

Software generation of images using mathematics

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I use my software developed in the Visual Basic programming language to generate images. An algorithmic approach is used, which enables a high level of diversity of results with relatively short but mathematically supported software solutions. At each point of the image, a programming algorithm is executed, consisting of mathematical formulas that enter pieces of information, which are constant for the current cycle (genetic code) and variables generated by the process itself. The result of the calculation is the color of the point or the position where to remove the color from the color palette, which plays the role of a key variable. The image coordinate system, the Cartesian and polar coordinate system, and the logic of the complex plane are used to control the image. The whole process is supported by a time-determined random number generator, which supplies the system with random values of various parameters and thus ensures unpredictability and non-repetition of the results. From the viewpoint of mathematics, the following notions appear in the algorithms: complex algebraic expressions, trigonometric and logarithmic functions, plane geometry, iterations and recursions, determination of random numbers in areas, conversion of coordinates between different coordinate systems, control of stochastic motion of a point in plane and space, circular and spiral movements, computation with complex numbers, original formulas for various calculations, number sequences (Fibonacci) and other mathematical operations. The resulting paintings are of the abstract type, which for the most part do not show their mathematical provenance and approach fine art.