things that I'm thinking about in relation to working with these tools.

Eid: Definitely. We're now heading towards the end of the talk, but I have one final question. So when I look at the arts, we all know that the arts are always changing and they're always new things that come up or are different. There's always, like we said, so many different tools or ways we can create. But why is it that when there is a new technology, we're always afraid of its potential? Even though personally I sometimes feel like AI is like the brush or like the camera, you know, when you introduce something new to an artist. So why is it that maybe we're always that shocked with something new that emerges?

Sutela: Maybe I would also go back to my previous answer a little bit there, because I guess this kind of tool or brush in particular comes with so many forces at play, kind of external forces at play. Of course, this is not new in a sense that there's been other commercial tools in use before. And of course, there are possibilities to work with artificial neural networks in kind of an open source way or in different ways. Of course, there's still the access question...like the computing power and things like that. So just to say that it's kind of a complex bag of things, even just the amount of energy that it requires, that sort of already lays out a much heavier, infrastructural and material engagement than like a brush or so. Those are some of the complications, with AI in particular.

Eid: I actually have one last question. Because I wrote a note and I wanted to get back to it. You mentioned before the chaotic processes of using such a tool. So my final question would be: how did you usually control those processes? If at some point you felt like what you're creating went out of your vision, or maybe it was too much or you needed to control it in a way or another. So how do you usually handle these situations?

Sutela: Well, there's always this element of chance in my work. So I feel as if I'm almost setting up these situations or settings or building some sort of architecture for processes to take place. I guess that sort of architecture or the setting, that's kind of my part or my sort of structure that I play. But of course, also, like many of the works, the process become the videos, for example. Then there's the editing process, just to mention some more recent works. There's, for example, this earth battery powered compost or a culvert miscible that's currently on display at the Swiss Institute in New York, where these kind of worms, soil, metals and food scraps are producing energy for a sound work that actually also uses AI voice cloning software. I'm using some tone transfer technology in the sound piece itself, but actually the sort of chance element is this power that's coming from the soil. That's of course very much connected to the wider environment in a sense that what happens there and how's the temperature outside. That makes it sort of prone to cuts or it's this kind of very low tech setting in this way. So in that case, for example, the work is there but the power falls under the chance of element, like how much you can hear. The things going on in the compost kind of affect the sound work itself adding echo and saturation etc... There's different sorts I like these different sorts of ways to deal with the chaos, but I also really celebrate the chaos. So that's a big part of the work.

Eid: That's beautifully well said, to let the chaos just be present. I really need to thank you. It was really nice to take a brief look and also a bit of a deeper look into your work. Thank you for joining us today.

Sutela: Thank you for having me.

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Part II

Eid: I would like to welcome Jonathan Applebaum, who's an engineer and painter. A combination that I actually really love. We will be discussing cognitive paintings, Jonathan's artistic practice and art creation with AI tools. Thank you, Jonathan, for joining us. I'm happy that you're here.

Jonathan Apelbaum: Thanks a lot. I'm super happy too, I'm looking forward to it. It's the first time I do a podcast.

Eid: To be honest, I'm still amazed with the show that I attended in your studio because seeing all the paintings come to life in this setting was fascinating to me because it was a combination of everything, oil paintings, music and a performance at the same time. I didn't have words after it.

Apelbaum: The goal is for technology to bring people together. So we use an analogue format (which is painting now) and then we use tools – AI is one of the tools we use. We use a lot of other tools that are linked to AI, or linked to technology, cognitive technology. And then it builds a platform between different disciplines. I think in German you say "Gesamtkunstwerk". I don't know how we say it in English, I don't think there is a word for that, but it's a global piece of art. It's like putting engineering software together with performance, sound design, sociology – it's all these aspects together, all in one event.

Eid: I know that you have a background in engineering, but I would love to know what sparked your interest? How did you decide that? Where was the point you decided: "Okay, I'm going to create this right now and do this first."

Apelbaum: I started to study engineering because I don't come from a rich family. In France, we say: "if you're not rich, you need to be an engineer or a doctor to elevate yourself socially." Coming from the suburbs of Paris, I knew that it was the only possibility. It was more of a survival question, the engineering thing. Then I noticed that I was queer. It was really difficult in the engineering world to be accepted, but I really liked that. As an engineer, you can solve problems. I learned to find problems and to solve them as an engineer. It's really the main job of a senior engineer: to learn really quickly, to have a new environment and adapt to it and adapt to this limitation. Artistically, it was always a dream and I thought I wanted to be an architect, but when I realized it's really boring as I was studying engineering and architecture. I had a blood infection and I was always dreaming about being an artist. After the blood infection I nearly died and I said: "No, I'm not going to spend all my life working as an engineer and then I will miss all my life." So at 25, I left the hospital and I left my job as an engineer and I started to work full-time as an artist. But it was not what it is now. I was just doing classical painting. One day, one of the paintings I had was lighting up, the sun was shining. It's not the studio that you saw in [Berlin] Mitte, which is really dark. It was on the fourth floor and the light was shining against the painting and the painting was similar to when you go into church and you have those big windows. I thought: "Oh, this is really interesting." To lid up the painting from behind. It's strange how it all connected. I wanted to put a lot of different people together in one room at the opening. So I was painting engineers, dancers, choreographers, theater people and curators. I was spending time with all these people, making portraits of them, but they would not work together. They would only meet at the opening. Putting my engineering background in the painting helped me not only with the process, but with bringing all these people together to collaborate in a way or another. Working together from the beginning to the end is a really long process. My team now that I have been working with for five years is always moving and growing. We started with one curator, one engineer, one software engineer and one choreographer. They are still with me now and the team grew a lot.

The essence of our work was engineering art, and this combination came after many years of collaborations. But if I wouldn't be queer and if I wouldn't have so many issues either...I think I

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always wanted to be an artist. For me it was more of an easier survival question. I wouldn't have survived without it, I'm too much of a weirdo to be an engineer. I think when you work as an artist, the social impact you have is so big compared to [when] you're an engineer. Politics, as an engineer... you can't just be yourself. I was working in the train industry, but politics is so strong. So even if I build the best thing, which is the best for the environment, the state might not buy it. If you decide to focus on electric cars, which is a mistake, I cannot do anything. But as an artist, you can have a community and this community can really change the world and it can just change around the community. If you can change a life of two or 300 or 500 or 1000 people, it's already such a big step then not changing anything because politics is so big and you are such a small part on the scale of decision making that you cannot do anything. But now, as an artist and with a big studio and even if we are really underground, I think it's all coming together. It's really a community that we are building. Community is changing the world. The more we are intimate, the more we are open to each other, the more we can change the world.

Eid: I also felt the sense of community within the pieces themselves. You told me a bit about the process and I would love for you to talk about that as well. I felt within your work, there is kind of a translation process from the people you work with, with the stories that they give you and then you're translating that into photographs and then into paintings and then into the AI tools and elements. So if you can just talk a bit about that, because I found it very inspiring. How the story shifted from one place to the other.

Apelbaum: So I work mostly with queer people, but when I work with people, I will need to know exactly who they are. Maybe it's engineering stuff, or in AI we say we are "gathering information." You need a lot of information to be able to build a portrait of someone. So what I do is I meet the people and then I will interview them. I will write the entire life on their body. Then I will take an analogue picture with a middle format camera, a Mamiya and I will take a small video recording the interview. All that will create the painting, the cognitive painting. So it's a mix, an installation. With the recording of the people we are going to summarise this process that is from two hours to eight hours, to around a 15-minutelong installation. Then, we put it in our software that's called Frame Designer, because we always wanted to have human inputs and machine inputs. For example, the software is able to scan people. We use a Google kernel, which is a building neural network and it's able to recognise people in the room, where they are. So it's an interactive piece. It's really complicated because it's all connected. On [the] one side you have this camera system, so this coding system is an AI system. It's using a lot of AI algorithms because it goes way quicker. If we want to recognise a person, we will use this AI algorithm because they are extremely quick. It's neural networks and you can recognise up to 10 or 20 people in a room. Then, we create a soundtrack and [an] interactive soundtrack that is connected to the movement of the people in the room, but that is also connected to the music, which is a 15-minute track that we built ourselves. So you have an AI influence, you have a human influence at the same time and you have a creative input that is..., in German we say "first dramaturgy". It's a red line that we can follow. Basically, we have this 15-minute installation, but they're always changing. It's always new depending on who will be in front of the painting. At the same time, it still has a main story that we want to showcase because it's a portrait of a person.

Eid: It's almost like a collective experience and collective creation because, like you said, everyone's contributing in a way or another.

Apelbaum: Completely, yes. This is what it is. I think the problem with art is that it's putting a lot of people aside. I come from the suburbs. I want to do art that includes everyone and has lots of layers, but that it's accessible for everyone. I think when you go to a museum...we don't realise it, but not a lot of people like to read, for example, or not a lot of people like just a painting. So how do you connect with the painting? If the painting connects to you, it's much easier to grab what is behind. It's exactly like if you are becoming a creator and I think everyone is a creator. That's what I want to emphasize in the painting – that you're also taking part in the creation of the painting. You are becoming part of the painting and every person that will be in front of the painting will automatically become part of the painting.

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One of the biggest problems is also (this in AI): the classical AI is using a lot of solutions that are really slow and data abusive. Art creation with AI requires a lot of data. It also means that when you work with a classical AI software, that is not running, almost 95% of the software is useless, but it's still running. I would say it's like ChatGPT. It may write something good, but it's really generic and it's really impersonal. At the beginning we were taking some blocks and then putting them in our software and now we are nearly writing everything ourselves. It's much more interesting, it's much more challenging. We just take a small bit of software that we use specifically, but we completely rewrote our own infrastructure and we hardcoded everything.

Even the base of our software is our own now. It's not something we take on the internet or everything we do right now is our own and we are actually trying to use as little as we can from the internet or from software that has been done already. So it's really complicated, but also it's much more efficient. What we have now with AI is a great tool in a way if you use it really carefully and in an interesting way. If you use it just [for] like everything – to generate text, taxes and everything (that is also what a lot of people are doing), it's really data abusive. People use so much data for nothing and it's also really boring I would say. AI is basically using the mainstream and they summarise the mainstream, so you don't have any point of view anymore. For example, the software will use it at the beginning to recognise people. If you are Black or Arab, it cannot recognise you. You could just recognise white people because it's the majority in the tech **bullshit** macho industry and even women have difficulty to be recognised, you know. Even if you had long hair, the camera, the system that we use at the beginning before writing our own software, would not have recognised a lot of different people. Now we changed the software so much that sometimes cis men are not recognised anymore, which is really fun. We really had a problem once. Some guy...he was one of the only straight men that came to this show...and the camera would not see them. It was really funny. We don't know what happened, because we turned the software around so it can recognise more diverse people and sometimes the really cliché people are not recognised anymore through our software.

Eid: It's interesting because I think one of the biggest discussions now within AI is how biased it can be. So reaching this moment where you're like: "Okay, no, I change your entire base", is funny but at the same time important.

Apelbaum: But the problem also is that it's so much work that we have to put [into it] to be able to create a software that is more fair, because we don't have any database. So it's much more complex to do that. It's much more challenging. For me, the other problem is: if AI is just to do the things we've already done, then what's the point?

I think AI is really tricky, because it just uses existing data. So it doesn't really create new data. We have to give the impulse. In a way, AI is just repeating what has been already done. Also it's really limiting. If you use all this software, you cannot speak about sexuality, you cannot speak about gender, you cannot speak about politics. I always think we have to be really careful with AI. Looking at the country that uses the most AI in the world, which is China (it's not even the USA) – and it's a dictatorship. So for me AI is really complicated because it's really easy to generalise everything with AI and it gets super boring. It's a problem of freedom of speech. So this is why we never use everything available. We are working on the software to make it our own.

Eid: I really like this approach because I know some artists would say I don't want to deal with AI in the first place because it's biased, because it generalises things and because it's scary on so many levels. But for you to just take the narrative and take the algorithm and be like: "No, I want to change that." It's also a very powerful move, to claim the technology in a way.

Apelbaum: I always use the example of rich people. Rich people are really good at proclaiming everything their own. That's why for me, it's really important that we are not rich. We are poor, we are a community. We don't have so much money, but we can claim that each of the things we are using is our own thing. It's also like dealing with a dynamic of power. If we are creating our own tools, it's our tools and we are the only ones who know how to use them. It's also really political to me because then, we don't use the mainstream tool. We take from the mainstream tool and then we invert it and create our own subversive tool. It's completely changing the value of a tool. But the work to understand how this tool is working is massive. I remember the new system we were

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working on to recognise people in the room, and we've been working for three months and it was still not finished. Do you know the frame designer? All the software? We started five years ago and it's still a work in progress. You need a lot of constant work to be able to create your own tool. It's so much work, but I think every great work is a lot of work.

I don't think there is any work that fully changed society. You have a lot of work behind it. I don't believe it's an easy task. If it would be easy to create an equal society, the society would not be as chaotic as it is now. We always need a lot of work and a lot of courage. We should never give up if we want to be able to change society.

All these AI tools are the same. Of course I want to use them, but I want to make them my own because it's like religion, spirituality – it is really interesting if you use it properly and if it's used as a good end, otherwise it's a disaster. AI is the same. I mean, it can be so disastrous. But if you use it properly, it's amazing and it can change a lot of things. But it's so complicated to use it properly as the softwares is so complex, they are not made accessible for the people.

Actually, I think in real life, when you really look at it, they are quite simple. But you need to know how to take away all the layers around it. I think the AI system is not the best system in the world. It is one of the less efficient systems in the world. I still think that human beings are much stronger than any AI system at the end. Between the first software we used that we sourced from the internet and the software we have now that we wrote all ourselves, we can see the difference. The software is up to 20 times more efficient, and it's also ten times shorter, but it was so much work because we had to rewrite everything ourselves, in order to use one specific function that we needed. We as a society are producing so much. We should produce only what is essential. We don't need a car that is electric and can massage your feet at the same time that it can massage your head, this is not a necessity. What we need is a transport that is really cheap and respects the environment. It's also really challenging to build this transport. The world is focusing on the wrong things. We are focusing on creating more money instead of using the money that we have and sharing it better between all the people in order to create a simple way of exchanging and communicating.

Eid: How we use AI is very important, like you said, and also very dangerous. But one last thing I want to point out about the performance that I saw, and also maybe what you're working on right now, which is the choreographies that take place with AI, because what intrigued me or what sparked also my attention, is this connection between the painting and the choreography and the people in the room. What I'd be interested to know is: is the dancer or the artist reacting to the painting, or is the painting reacting to the artist, or is it both at the same time?

Apelbaum: When I work with someone, I always say there are three rules that you need to respect. One is you need to interact with the painting, you need to interact with the public and three, it needs to be something personal and intimate that you are sharing. I call it a self-interaction, it's a technological interaction and it's a public interaction. Then it's always a discussion between the painting, the choreographer, me and also the public. But the public...it's much more difficult because we cannot rehearse with the public. We cannot rehearse every time with a hundred people in the room. But it's a discussion between all of these parameters. I don't like when stuff is already decided in advance. This is why it's always a discussion, it's always going together. Everything is influencing everything. In the end, we always have technological limitations. I always tell the people: "Okay, so this is where we are now, this is what we can do for sure and the rest I don't know."

In the future I would like to let the painting move in the room. Also scanning the room using AI and then moving physically and changing the spaces in the room. Because now we are completely changing the atmosphere. For now it's the light that we are changing. The oil painting has 60 layers of oil, and there are different light colors installed, so depending on which light you use you will see different things in the painting.

It's completely changing the meaning of the performances. Now imagine that we can even move the room, how much it will change the performances and the influence of the performances. What

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I like sometimes is when we work with people, I say: "Let's do the opposite, completely the opposite dramatically of what the performance wants to do and let's see how these two antagonist things react together."

I'm always thinking about having a lot of artists who are using self-generated data. So let's say the painting is making decisions on their own, but we are always behind the painting at the end. We just use AI as a tool to scan the room or to modify the pitch. But even when we modify the pitch, we give a range of parameters [so] that we can modify the range and we don't use [it]. I think lots of people that don't know about AI just see a self-generated thing – we don't do that at all. This is what I learned as an engineer: you can never let the control go because there are so many millions of parameters. If you understand engineering and technology, you just wouldn't do it.

Eid: Is this also a way to protect the public in a way, as well as the privacy of certain artists?

Apelbaum: Yes. For example, all the software we are using doesn't communicate data with the internet. So we always use the house-owned database. There is nothing that goes online because most of the AI stuff you do now, you send it to a server. The server analyses it and sends it back to you. We don't do that. We have our own AI chip data we call a local server. They are on our own local server and they don't run out. Nothing is getting out of our own art installation. It's also completely encrypted, so no one can...I mean, probably the NSA or something could...but otherwise, I think it's really complex to get into our system.

Our system is not written by a machine, it's written by a human being using sometimes AI and sometimes software block. By the way it was built, no one really understands how it's functioning other than the people that made it. This is also one of the most important things to me, that the data is our own data and it's not shared with anyone. The privacy is super high, it's not going online at all.

And also the show that we do, we of course have videos and everything, but we keep it for us only. The idea of privacy is super important, to the point that what happens in the room during the opening stays in the room, it is not shared online. The audience there is the only one seeing it. It's like their own treasure and memory, it is not the property of anyone else.

Eid: Thank you Jonathan, because you really highlighted the possibilities of AI while keeping the privacy of the people you're working with and the public. Thank you for joining and I hope you enjoyed the process as well.

Apelbaum: Thank you.

Eid: I also need to thank everyone who helped develop and produce this podcast. Madeleine Köberlein, our co-producer. Luis Kürschner, our sound designer and editor, Çağla Erdemir for all the assistance, and of course Clara Meister, our supervisor and Programme Lead of the AI project here at the Gropius Bau, along with the institution for providing us with this space to take the audience into this journey.

The Gropius Bau and the programme are funded by the Ministry for Culture and Media. And for our next and final episode, we will be talking to an AI. So stay tuned.