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Gregg Helt* (gregghelt@gmail.com). *Mandelboxen: mathematical extensions to the artistic toolkit for 2D and 3D Mandelbox fractals.*

The Mandelbox is a recently discovered class of escape-time fractals that use a conditional combination of reflection, spherical inversion, scaling, and translation to transform a point under iteration. Although most artistic explorations of the Mandelbox have focused on 3D versions, it can be generated in any number of dimensions. In this presentation we first review existing Mandelbox variants, then introduce new data visualization techniques to help explore versions of the 2D Mandelbox. We then propose several new extensions to the 2D Mandelbox. Perhaps most intriguing is the introduction of shape inversion (or pseudoinversion) as a substitute for spherical inversion. Shape inversion generalizes standard spherical inversion to other shapes, and although shape inversions are not conformal transformations, they preserve many other properties of spherical inversion. We further explore applying shape inversion and other new extensions to the 3D Mandelbox. Source code for the presented work is freely available on GitHub. (Received September 27, 2017)