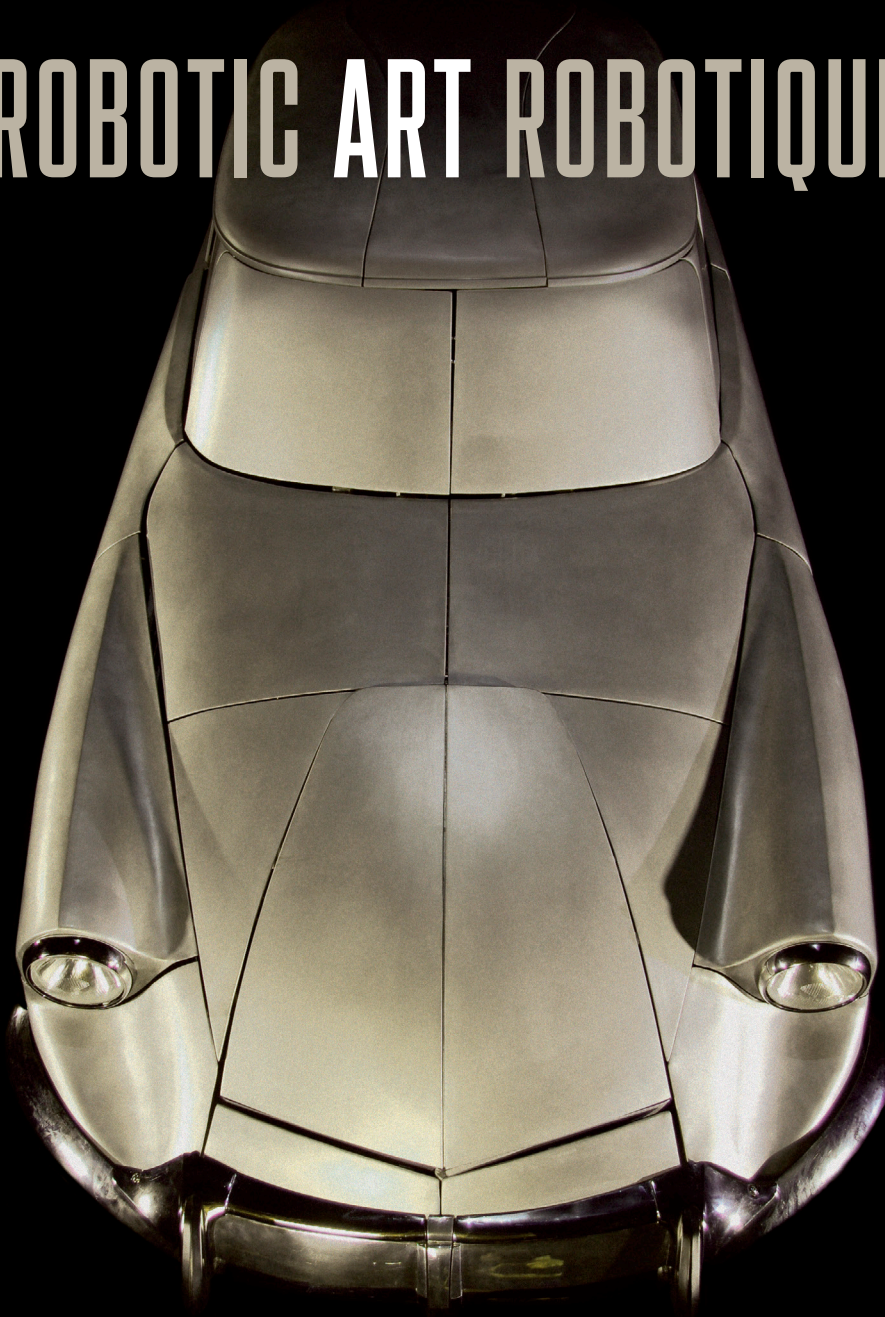


# ROBOTIC ART ROBOTIQUE



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## **ROBOTIC ART ROBOTIQUE**

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## WHAT IS ROBOTIC ART?

Discover a spectacular world of invention and wonder.

When artists use robotics it is not so much to design robots as to transform the natural world. Giving pride of place to impressive and sometimes monumental works of art, like the twenty installations and performances featured in this catalogue, they strive to dissolve the boundaries between art and science. Take Chico MacMurtrie / ARW's *Totemobile*, which looks like a well-known make of car but is actually a sculpture concealing fifty interdependent machines that unfolds to form an 18-meter-high organic totem made of metal and inflatable components. Or consider the work of Dutch artist Theo Jansen, like *Animaris Adulari*, *Animaris Umerus* and *Animaris Ordis*, three of his autonomous giant beach creatures that resemble mammoth skeletons and are impelled by wind. According to their creator, "the walls between art and engineering exist only in our minds."

Besides the course of the exhibition, the catalog includes a panorama on the mechanical and humanoid creatures, unpublished in English, "Artist and robot: A brief history of a relationship" by Gottfried Hattinger, former artistic director of the *Ars electronica* festival at the Brucknerhaus in Linz (Austria).

With the artists and collectives

**JEAN MICHEL BRUYÈRE / LFKS**

**SHUN ITO**

**THEO JANSEN**

**LU YANG**

**CHICO MACMURTRIE / ARW**

**MAYWA DENKI**

**TILL NOWAK**

**CHRISTIAN PARTOS**

**ROBOTLAB**

**SHIRO TAKATANI**

**TROIKA**



## ROBOTIC ART: A MONUMENTAL EXHIBITION

is an 1,600 square meters exhibition designed and produced by the Cité des sciences et de l'industrie (Paris), in collaboration with Epidemic, from April 8<sup>th</sup> 2014 to January 4<sup>th</sup> 2015

Artistic Curator  
Richard Castelli

**Strong advertising campaign around the exhibition, and display in Ile-de-France during 9 months.**

**Very impressive artworks revealed for the first time in Paris, during 8 months.**

**An interdisciplinary subject mixing "art and science", techniques and contemporary mythologies.**

# JEAN MICHEL BRUYÈRE / LFKS LE CHEMIN DE DAMASTÈS

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## LE CHEMIN DE DAMASTÈS

*mortiferum uniformitatem*

2006-2008

21 lits médicaux sonores et synchronisés  
Couvertures et oreillers blancs  
Tubes fluorescents  
Bande-son

Quelque part sur la route de Mégare à Athènes, Polyèmon, surnommé Damastès (le dompteur), connu aussi sous le nom de Procuste (Προκοπότης/Prokroústēs, celui qui martèle pour allonger), possédait un lit sur lequel il invitait ou forçait les voyageurs à s'étendre. Aux plus grands d'entre eux, Damastès coupait les pieds, les jambes, pour ajuster leur taille aux dimensions du lit. Des plus petits, il étrait les membres jusqu'à ce qu'ils aient atteint l'exacte mesure du lit.

Dans la tradition et l'ancien usage, le lit n'est pas seulement le lieu du repos, de régénération et de mort; il est le corps symbolisé.

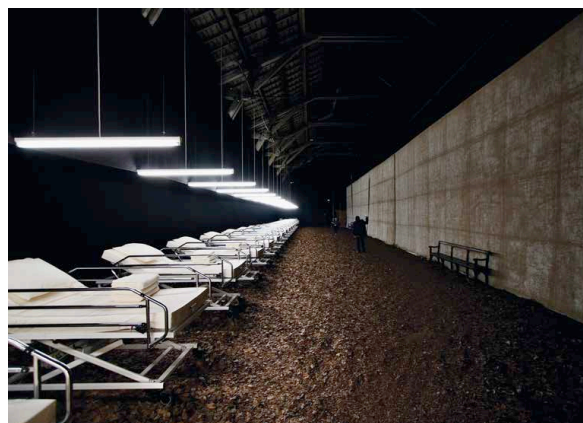
Jean Michel Bruyère / LFKs  
Martine Brunott, Nadine Febvre, Charles-Édouard de Surville

lfks.net  
[epidemic.net/fr/artist/bruyere/index.html](http://epidemic.net/fr/artist/bruyere/index.html)

13 21 hospital beds, wired for sound and synchronized  
White bedding  
Fluorescent tubes  
Soundtrack

Somewhere on the road from Megara to Athens, Polyemon, nicknamed Damastes ('the tamer'), also known as Procrustes (Προκοπότης/Prokroústēs, 'who beats to extend'), had a bed on which he invited — or rather forced — travellers to lay. If they were too tall, Damasta chopped off their feet and legs until they fit the bed; if too short, they were stretched to fill the space precisely.

In traditional and ancient usage, the bed does not only represent a place of rest, rejuvenation, and death; it is a symbol of the body itself.



# CHICO MACMURTRIE / ARW TOTEMOBILE

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## TOTEMOBILE

Totemobile is a robotic sculpture that initially appears as a life-sized representation of the culturally iconic Citroën DS automobile. In performance, this familiar figure is visually exploded, subverted and elaborated through various levels of abstraction until it reaches its final form: an organic 18 meter-tall totem pole. Upon reaching its full height, the work blooms with light, in the form of multiple organically-inspired inflatable sculptures suggesting the final maturation of an enormous biological organism.

The initial form of the robotic sculpture is surprisingly simple, and belies the existence of nearly 60 interdependent machines of varying aesthetic and functional purposes. As the sculpture opens and rises, these metal and inflatable machines give voice to varying modes of mobile abstraction, which develop throughout the growth and final "blooming" of the full, 18 meter tall work.

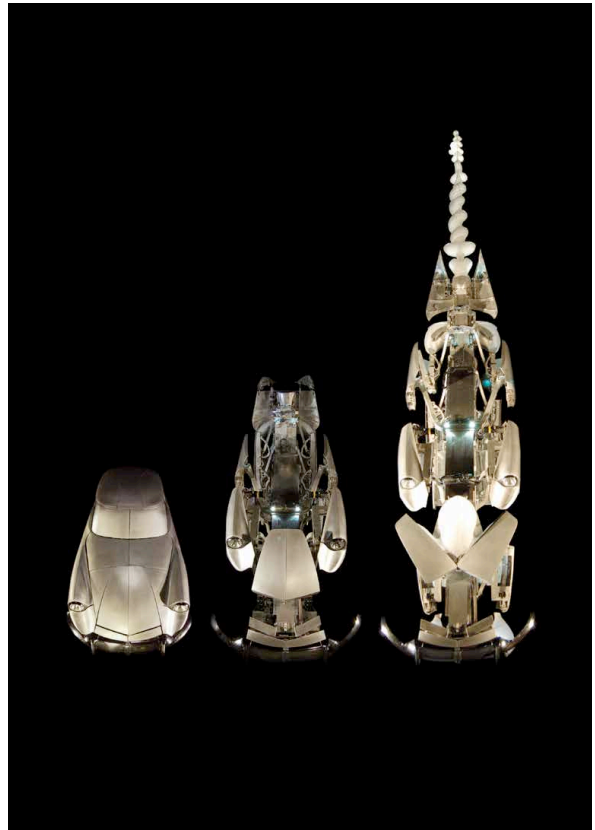
As the familiar structure visually decomposes into its constituent geometric parts, each part becomes a more organic version of the original, and eventually lends its decomposing body to support the life of the new organism it harbors. This automobile's point of natural transcendence lies in its inflatable airbags: in protecting and distancing its unrelenting synthetic body from us, the inflatable provides a point of direct contact with biological frailty. This point of contact provides the "crack", which harbors the germ of the unassailable automobile's biological aspirations. The Citroën becomes fertile ground, which this growing inflatable seed covertly consumes, co-opting and subverts for its own needs — the new thriving body yielding where required to insure the viability of its new-found skeleton, the comfortable and utilitarian form of the Citroën DS leaving its pedestrian servitude and stretching to achieve the organic beauty and flexibility more subtly suggested in its original architecture.

The form of the totem pole is narrative in nature. As the sculpture rises, multiple narratives unfold. In the collision, negotiation and compromises reached between the organic and the inorganic aspects of it, narratives suggesting entropy, domination, transformation, mortality and the nature of strength are exposed.

Once the resulting half-breed reaches its full mechanical height, the inflatables finally bloom brightly into view in a moment of hybrid ecstasy, and the mechanized lid opens revealing the new growth of an organic stamen. This sign of the fully-mature organism extends further into the sky as it seeks the sun. Taking large inflating breaths, it increases in strength and size. The elaborate organic machine assimilates and conforms to its architectural confines, as if it were using the limited space the building provides to support its own growth — reminding us of a tenacious growing ivy.

After 20 years of practice using robotics, seeking to create metaphors with machines, and emulating the human condition, MacMurtrie's Totemobile is the first of his sculptures that attempts to drastically change the direction his work has taken by engaging popular culture. Totemobile is a hybrid of an iconic symbol of popular culture and the notion of organic aspiration. It is a car that makes a biological journey upward, instead of the culturally and mechanically familiar forward and reverse. In our comfort with cars, we are invited on that journey with Totemobile, reinspiring awe in the nature that has sheltered and conveyed us, long before the appearance of the automobile.

In using robotics to explore the natural world's growth and transformation, MacMurtrie and ARW (Aesthetic Robot Works) use means which are, at first sight, vastly divergent from their subject. This apparent collision of incongruous matter highlights the unexpected appearance of an elaborate robotic device, whose sole purpose is its own living, and calls our attention back to the substance and priority of those basic biological systems of which we are a part. Systems whose fecundity and adaptability MacMurtrie's work in robotics both emulates and envies. Our creations in this world strive for an endurance and resonance so far achieved only by nature Herself. By moving away from the idea of longevity through unsustainability, toward finding it in interconnection, interaction, and adaptability, perhaps we can express a higher form of intelligence in our own creations.



# ART ROBOTIQUE : UNE EXPOSITION MONUMENTALE

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«Les murs entre l'art et l'ingénierie n'existent que dans nos esprits.»  
Theo Jansen

Dans le cadre de sa programmation «art et sciences», la Cité des sciences et de l'industrie présente **Art Robotique** en collaboration avec Epidémic. Une dizaine d'artistes ou collectifs d'artistes internationaux et une vingtaine d'œuvres spectaculaires et dynamiques sont exposés sur 1 800 m<sup>2</sup> ainsi qu'**Animaris Adulari** de Theo Jansen et **Totomobile** de Chico MacMurtrie qui sont installées dans le hall du musée et sur la passerelle du premier étage. La plupart de ces œuvres sont présentées pour la première fois en France et, pour certaines, il s'agit d'une première mondiale.

Les arts robotiques s'insèrent dans un paysage artistique contemporain très vaste qui inclut les arts médias, l'interactif, la numérique et les technologies robotiques ou automatisées. L'expression «art robotique» recoupe donc des pratiques très diverses qui ne peuvent être réduites à une imitation du corps, comme c'est le cas pour les robots androïdes.

Les œuvres présentées dans l'exposition s'inscrivent dans une longue histoire qui remonte à l'Antiquité et traverse toutes les formes artistiques jusqu'à nos jours. Durant toutes ces époques, les innovations dans les divers champs de recherche ont été adoptées, transformées, détournées par les artistes. Et rappelez-vous, dans l'Antiquité, les Grecs ne distinguaient pas l'art de la technique, car, pour eux, quel que soit le domaine dans lequel on exerçait (artistique ou technique), il s'agissait d'une seule et même chose : la *techné*.

Les artistes-ingénieurs d'Art Robotique empruntent à la science et à la technologie certaines avancées qui questionnent notre société actuelle. S'affranchissant de la simple représentation humaine, ils puisent leur inspiration dans la biologie, la physique, les neurosciences mais également dans l'histoire, l'économie ou la sociologie.

Leurs œuvres, entre imaginaire et réel, fascinent, elles nous boussulent et nous établissent parfois : n'est-ce pas le propre de l'art de nous faire voyager dans l'imaginaire d'un autre que soi ?

Cité des sciences et de l'industrie

## ROBOTIC ART: A MONUMENTAL EXHIBITION

"The walls between art and engineering exist only in our minds."  
Theo Jansen

In the framework of its Art and Science programming, the Cité des sciences et de l'industrie in collaboration with Epidémic presents **Robotic Art**. The exhibition comprises the work of a dozen individual artists and collectives and nearly twenty spectacular dynamic pieces in a 1,800-square-meter space, as well as Theo Jansen's **Adulari** and Chico MacMurtrie's **Totomobile**, on view in the entrance hall and on the walkway. The majority of works are being shown for the first time in France or in Paris and for some of them this exhibition is a world premiere.

Robotic arts belong to the very vast contemporary art scene that includes media, digital, and interactive arts, and, of course, robotic or automated technologies. The expression "robotic art" covers a wide variety of practices that are not limited to robots imitating human bodies, as is the case for androïds.

The artworks on view in **Robotic Art** belong to a long tradition that runs through all art forms since Antiquity to our day. In all periods artists adopted, transformed and put to their own specific use innovations in various areas of research. Interestingly, the Ancient Greeks did not draw a distinction between art and technique: whether the activity was what we would call today artistic or technical, to them it was one and the same thing: *techné*.

The artists-cum-engineers in **Robotic Art** sometimes borrow advances in science and technology in ways that question our society. Freed from simple human representation, they draw inspiration from biology, physics, the neurosciences, history, economics, and sociology.

Their works straddle the imaginary and the real world in ways that are engaging and challenging, and also sometimes unsettling. But isn't it the nature of art to take us outside ourselves on a trip into the imagination of others?

Cité des sciences et de l'industrie

# ART ROBOTIQUE : DE LA TRANSFORMATION

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**Art Robotique se veut un regard sur le principe de la transformation dans certaines formes d'art, transformation rendue plus aisée par l'usage de technologies principalement développées de la seconde moitié du siècle dernier à nos jours : l'électronique, l'informatique, la biologie et la robotique.**

Toute œuvre d'art, même celle supposée «fixe», telle qu'une peinture ou une sculpture, est sujette à transformation. Elle se transforme dans l'œil de son spectateur, suivant les évolutions de celui-ci et les différents états de la perception qu'il en engage. Aussitôt qu'approchant l'œuvre et d'autant loin qu'il l'aperçoit (ou la perçoit), le spectateur la met en mouvement. Que l'œuvre elle-même bouge ou non, le spectateur l'intègre dans son mouvement à lui. Et ainsi elle change, elle se transforme de ce mouvement-là. Elle devient plusieurs œuvres, les unes après les autres. Il y a l'œuvre d'une première vision globale, il y a l'œuvre du très proche, du détail, il y a toutes celles jalonnant l'aller du plan général au très gros plan et toutes celles enfin de l'éloignement — le retour —, attendu que l'œuvre vue dans son ensemble faisant suite à la perception du détail, ne sera pas la même que celle découverte pour la première fois par le spectateur. À chacune de ces étapes successives l'œuvre est «revue», sa perception, corrigée. L'œuvre est transformée, se transforme.

Cette transformation intervient aussi dans l'évolution de la perception de la couleur et de la lumière lors de sa vue prolongée. C'est du moins ce que décrit, entre autres, Kandinsky dans *Du spirituel dans l'art* et dans la *peinture en particulier* (1912).

Selon Bergson, pour qui il n'était rien que mobilité et transformation et qui a tenté d'analyser dans son *Essai sur les données immédiates de la conscience* (1889) le rôle de la durée dans la perception, la transformation de l'œuvre est en mouvement permanent dans le temps de la voir vue et le temps de l'avoir vue. Mais le temps qui passe ne transforme pas que notre conscience de l'œuvre, il la transforme aussi dans sa matière : il l'alère, il «la rend autre». La patine ou la franche détérioration d'une œuvre ancienne, quand elles apparaissent, deviennent indissociables de sa perception. Le plus souvent, sa restauration ne fera pas remonter l'œuvre dans le passé lointain. Au lieu de la figer dans son origine, elle projette l'œuvre violemment dans le futur. L'œuvre n'est donc pas restaurée, mais transformée, elle n'est pas arrêtée dans le temps ni ne peut le remonter, elle est seulement accélérée dans sa transformation et fait un bond en avant.

Cependant, la plus importante de toutes les transformations de l'œuvre fixe provient de la mutation des sociétés elles-mêmes qui fait qu'indépendamment de sa dégradation physique ou de sa parfaite conservation, qu'indépendamment du temps que l'on passe à la regarder et à quelle distance, une œuvre ne peut être vue, entendue ni ressentie de la même façon par les générations postérieures à sa création. Elle meurt en tant qu'œuvre d'art avec son contemporain, puis renaît sous la forme d'objet culturel, qui lui-même n'est pas davantage un objet fixe : il saura les mouvements de la perception qui traversent et transforment en permanence les cultures vivantes.

Art Robotique s'attache à présenter des œuvres dont la transformation est active et contemporaine de la visite de leurs spectateurs : des «œuvres à transformation».

## ROBOTIC ART: ABOUT TRANSFORMATION

**Robotic Art offers a look at the principle of transformation at work in certain art forms — transformations made possible by the use of technologies developed for the most part since the mid-twentieth century, particularly electronics, computing, biotics, and robotics.**

All works of art, even supposedly "unchanging" works like sculptures, are subject to transformation. They change in the eye of the beholder. They change as much with the viewer's position and situation as with the different states of perception to which they give rise. A work is set in motion from the moment a viewer approaching a work catches sight of it. Whether or not the piece moves, it is integrated into the viewer's movement. And it is, in this way, transformed by this very movement. It becomes several works, one after another. Between the work of art seen initially from a distant point of view and the work examined from very close at hand, there are all the intermediate steps, from the contextual view of the whole object to the extreme close up. Then there's the movement away — the return, so to speak — knowing that after perceiving the work in detail, it will not look the same from the initial position of discovery. The work is continually "re-viewed", its perception corrected at each step of the way. It transforms and is transformed.

There is also transformation at work in the perception of colour and light upon prolonged viewing. Kandinsky, for one, discussed this phenomenon in his *On the Spiritual in Art* (1912).

According to Bergson, for whom there was nothing but mobility and transformation and who endeavored to analyse duration's role in perception, the transformation of a work is in permanent motion in the time of seeing it seen and the time of having seen it. (*Essay on the Immediate Data of Consciousness*, 1889).

But passing time does not only change our consciousness of a work of art, it also transforms it materially; it alters it and "makes it other". When patina or rotent deterioration appear over time, they become indissociable from the perception of an old artwork. Restoration will not take the piece back to its original state in the distant past. Indeed, instead of congealing it in its origin, it hurls the work into the future. The work is not so much restored as transformed. Instead of being arrested or taken back in time, its transformation is accelerated and it takes a leap forward.

However, the most important of all the transformations in an "unchanging" work proceed from changes in society itself. Independently of a work's physical deterioration or its perfect conservation, independently of the time spent looking at it and the viewing distance, a work of art is not seen, felt, or understood in the same way by generations posterior to its making. It dies as a work of art with its contemporaries and is reborn in the form of a cultural object, which is in itself not an unchanging state. It will continue to follow the movements of perception that are constantly traversing and transforming living cultures.

The works featured in the **Robotic Art** exhibition integrate transformation as an active principle contemporary with the visit of museumgoers. They are what could be called "transformation-powered artworks".

# THEO JANSEN

ANIMARIS

Animaris Umerus

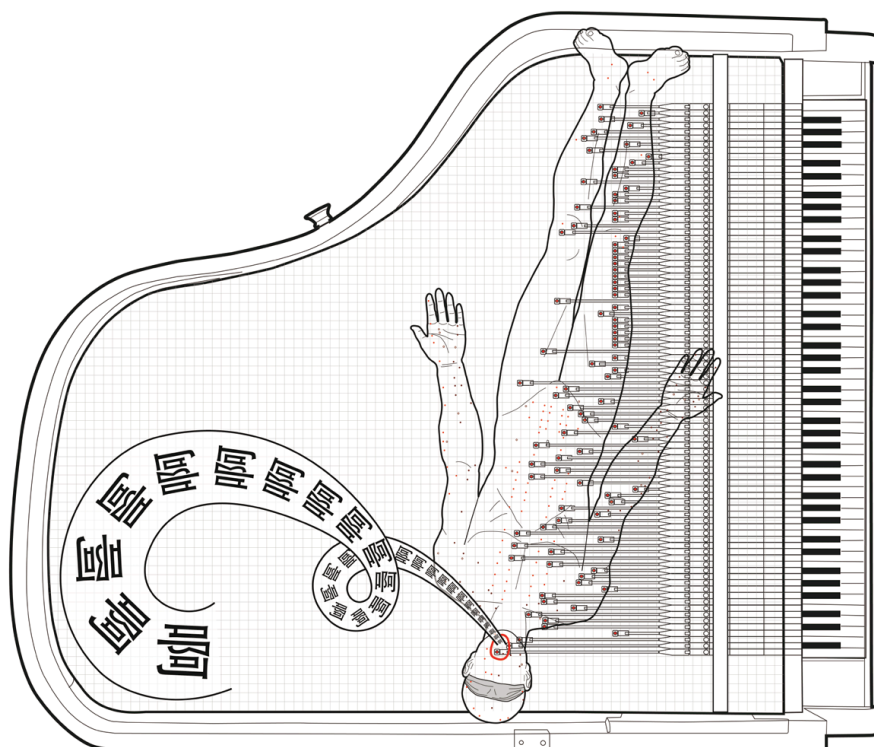


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# LU YANG

PROJET  
DE RECHERCHE  
DE COLLABORATION  
AVEC  
DES SCIENTIFIQUES

Instruman



22

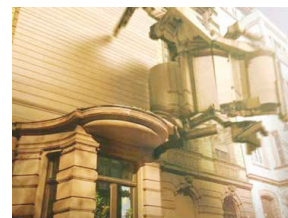
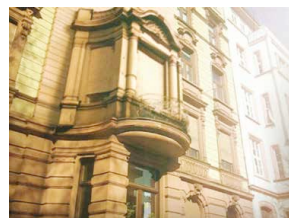
# MAYWA DENKI NONSENSE MACHINES

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The Centrifuge Brain Project

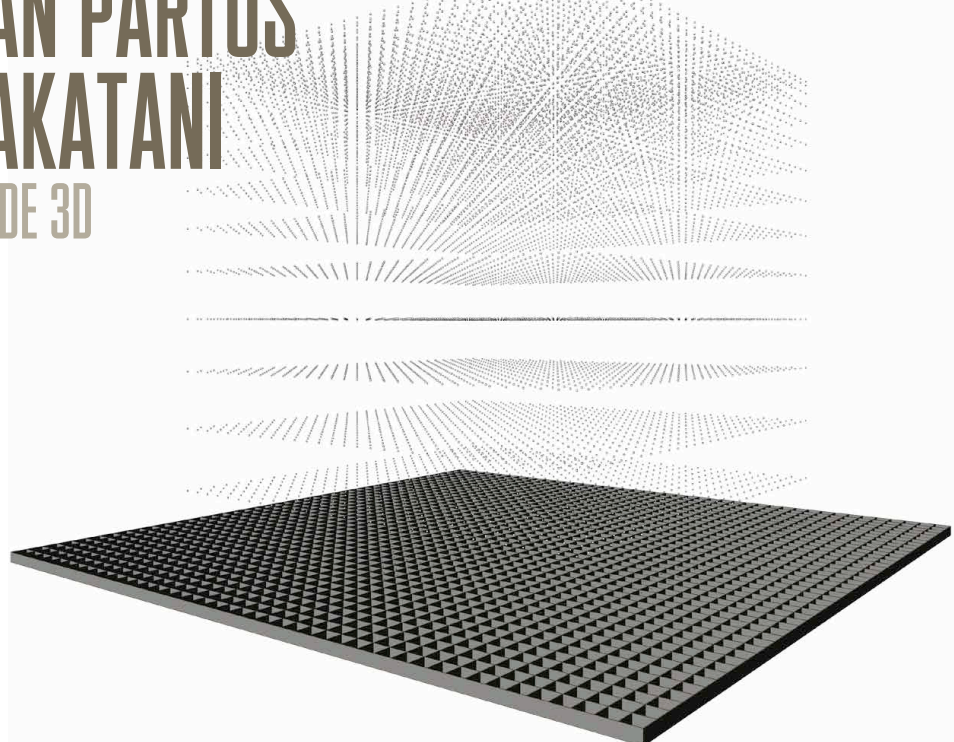
Unusual Incident: Windows Crossing the Street





# CHRISTIAN PARTOS SHIRO TAKATANI

## MATRICE LIQUIDE 3D



52

# L'ARTISTE ET LE ROBOT: BRÈVE HISTOIRE D'UNE RELATION

56

Les robots existaient dans l'imaginaire des mythes bien avant que les ingénieurs, les techniciens et les programmeurs ne s'occupent d'en construire. Les premières créatures artificielles ont vu le jour dans la littérature, ce sont des chimères témoignant de l'orgueil de l'homme qui veut s'imposer dans la création et s'élever à un statut divin. Une ambition qui remonte à des temps immémoriaux et qui n'a rien perdu de sa fascination aujourd'hui. Dans sa grande épopée L'Iliade, le poète Homère raconte au VIII<sup>e</sup> siècle avant notre ère l'histoire des vingt trépiers de « l'illustre artisan » Héphaïstos qui se mouvaient sur des roues comme des robots, trouvaient tous seuls leur chemin et « se rendaient d'eux-mêmes à l'assemblée des dieux ».

Le forgeron disgracié, trompé par toutes les déesses, finit par créer deux servantes en or, qui pouvaient penser et parler, et de plus rendre divers services obligés à leur maître et seigneur : « statues d'or, elles sont semblables à deux jeunes filles vivantes; elles possèdent l'intelligence, la force et la voix; les dieux immortels leur apprennent le travail ». Ainsi Homère inventa-t-il les premiers cyborgs de l'histoire de la civilisation.

Si nous continuons notre parcours sur la route des mythes, nous croisons une longue série d'androïdes et de monstres robotiques effrayants qui peuvent en remonter aux guerriers modernes de Star Wars et autres Terminator (R.A.) : le démon de bronze des Cures devait protéger le nouveau-né Zeus de son géniteur Cronos, qui cherchait à le tuer. Zeus ne leur en montra pour autant aucune gratitude lorsque son épouse Héra incita les Cures à enlever le fils que lui avait donné. Il foudroya Thyra à neuf têtes, réglant le problème une fois pour toutes : « ils ne mangent pas le pain, leur cœur était comme l'acier rigide » rapporta Hésiode. Le poète épique décrit aussi la perfide demande de Zeus, chargeant Héphaïstos de fabriquer une femme artificielle « de grande beauté », qui répandra tous les maux de l'humanité sur la Terre.

Afin qu'elle soit une parfaite imitation de l'homme, les gènes de divers dieux et déesses furent mis à contribution : Aphrodite, qui détient la beauté; Athènes pour l'habileté manuelle et le voyageur Hérès pour « la ruse et la fourberie, la parole séduisante et l'art de tromper ». Avec cette femme séduisante par qui arrive le malheur, le père des dieux et des hommes se vengea des méprisables mortels qui avaient accepté le feu de l'Olympe dérobé par Prométhée, et de ce fait la conscience et la culture. Prométhée, qui dut expier son méfait, mit en garde contre les cadeaux de Zeus. Mais son frère Epiméthée ne résista pas au charme de Pandore, qui ouvrit la fameuse boîte d'où s'échappèrent les fléaux de l'humanité, tous les maux, la mort et les maladies.

On retrouve le forgeron Héphaïstos avec la fabrication du géant métallique Talos (R.B.). Ce monstre fut offert par Zeus à son amante Europe pour la protéger en Crète. Talos était programmé pour faire le tour de l'île trois fois par jour et chasser les intrus à jets de pierres. Si un navire parvenait à atteindre la côte, Talos s'embrasait et étroitait les agresseurs qui n'avaient pas fui à sa simple vue. D'un point de vue technique, l'automate était

## ARTIST AND ROBOT: A BRIEF HISTORY OF A RELATIONSHIP

Well before engineers, technicians, or programmers began making robots, they were present in the imaginary world of myth. The first artificial creatures to appear in literature testified to the excessive pride of human beings who aspired to interfere with creation and to elevate themselves to the status of the gods. This aspiration goes back to time immemorial and has lost nothing of its fascination today. In his great epic poem The Iliad, from the eighth century before the Common Era, Homer tells of the "illustrious craftsman" Hephaestus who made twenty self-moving tripods that moved on wheels, found their own way, and entered the assembly of the gods by their own power. Deceived by all the goddesses, the disgraced blacksmith ended up creating two servants in gold, that could think, speak, and render a variety of services to oblige their master and lord: "These are golden, and in appearance like living young women. There is intelligence in their hearts and there is speech in them and strength, and from the immortal gods they have learnt how to do things." And so Homer can be said to have invented the first cyborgs in the history of civilisation.

If we continue our journey down the road of myths, we meet up with a long series of androids and robotic monsters that are no less intimidating than their contemporary counterparts in such films as Star Wars or Terminator (R.A.). There were the Kouretes, demons in bronze that were guardians of the newborn Zeus, assigned to protect him from his father Cronos who intended to kill him. This did not win them Zeus's gratitude, however, when his wife Hera had them kidnap the son he had with Io. Zeus struck down the Kouretes, resolving the problem once and for all: "they ate no bread and their hearts were tough as steel," Hesiod writes. Homer also describes Zeus's perfidious demand that Hephaestus make an artificial "lovely maiden" who would spread evil upon humankind. In order to make her a perfect imitation of human beings, various gods and goddesses contributed their characteristic genes: Aphrodite, gave her beauty; Athena, her manual skills, and Hermes the traveller, his "lies, coaxing words, and thieving nature." This charming woman who was to bring a "gift of evil" upon the world was the instrument of Zeus, father of all gods and human beings, to take revenge on the insignificant mortals who accepted the fire stolen by Prometheus from Olympus, and with it consciousness and culture. Prometheus, who was punished for his misdeed, warned against gifts from Zeus. But his brother Epimetheus could not resist the charms of Pandora, who opened the famous box from which death, illness, sorrow, and all the plagues of humankind escaped.

We come upon Hephaestus the blacksmith again in connection with the making of Talos (R.B.), a giant of bronze. Zeus gave this monster to his lover Europa for her protection in Crete. Talos was programmed to circle the island three times a day and drive away intruders by throwing stones at them. If a vessel reached the shores, he heaved himself until he was burning hot, whereupon he embraced any opponent who hadn't been frightened away just by seeing him. From a technical standpoint, the automaton had a single vital artery running from head to foot where it was sealed at the ankle. Only the wizard Medea succeeded in finding his weak point. When she severed his heel, the giant's vital source flowed out and the Argonauts were able to land on Crete without interference.

