

Spain museum uses robot to spot cracks in artwork

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An employee of Reina Sofia Museum in Madrid at work in the restoration department on July 4. In the basement of Madrid's Reina Sofia museum, a giant robotic machine painstakingly scans a painting by Catalan surrealist artist Joan Miro, slowly snapping hundreds of microscopic shots.

In the basement of Madrid's Reina Sofia museum, a giant robotic machine painstakingly scans a painting by Catalan surrealist artist Joan Miro, slowly snapping hundreds of microscopic shots.

The pictures taken by the machine, which uses infrared and ultraviolet photography, will help experts determine the condition of the 1974 oil on canvas [painting](#) called "Women, Bird in the Night" in unprecedented detail.

The device lets restorers see cracks, scratches and creases as well underlying preparatory sketches and all subsequent touch-ups that would be otherwise undetectable.

"We can see countless details which we could not see with the naked eye," said Humberto Duran, 47, the restoration computer technician who oversaw the design of the [robot](#).

"With this Miro work we have already seen a series of touch-ups and stains that were completely hidden," added Duran, wearing a white lab coat as he sat before the computer he uses to control the machine.

The robot has been nicknamed "Pablito" since the first work it tackled was the modern art museum's top draw—Pablo Picasso's immense canvas "Guernica", a depiction of the carnage of the Spanish Civil War.

The machine, which is nine metres (30 feet) long and 3.5 metres high and weighs about 1.2 tonnes when it is assembled at its full size, took 22,000 pictures of Picasso's black-and-white masterpiece last year.



Humberto Duran of Reina Sofia Museum in Madrid monitors a robot taking pictures of a Miro painting on July 4. The robot has been nicknamed "Pablito" since the first work it tackled was the modern art museum's top draw—Pablo Picasso's immense canvas "Guernica", a depiction of the carnage of the Spanish Civil War.

Those images are currently being analysed by the restoration department at the museum, which received 2.5 million visitors last year.

Since then, the robot has been used on about a dozen other works, mostly by Miro, to help prepare an exhibition of works by the Catalan artist which will travel to the United States next year.

"We can know with great precision what state a painting is in, what its layers are like, what problems exist" or simply how the work was created, said the Reina Sofia's head of conservation, Jorge Garcia.

The museum, housed in a remodelled 18th century hospital which is home to works by Salvador Dali and Francis Bacon, teamed up with Spanish telecommunications giant Telefonica to develop the machine, which cost around 150,000 euros (\$195,000).

The robot moves with a precision of 25 microns, or 25 thousandths of a millimetre, and it can be programmed to take pictures from closer or further away from the painting depending on the shot needed.

Its design, according to Garcia, means that "no matter how many mistakes may occur, the device will never touch the painting".

The robot can work unsupervised round-the-clock and can be controlled by a computer from a remote location.

It was specially designed so that it could be assembled in front of "Guernica" and spare the delicate painting from having to make the risky move to the basement conservation laboratory.

In most cases though, paintings are taken to the lab to be analysed by the machine.

Museum art experts say the information the robot provides about a painting makes the job of restoring art works easier.

"It's a tremendous help. You have to know what you have before you work on it," said Carmen Muro, a 58-year-old chemist who works in the museum's restoration department.

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