

Matjaž Perc

Matjaž Perc is Full Professor in the Physics Department at the Faculty of Natural Sciences and Mathematics of the University of Maribor. He is conducting research in the field of physics of complex systems, with an emphasis on the theoretical description of human cooperation, on the problems of strong reciprocity and defection of the second order, and on the development of subsystem stability analysis of agent-based models for the study of social models. Through his research work, which has been presented in 300 scientific articles, he has helped establish the physics of social systems and paved the way for researchers from all over the world for the application of statistical physics on key problems of today's society. With over 20,000 citations, he is the most-cited natural scientist in Slovenia. In 2014, he was in the top 1% of the most cited physicists in the world, and in 2018 in the top 1% of the most cited interdisciplinary researchers in the world. In 2015, he received the prestigious award from the German Physical Society for best researcher in the fields of socio- and econophysics, and in 2017, he was named the USERN Laureate for his outstanding research serving the humanity, an award bestowed on him by a commission of 14 Nobel laureates. Apart from his outstanding research work, Matjaž Perc is also an editorial board member at several prestigious physical and interdisciplinary journals. He is a regular member of Academia Europaea and the European Academy of Sciences and Arts and he works as a reviewer for the European Research Council and the National Science Foundation of the United States of America.

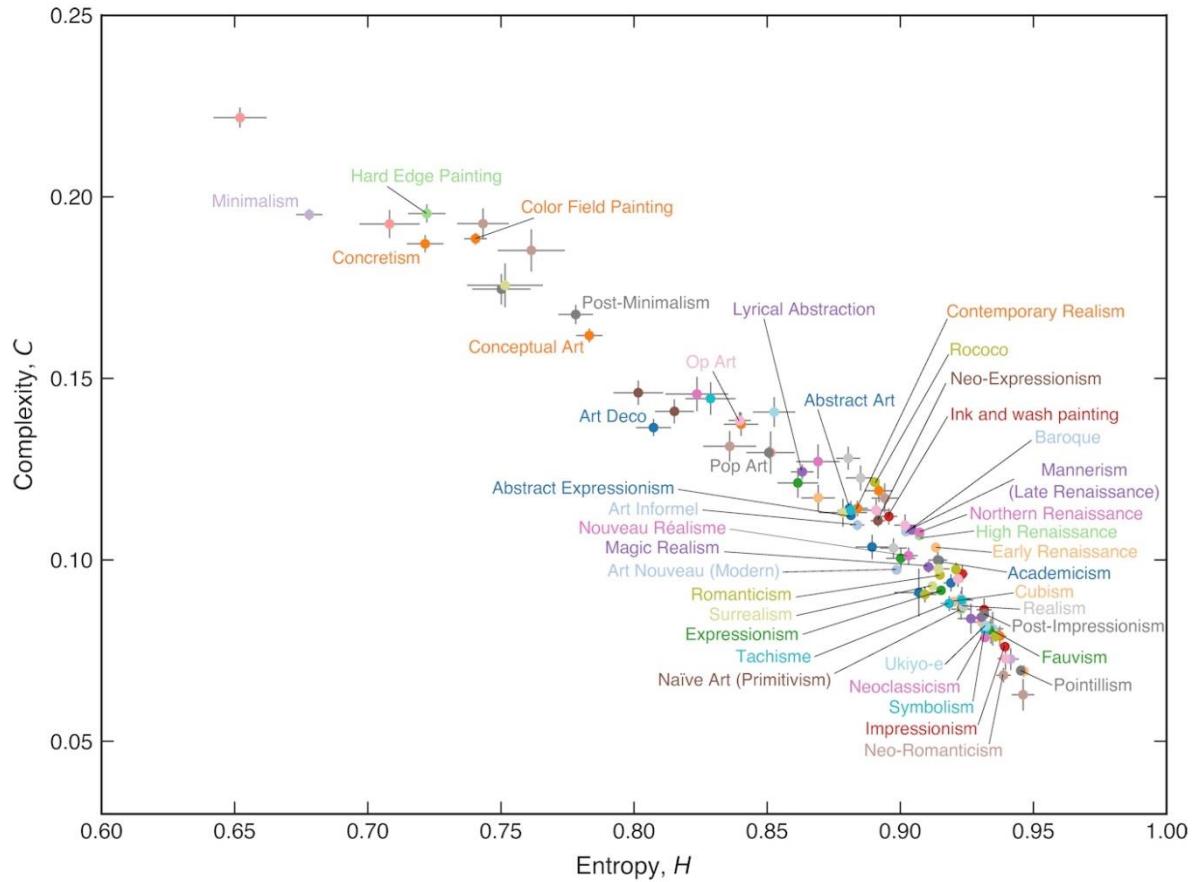
Millennium of Art Paintings Through the Lens of Physics

The 20th century is often described as the century of physics. In truth, the human society today would be significantly different were it not for the fundamental research breakthroughs in physics labs all over the world [1, 2]. What the past hundred years meant for physics, the past thousand years meant for art paintings. The last millennium saw the rise of some of the most prolific art periods in human existence, from the Byzantine art and Renaissance to Realism and Pop art. Mass digitalization of art paintings today enables us to perform a precise quantitative analysis of the history of art paintings on a very large temporal and spatial scale. I will present a study [3], in which we analysed more than 140,000 paintings created by more than 2,300 artists between 1031 and 2016. Based on the complexity and entropy of spatial patterns in the paintings we managed to hierarchically categorize the paintings in a two-dimensional space of order-disorder and simplicity-complexity (see figure below), revealing the temporal development of the history of art paintings, which corresponds to the most important art periods of the last millennium. The study indicates the next step in the analysis of mass databases where we are moving away from textual semantics [4] and closer to the quantification of subjective properties of works, such as aesthetics and appeal.

References

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Different art styles in the space of complexity (C) and entropy (H). The coloured circles represent the average values of H and C for all 41 styles with more than 500 artworks in our database.