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Uncertain Technologies

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Marc Villanueva Mir Bachelor's Degree in Stage Directing and Dramaturgy from the Institut del Teatre, and in Literary Studies from the Universitat de Barcelona. He did the Master of Arts in Applied Theatre Studies at the Justus-Liebig-Universität Gießen. His projects particularly focus on the dramaturgy of the image, the performativity of technology, and the active participation of spectators. He is an associate professor in the Bachelor's Degree in Literary Studies at the Universitat de Barcelona, as well as coordinator and teacher of the Postgraduate Degree in Performance and Digital Technology at the Institut del Teatre.

English translation, Neil CHARLTON.

Abstract

Transcript of the text of the opening lecture of the symposium "Live Art and Uncertain Technologies" of the journal *Estudis Escènics* held at the Institut del Teatre in 2024. The aim is to develop and question the idea of innovation in the use of technologies on stage and to assess uncertainty as the foundation of artistic creation. Uncertainty characterises the relationship we have with technology, or that we want to have. From the point of view of artistic creation, digital technologies pose questions about agency, presence, interaction, communication or perception: fundamental questions for live art that digital media do not exhaust, but rather amplify and recontextualise. As with divination, with technology we seek more questions than answers, more uncertainty than accuracy, more mystery than assertion.

Keywords: technology, new technologies, uncertainty, innovation, progress, materiality, agency, cognition

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Uncertain Technologies

The lecture is accompanied by projected images and sound, which we believe complement it performatively. We cite the moments in which they appear.

UNCERTAINTY

When we talk about new technologies, it is as if we are talking about technologies that have just been invented. And as if the world that accompanies them has just been invented, too, and all the unsolved problems suddenly become part of the past. Talking about new technologies today, in which large companies monopolise the discourse of innovation with constant and spectacular launches of products that do more or less the same thing as before, also leads us to accept a discourse that tells us that obsolescence is normal, and that if we cannot keep up with the pace of progress we will be left behind in the march of history.

Beyond the obvious problems that this entails, because we neither have enough natural resources to sustain this pace, nor enough time to enjoy it, or to learn anything before it becomes outdated, talking about new technologies from the stage takes us to a paradox: innovation for innovation's sake usually does not make for good shows, and there are technologies that we still call "new" today even though they have been used for many years. Is video a new technology? Are live projections, mapping or streaming new technologies? How many years have interactive shows been made, with or without microprocessors or sensors?

And yet, something keeps us talking about "new technologies", somewhat like when we keep talking about "emerging creators". What we want to suggest to open this symposium is that, in reality, it is not innovation that fascinates or inspires us in a technology, but uncertainty; that is, when we are not very clear about what a technology is used for or could be used for. There are technologies that we don't regard as particularly mysterious: an

air conditioner, for example. Others, such as the stereoscope, captured the imagination of one generation but not the next. At the end of the 19th century, electricity was conceived as a mysterious fairy. Artificial intelligence is an idea that dates back at least to the 1950s, but if in recent years it has managed to excite our imagination again, it is because no one knew what it was capable of doing, or what we would be able to do with it. Uncertainty.

Uncertainty is at the root of artistic creation, and technology is just another body that can play with us. Perhaps today it would be a little difficult for us to be seduced by how a calculator works, but, on the other hand, we can get butterflies in the stomach when we wait for the roll of a die. A die gives rise to play, taking risks, debating whether it has landed well or not, whether it is fixed or not, whether we accept its authority or repeat the roll, or whether in the end it does not matter to us what the die has said, because the mere fact of asking it a question has made us see that we already knew the answer. Uncertain technology, like an oracle, never gives us the answer we want.

What questions do we ask of technology? What answer do we expect? How do we imagine the theatre of the future?

How does live art adapt to a transforming world?

Where are we right now? Are we here, or are we scattered in a swarm of cables and data?

Are robots alive?
What other bodies perform with us?
How far can a human body go?
Is voice a technology?
Do machines imagine?
Do computers see?

What do we look for in technologies?
When did we humans start using technology?
How many beings on Earth use it, apart from us?
Of which part of us is it an extension?
Is a technology invented?

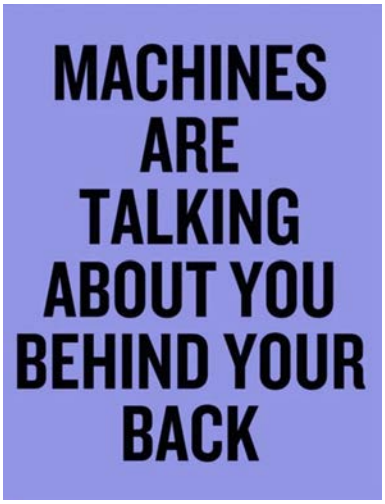
How can we use this technology to create more sustainable, more poetic, and more vital relationships?

What does performing mean in a world full of phantoms?

Here an image is projected from a scene from *Dr. Mabuse* [Fritz Lang, 1922]and a poster from the piece *Slogans for the 21st Century*, by Douglas Couplan [2011-2014].

MYSTERY

We watch together on the screen a fragment of Werner Herzog's film *Caves of forgotten dreams* [2010], without sound.



Magic lanterns, movie machines... The illusion of the moving image could have been with us since the Palaeolithic era. Caves hide mysteries and secrets. Images of animals that seem to float between the walls, attempts at optical illusions, three-dimensional effects, eight legged-animals that, combined with the light of fire, must have clearly looked like hallucinatory films.

Miguel Herrero Herrero (2020) suggests that Palaeolithic caves could have worked as darkrooms; that a single ray of light could have entered through a natural opening, which would have projected the images from the outside onto the cave walls. Perhaps this would explain the inverted horse at Lascaux or the superimposition of animals on top of each other. The first cinema would have consisted of the projection of these images of animals in motion. Images that could also have been perceived as spirits that appeared between the walls of the cave.

"When I look at the night sky, I see the past", says musician Víctor Nubla (2018: 7). Víctor's house was like one of those mysterious caves where moving images enter through holes. Images that floated amidst music and opium smoke in an invocation of the mysteries of the past and future. An activist of experimentation, Víctor is our first invocation today. He manifests through the written word. We, mediums, read it.

While Nubla speaks, the following videos appear on screen:

Animals in Mirrors, Hilarious Reactions (https://www.youtube.com/watch?v=GaMylwohL14) (without sound)

1877 recording of Thomas A. Edison reading the poem *Mary HAD A LITTLE LAMB* (https://www.youtube.com/watch?v=YBXyuY2J20o)

Clawing out a cylinder in real-time (https://www.youtube.com/shorts/Kl6IpKAsYtU) (without sound)

The video of the 2020 rotating sun recorded by SDO, NASA's Solar Dynamics Observatory, (https://www.youtube.com/watch?v=l3QQQu7QLoM&t=2s)

I travel back in time when I look at the stars on a moonless night.

How many of these lights have already gone out, even though we can still see them from Earth? They are so far away that we see them as they were a very long time ago.

NASA detects the explosion of a galaxy and it turns out to be a past event that I observe after the fact from my own present.

There is no real time.

When I look in the mirror, the person I see reflected is me but a few nanoseconds earlier; this is the time it takes me to travel the distance that separates me from the mirror.

I reflect on longevity: in 2013 they found a bivalve in Iceland that was 507 years old. It couldn't live another year, because they killed it to be able to calculate how old it was.

I normally multiply the age of dogs by seven to know the human equivalent, but by what number should I multiply mine to find my bivalve equivalent?

They tell me a fly lives for one day. It must be a very intense day, an entire life.

And no doubt my entire life must be a day for someone else too, someone who clearly doesn't have human form.

Humans have a life expectancy roughly similar to that of the golden eagle, about 80 years. Turtles outlive us, and sea sponges up to 10,000 years old have been found in Antarctica.

I raise my glass, toast to non-real time and think about how long the fleeting can seem.

For example, not long ago I rekindled my interest in shortwave radio. I am fascinated by being able to hear voices from the ends of the planet, languages I don't know, strange music... but when I turn the dial to an area where there is no station tuned in, the distant past assails me again: that noise in the speaker that seems to be frying is the microwave background radiation.

The radio has captured what is known as the echo of the Big Bang, the radiation that continues to expand throughout the universe since the primordial explosion. And I listen to it now, from home, on the shortwave radio. It is a Noise concert from 13,000 million years ago.

And I end up thinking that what is far away, sooner or later, will come closer. And I suppose it won't seem so old to us when it catches up with us.

I get up from the table. It has been good to meditate on these things, but I have urgent tasks. I have to sweep the house. And with a broom and dustpan, I begin to collect the dust. The dust comes mainly from the disintegration of meteorites in the atmosphere, and from the friction with the long tails of meteorites. Billions of particles that result from the disintegration of these mineral objects that before colliding with our atmosphere moved through space with the loneliness of something that never stops. And I sweep them up with a broom! I spend my life sweeping up their remains while listening to the echo of their initial explosion on the radio.

While I'm preparing the house for dinner, I decide to play a record. I put the needle in the groove and *Blasé*, by Archie Shepp, plays, a recording made in Paris in 1969. The sound record of something that happened forty-seven years ago.

Made live in the studio, the recording captures the natural reverberation of the room and allows you to imagine the space where they play, and to be caught in the atmosphere of the meeting of those extraordinary musicians.

And its message travels through time.

In fact, it is happening right now in my house.

This fragment of time is part of history; it was captured, retained and preserved through an analogue process: sound recording. And all this thanks to the invention of the phonograph, which has had colossal significance, comparable to that of the printing press.

But the phonograph is still a very simple invention: a cylinder that rotates around an axis. The cylinder is covered with a material that is soft enough for the action of a needle to be recorded on it, but hard enough for the groove of the needle to remain: for example, tin, wax or paraffin.

Imagine that we speak inside an acoustic hood at the end of which there is a needle in contact with the cylinder and we rotate the cylinder constantly. The needle will leave an irregular groove engraved on the surface of the material: it is the physical impression of the voice vibrations captured by the hood and transmitted to the needle. To listen to what is recorded, you only need to place the needle in the groove and rotate the cylinder. The vibration that the needle captures will be transmitted to the hood and we will be able to hear our voice.

If you think about it, it is a short way from Edison's invention to the current record player. Technology has allowed this simple yet effective thing to be perfected.

But I wonder from what point an invention of this type could have been feasible?

It is as if the phonograph could have been invented long before the 19th century. Accounts collected by historians about extraordinary engineering developed in other times have come down to us. The Byzantine Empire produced automatic devices and mechanical sound sources, as has been documented. Centuries later, Hero of Alexandria would create door-opening systems and automatic vending machines, in addition to playing music without performers in temples.

Who knows if, among the mechanical wonders that wars have made disappear, in addition to metal songbirds and wine-pouring automatons, there might not also be a recording device, destroyed without knowing its purpose. Or perhaps it is still hidden in the basements of a museum.

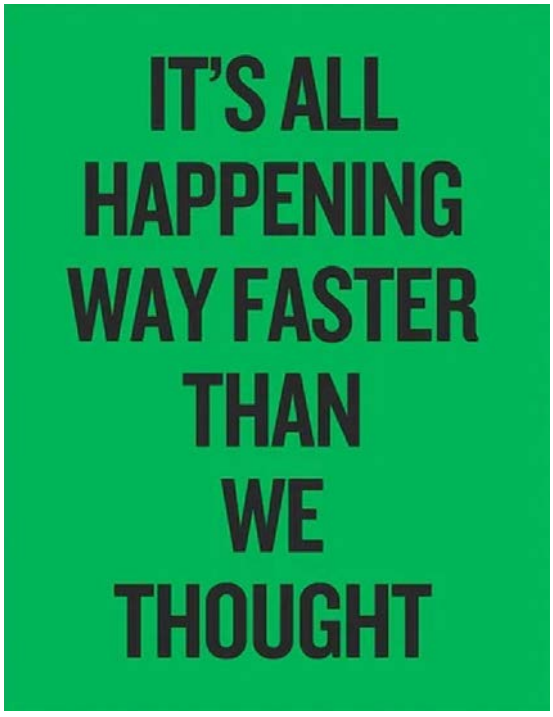
When Edison managed to record his song *Mary Had a Little Lamb*, in 1877, his partner John Kruesi asked to record something in German as well to verify that the device was not only capable of doing so in English.

The border between magical thinking and scientific thinking was still tenuous.

It is fun to revisit that phrase from Edison: "my invention has no commercial value". The inventor probably did not take into account that music is so

> important to humans that, within a century, the industry dedicated to preserving and reproducing it would become one of the most powerful on the planet. Music excites, provokes emotions, changes moods, moves... Who would give up the possibility of reliving it as many times as they wanted by simply placing a needle on a vinyl record? Who would reject reliving the past?
>
> What if I aim my thoughts in another direction? Do you think accidental sound recordings could exist? While I'm preparing dinner, I think about what object could have acted as a phonograph in the past, and I just happen to find it in the kitchen cupboard. I'm about to serve the salad in an old wheel-turned ceramic bowl.
>
> Could a potter's wheel work like a phonograph? When the craftsman finishes shaping the piece, he uses a burin or a needle, leaving a spiral groove. Let's suppose that his body acts as a sound box, and whatever he makes resonate, his own words, the sounds of the environment, the voices of others, or the noise of the wheel, would be recorded there. Once the piece is dry, if we use a needle and a phonograph cartridge, could we perhaps hear the sounds accidentally captured again?
>
> Even if it was just the sound of a stone turning thousands of years ago, it would be extraordinary, I think (Nubla, 2018: 7-21).

Víctor Nubla stops talking and we project this phrase from the piece *Slogans for the 21st Century* by Douglas Couplan (2011-2014):



How can we defocus our gaze to broaden our vision?
What makes us imagine new devices?
How many things have we missed in the study of the history of Humanity?
History is biased, we know, and with many black holes, as many as in the universe.

We see on the screen the video recorded with a mobile phone of a spider weaving a web (https://www.youtube.com/shorts/BEEkY_h5s54).

We attempt to look towards the smallest thing in the universe and, when asking ourselves these questions about the supposed advancement of technology, we observe the silk thread that spiders secrete to weave their webs. An incredibly diverse and intelligent material, capable of reacting and changing its structure depending on the moment and the needs of the spider. We consider what it means for a material to possess intelligence and, of course, if weaving is perhaps the first of technologies.

We would now like to invoke Laura Tripaldi, a writer and researcher, who talks about weaving as one of the forgotten human technologies.

To invoke her, we use a question she poses in her book *Parallel Minds*: "Do our technologies belong to us, and can we therefore use them to change what seems wrong and unjust in nature, or are they divine forces which, like the fire of Prometheus, we may borrow, but must always handle with sacred reverence?" (Tripaldi, 2022: 16).

While she talks, we will project the video *Envisioning Chemistry: Chemical Garden II*, by Wenting Zhu, where we see the osmotic crystallisation of six salts, while we are inspired by the chemical gardens of Stéphane Leduc.

And Tripaldi says:

> When we think about the history of technology, weaving is probably not among the first things that come to mind. And yet weaving has had an incalculable impact upon human civilisation: from the production of clothing to the birth of modern programming, this technology has accompanied human history as a silent presence, intertwined with the life of every one of us.
>
> The oldest traces of woven fibres among *homo sapiens* are known to date back more than twenty thousand years, to a time well before the birth of agriculture [...]: a recent study has revealed the discovery of a woven fragment attributed to Neanderthal man, which would take weaving back as far as ninety thousand years.
>
> Elizabeth Wayland Barber, an archaeologist and expert in the history of weaving, argues that widespread ignorance of this fundamental aspect of the history of technology owes largely to the perishability of fabric fibres, physical traces of which are easily lost with the passage of millennia.
>
> This then is also the reason why, when we imagine technologies of the past, we think of hard materials such as stone and metal, while fabric, by its nature soft and organic, ends up being almost completely forgotten.
>
> The selective forgetting of the past, so evident in the case of perishable materials used in antiquity, has much to teach us about the way we think about the technologies of the present and imagine the technologies of the future. Because the materials we use are not passive objects but, on the contrary, are determined by our socio-cultural life and in turn determine our relationship with the world, forming what is called *material culture*: a culture that is shaped by the invention, production, and use of the materials around us.
>
> We must always keep in mind that the materials we use on a daily basis say a lot about our culture, and that our cultural perspective is a determining factor

in the choice of materials with which we build our world. When we look at a fabric, we usually don't see it as a technological object, because its flexibility and softness do not fit our mechanistic image of technology based on rigid, hard materials that can survive for tens of thousands of years; yet in terms of complexity and adaptability, fabric is a far more advanced material than a piece of metal.

The same prejudice that has influenced our perception of prehistoric technologies as nothing but a collection of sharp stones — and has made us neglect fine weaving, food preservation, and pigment preparation — also comes into play when we imagine a future based on steel and silicon.

It is possible, indeed it is certain, that we will have to learn to make our technologies softer and more flexible if we are to have any chance of overcoming the challenges that lie ahead. At a time when we are obliged to reflect upon our impact on the planet, an impact so great that it has become geological, our best technologies will be those that leave no trace.

Perhaps another reason why we so rarely consider weaving is that it is an essentially feminine technology. A very common prejudice would have it that the techniques women have developed and kept alive since the dawn of our civilizations are not real technologies; instead they are treated almost as inexhaustible and mysterious natural resources; they are seen as the result of innate tendencies, their existence is taken for granted and, too often, their complexity is underestimated.

The Jacquard loom, designed in 1801 [...], is widely regarded as the first programable Machine ever designed, and used a system based on perforated cards surprisingly similar to those used more than a century later in the first computers. [It] inspired [...] Ada Lovelace, who [...] developed the project for a computational machine [...] capable of performing any algebraic work.

The fact that the loom was the model for modern computational machines highlights a fundamental feature of complex matter, namely that its structure can store a certain amount of information which is not imparted from the outside, like words inscribed onto a piece of paper, but is 'written' in the relationships between the microscopic elements that make it up. In other words, as in the case of fabric, the strength of our most innovative materials lies in their *cooperative* and *relational* nature, which is expressed in a diffuse and decentralised structure endowing the material with properties that its individual parts do not possess.

If we are to imagine a different future then our ideas about technology will have to change accordingly. In my view, it is not a question of accepting or rejecting technology en bloc; those who raise the question in these terms overlook the fact that technologies are plural, and that there are infinitely many ways to relate to the materials around us better than we have traditionally done. And this means first of all rethinking the materials with which we build our lives so that they are increasingly intelligent, i.e. flexible and able to enter into dialogue with their environment. (Tripaldi, 2022: 9-12; trad. 2022)

We project this image from the piece *Slogans for the 21st Century* by Douglas Couplan [2011-2014].

How can we make technological materials weave new ways of relating to us? What would softer technologies look like?

We play this advertising video introducing the robot Paro (https://www.youtube.com/watch?v=YR52xqkI78g).
Do you believe that objects have feelings?
Do you believe in the death and rebirth of things?

BLACK BOX

The metaphors we use to talk about things are part of the things. Or we end up being part of them. The black box is a central metaphor for the performing arts. The black box represents the emergence of modern theatre from the stage space, a break with horseshoe-shaped stands and stages with red curtains and gold mouldings, where it was more important to observe and show off to the rest of the audience than to concentrate on the show itself (Bishop, 2024: 91-92).

The black box will seek austerity and maximum concentration on the most essential aspects of the theatrical event, often the actor's body. It is not by chance that it was 1968, when students occupied the Théâtre de l'Odéon in Paris, the year when Peter Brook published *The Empty Space*, and Jerzy Grotowski, *Towards a Poor Theatre*.

It is also no coincidence that it was also in the 1960s that the concept of "black box" became a central expression in the field of cybernetics, just when digital technologies were experiencing their first great boom.

As defined by the main names of the cybernetic movement, such as Norbert Wiener (1965), a black box is a system that transforms an input into an output, without offering us any explanation of how the process works. Every time we press a key and see a letter appear on a screen, we are witnessing the

operation of a black box, because we are almost never interested in analysing how things work, as long as they do.

As sociologists such as Bruno Latour (1999: 219, trans. 2001) observe, technology is almost always based on the creation of black boxes that facilitate our daily interaction with them; in other words, at the root of technologies there is always a gesture of concealment, the masking of a process, and this has meant and still means that technology is often indistinguishable from magic.

Leaving aside their differences, this shared metaphor offers us a glimpse of a reciprocal influence between technology and spectacle; as technology becomes miniaturised, automated and increasingly conceals its internal processes, not only computational but also its energy or mineral requirements, theatre becomes increasingly autonomous, ordered and systematised. Within the black box, the dispersed sociality of street theatre or the social flirting of bourgeois theatre will be transferred to peripheral spaces, bars, lobbies and foyers, because the darkened stalls and the illuminated stage will demand the maximum attention of the audience: a change that involves the arrival of artificial lighting on stages, first with gaslight and then electricity.

Perhaps the double meaning of the metaphor of the black box (theatrical and technological) is pure coincidence. Perhaps it is also a coincidence that, in the 1970s, Apple adopted white as its corporate colour, at the same time that performing arts avant-garde was breaking away from the black box to perform in the white cubes of contemporary art museums. Or, that in the same years, the term "performance" experienced a boom, partly to talk about art and, partly, about the effectiveness of computers (McKenzie, 2001).

We project the image of a Macintosh computer advert from 1990.

Coincidentally or not, the transformations that live art and digital technologies have undergone since the second half of the 20th century have progressed in parallel. The same freedom that set designers like Fabià Puigserver instilled in the design of adaptable, reconfigurable and modular black boxes had a computer correlate in the form of intuitive graphic interfaces that were increasingly easier to use. Just as material culture organises what we can imagine, it is itself an effect of our imagination.

Today, we have seen how the computer screen can now be used directly as a stage box. And, at the same time, as a writing space, editing studio, drawing platform or tax domicile. Black boxes contain what we don't know, but they can also end up imposing limits on what we can come to know. That is why we want to end with the suggestion of an invitation to open them, to question how and why we do what we do and imagine what we imagine. Perhaps live art has the capacity to make us experience other metaphors and other meanings of uncertainty and technologies, which are still ways of thinking about what we can do together. To relive the feeling of magic, even if we can see the trick. Or, as Tripaldi would say, to imagine other technologies that are not limited to steel and silicon computers. Or, as Nubla invites us, to feel the relativity of time and listen to the voices of the past that still speak to us about the future today.

As a final invocation, we place our hands near the antenna of a theremin to the sound of the ghostly words of Jaume Melendres.

> I think everyone will agree that, since that memorable summer of 1976, or the summer of that famous Grec theatre festival, many things have happened on Catalan stages. Profound transformations have occurred, sometimes voluntary, sometimes predictable, and other times also involuntary or unpredictable. And perhaps the time has come to stop for a moment, or without stopping, to do what in the world of theatre we call an aside, to try to see where we are, where we have come, and, above all, where we would like Catalan theatre to go. But it is not a question of making predictions in a vacuum, predictions that will surely not come true. After all, the future is not abstract. The future is the reality of tomorrow of very specific people. Specific people like the ones we have here today, who are making theatre and who will most certainly continue to make it. They hold the future of Catalan theatre in their hands, or at least an important part of it (Melendres, 1986)

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