Tales about the century of physics and a millennium of art

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The 20th century is often referred to as the century of physics. From x-rays to the semiconductor industry, the human society today would indeed be very different were it not for the progress made in physics laboratories around the world. The information provided in the digitized content of over half a million publications that were published by the American Physical Society during the past century can be used to quantify trends of progress, and to identify the most influential scientific breakthroughs. Our research reveals that the emergence of scientific memes can be attributed to the Matthew effect, and that their inheritance in citation networks is similar to the propagation of successful genes through generations of human societies [1,2]. What the past 100 years have been for science, the past millennium has been for the arts. From the late Byzantine and Islamic art to Renaissance, Realism and Pop art, the past 1000 years are packed with the most productive periods of our creative existence. The availability of digitized visual artworks allows us to perform large-scale quantitative analysis of the history of art. We have, to that effect, analyzed almost 140,000 visual artworks, the majority of which were paintings, by more than 2,300 artists created between 1031-2016. Based on the complexity and entropy of spatial patterns in the artworks (see figure), we were able to hierarchically categorize the artworks on a scale of order-disorder and simplicity-complexity, ultimately revealing a clear temporal evolution of the artworks that coincides with the main historical periods of art [3].

References

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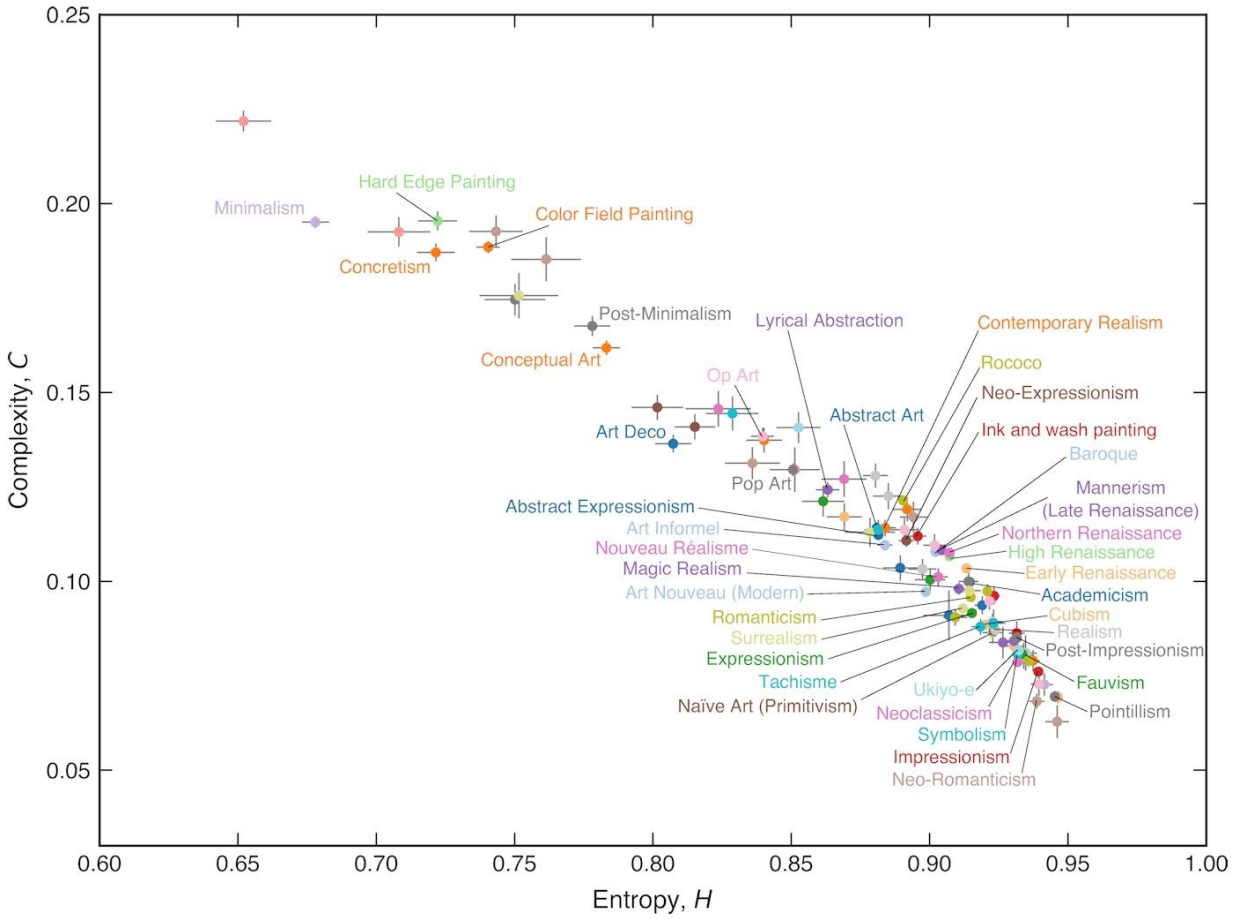

Different artistic styles on the complexity-entropy plane. The colorful dots represent the average values of H and C for each one of the 92 styles with more than 100 images in the dataset. Only 41 artistic styles with more than 500 images each are labeled for clarity.