

AUTHENTICATION IN ART

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Move over art critics! Computer algorithm reveals the most original masterpieces of all time

- The algorithm analysed 63,000 paintings for their originality and influence
- It analysed artist's painting techniques, styles, colours and subject matter
- Edvard Munch's *The Scream* and Pablo Picasso's work scored highest
- Creativity also seems to spike with abstract work at end of 20th Century

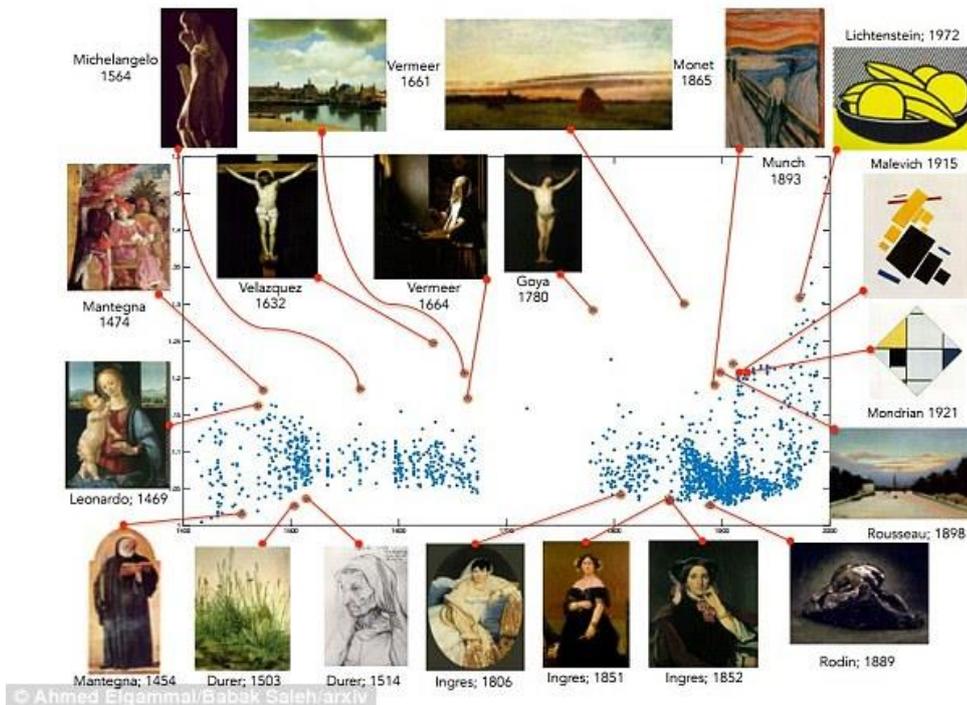
By [RICHARD GRAY FOR MAILONLINE](#)

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It is a topic endlessly debated by the art world, but now a computer program has produced its own list of what it believes to be the most creative paintings ever produced.

The algorithm, developed by computer scientists at Rutgers University in New Jersey, analysed 63,000 paintings and sculptures produced through out history for their artistic features.

It ranked paintings such as *The Scream* by Edvard Munch and Pablo Picasso's *Ladies of Avignon* as among the most creative ever produced, but abstract works by Fernando Caldau topped the results.



Computer scientists have used an algorithm to analyse 63,000 paintings and sculptures for their creativity by examining their colour, texture, use of proportion, perspective and techniques before comparing them to others from the same period. The graph above shows paintings that were most creative highest while those that were deemed least creative were lowest. The horizontal axis shows the date the painting was produced

Masterpieces by artists including Monet, Michelangelo and Goya also scored highly while paintings by artists like Albrecht Dürer and Jean Auguste Dominique Ingres did less well.

The programme examined visual features including colour, texture, proportion, perspective and use of contrast as well as techniques like brush strokes and even the subject matter. It then compared each painting to others produced during the same period to examine its originality.

While in some cases it agreed with art experts about the creativity of certain paintings, it also placed some highly valuable works low on its list.

THE HISTORY OF ART IS ORANGE

Orange is the most dominant colour used in artworks through out history.

Using computer analysis, researchers at the Karolinska Institute in Sweden analysed paintings available for download on the internet.

they then extracted the colour information from them and plotted it on a graph.

They found that orange is the most commonly used colour in art, but over time it has been becoming more blue.

The plot was based on 94,526 images for the years 1800-2000.

The graph shows a clear trend toward more blue paintings toward the end of the 20th Century, with all colours increasing except for orange.

Garden at les Lauves, by post-impressionist Paul Cezanne – who is considered to be one of the most important artists of the 20th century, was ranked particularly poorly.

Perhaps unsurprisingly the computer also singled out distinctive works that have come to typify more modern styles. Abstract art by Kazimir Severinovich Malevich scored highly as did work by contemporary artists like Roy Lichtenstein.

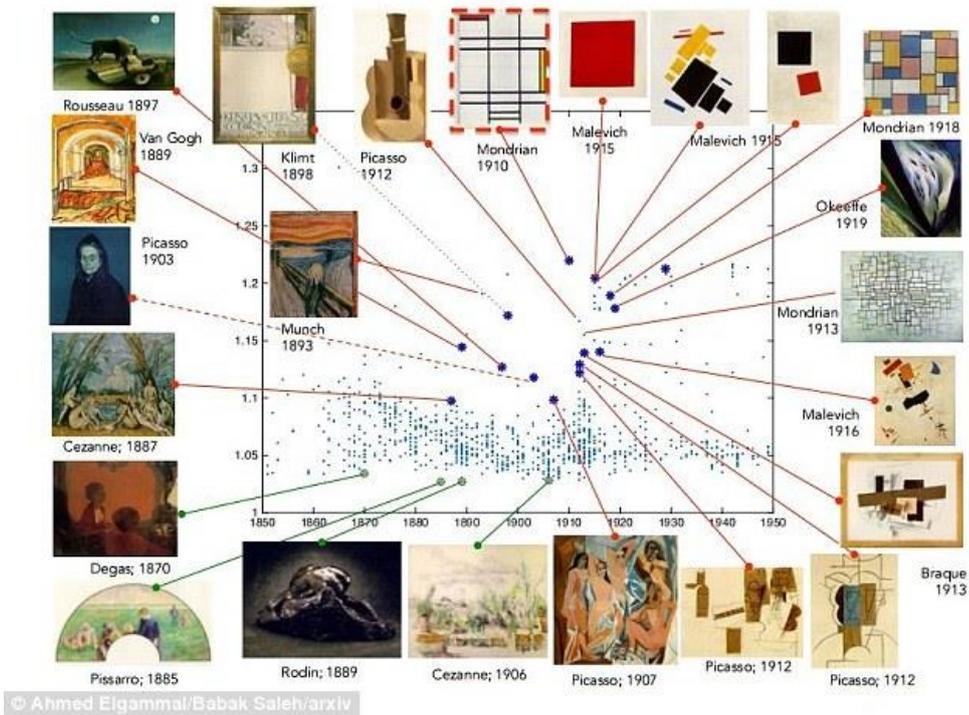
Writing in a paper published on the open science website arxiv.org, Ahmed Elgammal and Babak Saleh, who were the researchers behind the programme, said: 'The most important conclusion of this work is that, when introduced with a large collection of paintings and sculptures, the algorithm can successfully highlight paintings that is considered creative - original and influential.

'The algorithm achieved that without any knowledge about art or art history encoded in its input.

'In most cases the results of the algorithm are pieces of art that art historians indeed highlight as innovative and influential.

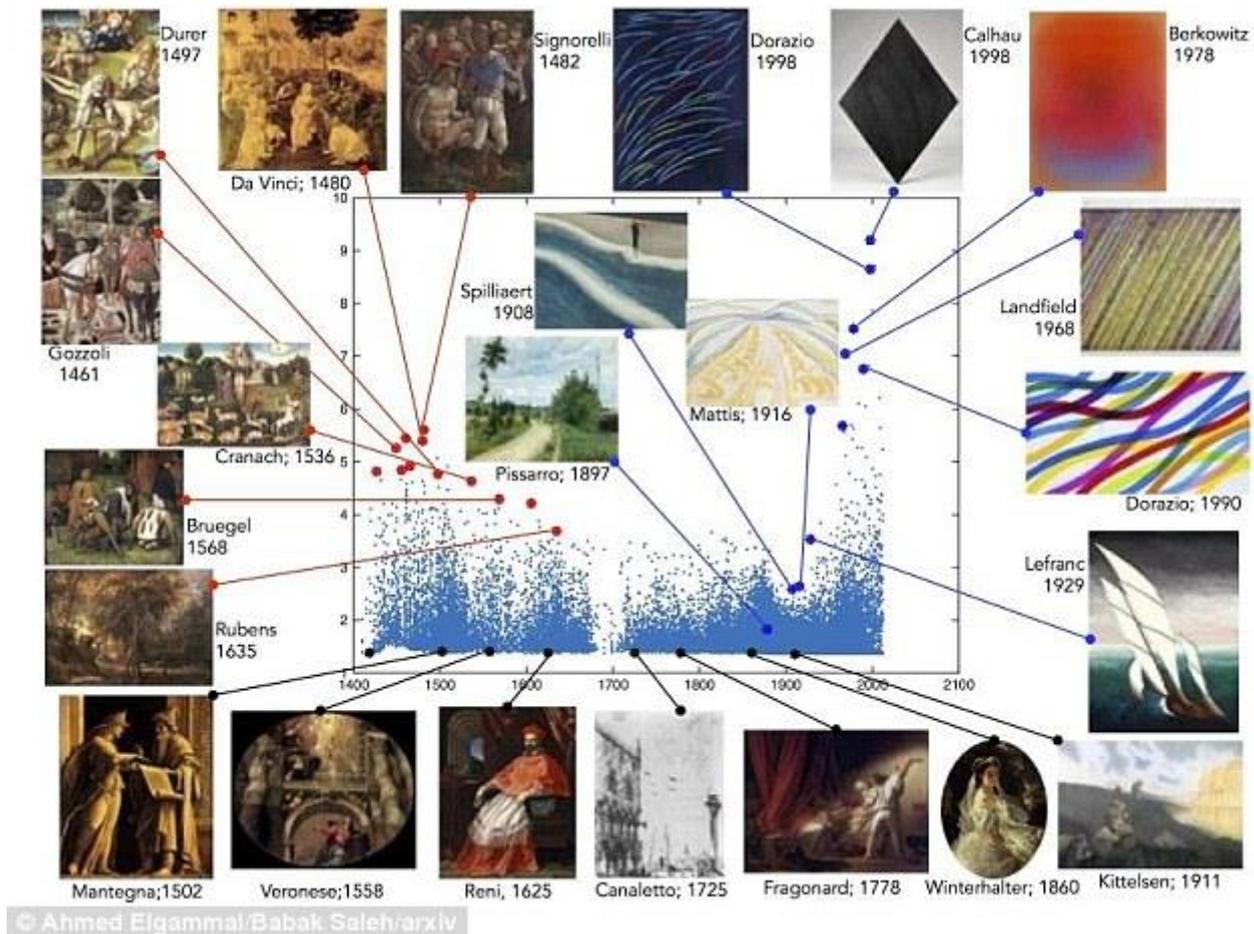


Norwegian expressionist Edvard Munch's scream, shown above, was ranked as one of the most creative paintings ever produced by the computer algorithm. It sold for \$120 million when it was auctioned in 2012



This graph shows the creativity scores of paintings between 1850 and 1950. Artists like Van Gogh, Picasso and Malevich rank highly while some of Cezanne's work scored less well in terms of creativity

'The algorithm achieved this assessment by visual analysis of paintings and considering their dates only.'
 The researchers also found art shows peaks in creativity around the late 15th to early 16th century at the time of the High Renaissance period and in the late 19th and early 20th century.
 There was also a significant increase in creativity in the second half of the 20th century.
 They used the computer algorithm to examine art stored in the Wikiart online database.
 They also applied the programme to specific types of paintings to see if it could distinguish particular genres and spot creativity.



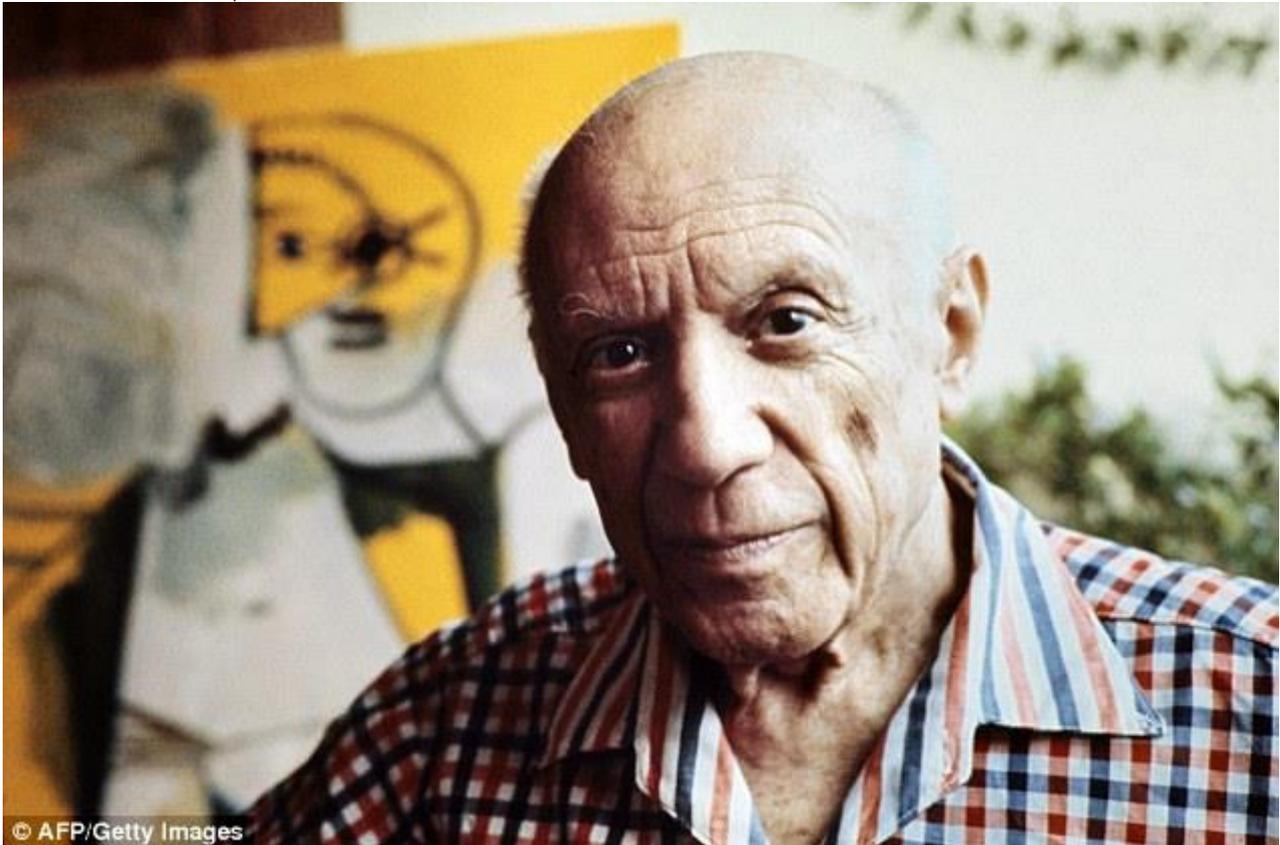
This analysis of 62,000 paintings from the Wikiart database shows works by Da Vinci scoring highly but more abstract pieces from the late 20th Century by Dorazio, Calhau and Landfield get the highest creativity scores
 When looking at religious paintings specifically, they found that artists like Francisco Goya and Salvador Dali produced particularly creative works of art.
 Hans Holbein the Younger, the 15th century artist who painted for Henry VIII, however, ranked poorly for some of his paintings like Madonna and Child Enthroned with Two Saints, while his The Body of the Dead Christ in the Tomb was seen as being highly creative.
 Perhaps surprisingly, Marc Chagall was awarded the highest score for creativity by the computer programme among the religious artists.
 The researchers said that while they analysed paintings with their algorithm, similar computer frameworks could be applied to sculpture, literature and science.

'This painting is considered as the second iconic figure after Leonardo's Mona Lisa in the history of art, and it is known to be the most-reproduced painting in the twentieth century.

'It is also one of the most outstanding expressionist paintings.

'We can see that Picasso's La Celestina (1903) scored the highest among his blue-period paintings. Picasso's Ladies of Avignon (1907) sticks out as high in creativity and obtained the highest score between 1904-1911.

'Art historians indicate that the flat picture plane and the application of primitivism in this painting made it an innovative work of art, which lead to Picasso's cubism.



Spanish painter Pablo Picasso is one of the most influential artists from the 20th century. His paintings were consistently rated as being highly creative by the algorithm designed by researchers at Rutgers University

'We can notice a sharp increase in creativity scores at 1912, dominated by cubism work, with Picasso's Maquette for Guitar (1912) is the highest scoring in that surge.

'The up trend in creativity scores continues with several of Kasimir Malevich's first Suprematism paintings in 1915 topping the scores.

'The majority of the top-scoring paintings between 1916 and 1945 were by Piet Mondrian and Georgia O'Keeffe.'

Dr Elgammal added that the findings showed the promise of artificial intelligence.

He said: 'The ultimate goal of the AI research is to make machines that have perceptual, cognitive, and intellectual abilities similar to those of humans.

'We believe that judging creativity is a challenging task that combines these three abilities.

'Our results offer an important breakthrough: proof that a machine can perceive, visually analyze, and reason to discover original and influential paintings throughout the history.'

Read more: <http://www.dailymail.co.uk/sciencetech/article-3126302/Move-art-critics-Computer-algorithm-reveals-original-masterpieces-time.html#ixzz3s8DM52uZ>

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