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Exhibition

Press release

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#ExpoNeurons
#MutationsCreations

Neurons Simulated Intelligences

26 February – 20 April 2020

Gallery 4, Level 1

As part of Mutations / Creations #4

At a time when artificial intelligence is extending into all corners of modern life, the Centre Pompidou will, for the first time, be placing this phenomenon in the context of the history of neuroscience and neurocomputing with the exhibition 'Neurons, Simulated Intelligences'. Running from 26 February to 20 April 2020 as part of the fourth edition of the 'Mutations / Creations' series, the exhibition will highlight the ties between research by artists, architects, designers and musicians and the latest scientific and industrial advances.

The exhibition is organised around five main areas of research, each of them presented and defined according to historical fields of reference in the form of graphs, allowing a timeline of corresponding innovations and creations to be produced. The itinerary begins with the representations and images that constitute the collective imagination of cerebral life, contrasting them with research in the field of digital imaging and the concept of an artificial brain.

A second section underlines the abiding interest of the computing pioneers in games, all the way to the ultimate face-off between man and computer – the experiment in which the Deep Blue software beat chess player Garry Kasparov. Further on, a cyberzoo houses Walter Ross Ashby's and Grey Walter's tortoises, Shannon's mouse and Albert Ducrocq's electronic fox, presented as the forerunners of the steering systems of self-driving cars.

One section is devoted to neuroscientific investigations into the ideals of manipulating consciousness and extending cognitive capacities. Finally, the last part of the exhibition focuses on deep learning, or the processing of very large quantities of data by new types of neural networks, against the background of an archaeology of trees and diagrams, and the classifications that have been used throughout the ages to organise how we understand wisdom and knowledge.

Interview with Frédéric Migayrou

Assistant Director of the Musée National d'Art Moderne,
Head of the Design and Architecture Department at the
Centre Pompidou, Exhibition co-curator.

Excerpt from 'Code Couleur' issue 36
January – March 2020

— **What were the challenges presented by this exhibition?**

— **F.M.** 'Neurons, simulated intelligences' sets the latest creations – both technological innovations and industrial applications – in context, in a type of archaeology of artificial intelligence, over a fifty-year period. Through artistic works, the exhibition offers a critical take on technologies for simulating intelligence. It's all about demystifying the idea itself of artificial intelligence, which is all around us today, and causing it to come up against human intelligence through mechanical, machine and computer simulation. In order not to think of artificial intelligence as a fantasy concept, we need to understand it instead as something that is rooted in logic and mathematics. It is a long-running and ongoing story, which has reached the point today of built-in intelligence, in the form of aids to driving, for example.

— **How is the exhibition organised?**

— **F.M.** It is organised around five main areas of research, each defined according to historical fields of reference in the form of graphs, which provide a timeline of corresponding innovations and creations. It traces a genealogy of intelligence simulation. An initial graph features historical representations of the brain in the form of 50 images. So, visitors can see how the brain has been represented throughout the ages, and particularly during the Renaissance, in etchings and drawings. There's also a real brain in formaldehyde, and Raoul Hausmann's Mechanical Head, which prefigured the concept of mechanised thought. A second graph underlines the abiding interest of computing innovators in the logic of games (chess, Go, etc.) and its depiction in the form of decision trees. For example, we show the decision trees of Deep Blue, the first chess supercomputer devised by IBM and which beat champion chess player Garry Kasparov in 1997. This was the real turning point, the moment for which scientists had been waiting for more than a century, when the intelligence of a machine surpassed that of humans... We're also presenting the research conducted by DeepMind, the British company specialising in artificial intelligence founded by the neuroscientist Demis Hassabis and now owned by Google, which created the AlphaGo programme. They also developed the StarCraft online game, for example, which is well known among gamers. The exhibition goes on to chart the surge of interest in cybernetics and the development of mobile robots that could interact with their environment. We've called this the cyberzoo, as it's a collection of representations of cybernetic animals, notably those invented by Norbert Wiener and Claude Shannon, and which were, in fact, the first robots. There are ladybirds, mice, an electronic fox... We deliberately decided not to include anthropoid robots, because they're too closely associated with the idea of machines taking over human faculties.

The fourth graph deals with mind expansion and provides an overview of the research into cognitive faculties conducted simultaneously in the military and art worlds. On display, for example, are psychedelic works by Richard Aldcroft, the Mind Expander helmet by the Viennese group Haus-Rucker-Co, and the work of musician Alvin Lucier. The final graph focuses on the classification of knowledge in the form of trees and diagrams of neural networks, demonstrating how important the history of statistical simulations and logic has been in the development of artificial intelligence.



— **What part have artists played in all of this?**

— **F.M.** Artists are very much in the front line, because of their ability to experiment, invent and come up with alternative ideas for use – their capacity to be critical and innovative, essentially. The question is how can creative people appropriate these technologies, and the thought processes that accompany them, for their own ends. And also, how can they construct a critical discourse that will inspire the public, too, to question itself in relation to these technologies. We're showing Chinese videographer Lu Yang's work on the manipulation of the brain, as well as images by the photo-journalist Maxim Matthys, examining the misuse of facial recognition technology by China to monitor the Uighur people. AI applications like DeepFace are incredibly powerful tools, but their manipulation by totalitarian regimes could have dangerous implications.

— **Will the human brain really be deciphered one day?**

— **F.M.** We're not going to arrive at a complete understanding of how the brain works tomorrow or the next day. Even the Swiss scientists behind the ambitious *Blue Brain Project*, which seeks to simulate the brain, acknowledge that, despite the level of complexity they've managed to drill down to using hugely powerful computers, they are still a long way from being able to simulate intelligence models like those of the human brain.

Save the dates

Press opening

Tuesday 25 February, 10 am – 1 pm
Guided tour starting from 10.30 am

TV filming and radio interviews: Monday 24 February, from 10 am.
By appointment.

Seminars accompanying the exhibition

26 & 27 February 2020

Informations to follow.

Mutations / Creations #4

With "Mutations/Creations," the Centre Pompidou is transformed into a laboratory for creation and innovation at the interface between the arts, science and engineering. Each year the programme brings together artists, engineers, scientists and entrepreneurs. In 2020, "Mutations/Creations" continues its forward-looking research through two exhibitions, "Neurons, Simulated Intelligence," and "Jeremy Shaw, Phase Shifting Index" after three successful editions devoted to 3D printing ("Printing the World," and "Ross Lovegrove" in 2017), to computer languages ("Coding the World" and "Ryoji Ikeda" in 2018) and to creations that combine the living and artificial life ("Designing the Living" and "Erika Verzutti" in 2019).

Jointly presented with:
Jeremy Shaw, Phase Shifting Index
26 February – 20 April 2020
Gallery 3, Level 1

Practical Information

The Exhibition

Neurons Simulated Intelligences

26 February – 20 April 2020
Gallery 4, Level 1
As part of Mutations / Creations #4

Curators **Frédéric Migayrou** and **Camille Lenglois**
Head of Production **Dorothee Lacan**
Architect-Scenographer **Laurence Fontaine**

Mutations / Creations is supported by:

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#ExpoNeurons
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The Centre Pompidou

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Opening times and Admissions

Every day from 11am to 9pm [Thursdays until 11pm],
except Tuesdays and May 1st.

€15, reduced fare €12 / Free for those under 18. Young people under 26*, teachers and students at schools of art, drama, dance and music and members of the Maison des artistes may visit the Museum for free and buy tickets for exhibitions at the concessionary rate.
Free admission for Centre Pompidou members.

Online bookings and print-at-home tickets on:

www.billetterie.centrepompidou.fr

The reservation of a time slot applies to all visitors, except for those benefiting of a free admission.

* Nationals of Member States of the EU or the European Economic Area aged 18–25.
Valid the same day for the Musée National d'Art Moderne and all exhibitions.

At the same time

Yuan Jai
5 February – 27 April 2020
Museum, Focus Room

Chine-Afrique [China-Africa]
4 March – 25 May 2020
Museum, Gallery 0

Wols
4 March – 25 May 2020
Museum, Graphic Arts Gallery

Christo and Jeanne-Claude Paris !
18 March – 15 June 2020
Gallery 2