

## An Introduction to Polynomiography

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Polynomiography is defined as “the art and science of visualization in approximation of zeros of complex polynomials, via fractal and non-fractal images created using the mathematical convergence properties of an infinite family of iteration functions.” An individual image is called a “polynomiograph.” Polynomiographs are obtained using new algorithms for the computation of polynomial roots and are a by-product of more than a decade of research on this fundamental, historically influential, and ancient problem. Some academicians may claim that the polynomial root-finding problem is “completely exhausted,” or that “Newton's method is all that is needed.” Polynomiography puts such claims to rest. From the artistic point of view polynomiography may well develop into a new art form. Working with polynomiography is analogous to working with a camera or playing a musical instrument. With practice one can learn to produce the most exquisite and complex patterns through polynomiography. From the design point of view polynomiography can be used for all sorts of surface design: decorative fabrics, textiles, carpets, animation, and much more. From the pedagogical perspective, polynomiography is a powerful tool for visualization of certain mathematical concepts, properties, or theorems (e.g. the Fundamental Theorem of Algebra) at every level, from K – 12 to the most sophisticated scientific investigation.

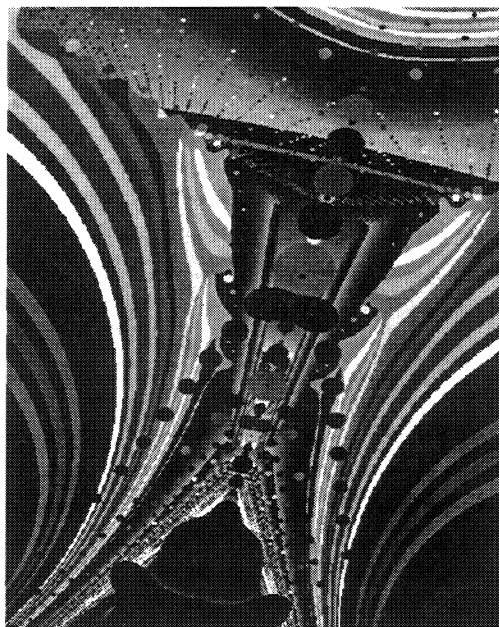


Figure 1: A sample polynomiograph called, “Circus.”